DRAFT BASIC ASSESSMENT REPORT

for

ROAN 2 PV

On

Portions 4,5,9 and 16 of the farm 299 and Grid connection on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

In terms of the

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

Prepared for Applicant: AMDA November (Pty) Ltd.

Date: 29 April 2022

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Report Reference: CML715/05

Department Reference: 2022-01-0003 (Pre-Application Reference)

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APPROVAL FOR RELEASE

NAME	TITLE	SIGNATURE
Dale Holder	Senior Environmental Practitioner	

DISTRIBUTION

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AMDA November (Pty) Ltd
Registered and Potential Interested and Affected Parties

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APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONER:
Cape EAPrac Environmental Assessment Practitioners PO Box 2070 George 6530 Tel: 044-874 0365 Fax: 044-874 0432 **Report written & compiled by:** Dale Holder (Ndip Nature Conservation), who has over 16 years' experience as an environmental practitioner. **Registrations:** Director, Louise-Mari van Zyl (MA Geography & Environmental Science [US]; Registered Environmental Assessment Practitioner with the Interim Certification Board for Environmental Assessment Practitioners of South Africa, EAPSA). Ms van Zyl has over fifteen years' experience as an environmental practitioner.

PURPOSE OF THIS REPORT:
I&AP Review and Comment

APPLICANT:
AMDA November (Pty) Ltd

CAPE EAPRAC REFERENCE NO:
CML715/05

DEPARTMENT REFERENCE:
2022-01-0003 (Pre-Application Reference)

SUBMISSION DATE:
29 April 2022

DRAFT BASIC ASSESSMENT REPORT

in terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) & Environmental Impact Regulations2014 (as amended)

Roan 2 PV

Portions 4,5,9 and 16 of the farm 299 and Grid connection on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

Submitted for:

Stakeholder Review & Comment

Report Issued by:

Cape Environmental Assessment Practitioners

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REPORT DETAILS

Title:	Draft Basic Assessment Report for Roan 2 PV
Purpose of this report:	This Draft Basic Assessment Report is made available to all registered and potential Interested and Affected Parties (I&APs) for review and comment and all comments received will be incorporated into the Final Basic Assessment Report that will be submitted to the competent authority for decision making. This BAR forms part of a series of reports and information sources that are being provided during the Basic Assessment Process for the proposed Roan 2 PV near Haartbeesfontein in the North West Province. Registered I&APs will be given an opportunity to comment on the following reports as part of this environmental process: - Draft Basic Assessment Report, - All Specialist Studies, and - Draft Environmental Management Programme. In accordance with the regulations, the objectives of an environmental process are to, through a consultative process: (a)identify the relevant policies and legislation relevant to the activity; (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location; (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process; (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment; (e) identify the key issues to be addressed in the assessment phase; (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and (g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored. The Draft Basic Assessment Report is available to all registered and potential interested and affected parties for a 30-day review and comment period extending from **03 May 2022 – 06 June 2022**. All comments received during this comment period will be incorporated into the Final BAR that will be submitted to the DFFE for Decision making.
Prepared for:	AMDA November (Pty) Ltd
Published by:	Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)
Authors:	Mr Dale Holder
Cape EAPrac Ref:	CML715/05
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TECHNICAL CHECKLIST

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

Applicant Details		
Applicant Details	Applicant Name:	AMDA November (Pty) Ltd AMDA November (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 Portions 4,5,9 and 16 of the farm 299. Grid connection infrastructure is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338 .
	Company Registration Number:	2019/040395/07
	BBBEE Status:	NA
	Project Name:	Roan 2 PV
Site Details		
Size of the property	Description and Size in hectares of the affected property.	PV facility and PV facility and associated infrastructure is situated on Portions 4,5,9 and 16 of the farm 299. Approximately 363ha (approximate combined size of portions 4,5,9 and 16 of Farm 299) Grid connection infrastructure is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338
Size of the study area	Size in ha of initial study area.	Approximately 363ha (The entire combined farm portions formed part of the study site)
Development Footprint	This includes the total footprint of PV panels, auxiliary buildings, onsite substation, inverter stations and internal roads.	Approx. 193 hectares.
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	• Solar photovoltaic (PV) technology (monofacial or bifacial) with fixed, single or double axis tracking mounting structures, as well as associated infrastructure, which will include: • Laydown areas; • Access and Internal Road network; • Auxiliary buildings (33 kV switch room, gatehouse and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.); • Facility substation; • Inverter-stations, transformers and internal electrical reticulation (underground cabling); • Battery Energy Storage System (BESS); • Rainwater Tanks; and • Perimeter fencing and security infrastructure. • Powerline from of up to 132kV to the existing Eskom Roan substation.

	Structure height	Solar panels with a maximum height of ± 5.5 m above the ground
	Surface area to be covered (including associated infrastructure such as roads)	Approximately 193 ha
	Structure orientation	Fixed-tilt: north-facing at a defined angle of tilt Single or double axis tracking: mounted in a north-south orientation, tracking from east to west.
	Laydown area dimensions	Approximately 2-5 ha laydown area will be required for the PV facility (the laydown areas will not exceed 5 ha and will be situated within the assessed footprint).
Storage Solution	BESS	Battery Energy Storage System (BESS). Area: up to ± 1 ha Capacity: Unspecified Technology: solid-state/ non-liquid type batteries.
Grid Connection		
	Size and capacity of on-site substation	Eskom side and Facility Side substation with a footprint, not exceeding 1ha
	Length and capacity of on-site powerlines / cabling.	Grid connection between the Eskom side of the on-site substation and the existing Eskom Roan Substation via a single or double circuit overhead powerline up to 132 kV, within a 100m wide corridor and up to 4.5 km long The facility will include inverter-stations, transformers, switchgear and internal electrical reticulation (underground cabling) and lightning conductors up to 21 m.
Auxiliary Infrastructure		
Other infrastructure	Additional Infrastructure	Auxiliary buildings of no more than 1 ha, including (but not limited to) a 33 kV switch room, a gate house, ablutions, workshops, storage and warehousing areas, site offices and a control centre. Rainwater 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. The access road will comprise of a new road, as well as the expansion of sections of the existing farm road.
	Details of internal roads	A network of gravel internal access roads, each with a width of up to ± 5 m, will be constructed to provide access to the various components of the facility.
	Extent of areas required for laydown of materials and equipment	Approximately 2-5 ha of temporary laydown areas will be required (laydown areas will not exceed 5 ha). A permanent laydown area of a maximum of a 1 ha will remain for operations.

The Applicant, AMDA November (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as Roan 2 PV) located on Portions 4,5,9 and 16 of the farm 299 located approximately 3km south of Haartbeesfontein in the North West Province. The application includes a Grid connection solution to connect the proposed facility to the existing Eskom Roan Substation. The Grid connection infrastructure is also situated on on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

The project is situated within a Renewable Energy Development Zone (REDZ) known as the Klerksdorp REDZ (REDZ10). The solar PV facility will comprise or arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the City of Matlosana Local Municipality within the Dr Kenneth Kaunda District Municipality of the North-West Province of South Africa.

An additional 120MW MW PV facility known as Roan 1 PV and its associated grid connection is concurrently being assessed through a separate Basic Assessment processes.

A preliminary assessment area of approximately 363ha was assessed by the EAP and participating specialists. All specialists assessed the full 363 hectares and provided spatial data of site sensitivities and no-go areas and buffers. A preferred alternative (Layout Alternative 1) was then developed taking into account the sensitive features / landscapes.

Roan 2 PV will have a maximum development footprint of 193 hectares.

The Roan 2 PV facility will have a contracted capacity of up to 120 MW and will include the following:

- Solar Field consisting of Solar arrays with a maximum height of 5.5m and associated infrastructure including:
    - PV modules (monofacial or bifacial modules and polycrystalline, monocrystalline or thin film Technology);
    - Mounting structures (with fixed, single or double axis tracking technology);
    - Mounting Foundations (concrete block, ground screw, ground bolt, concrete pile or driven steel pile foundations);
    - Internal Road Network up to 7m wide;
    - Low voltage and medium cables (installed underground or in cable trays)
- Building Infrastructure with a maximum footprint of 2ha including:
    - Offices;
    - Operations and Maintenance building;
    - Warehouse/workshop;
    - Ablution Facilities;
    - Guard House; and
    - Battery Energy Storage System consisting of solid state batteries with a maximum footprint of 1ha.
- One substation/switching station up to 132kv(with a footprint of up to 1ha including:
    - The Eskom Portion of the substation;
    - The IPP Portion of the substation;
    - All associated electrical infrastructure for the Eskom and IPP Portions of the Substation;
    - Lightning protection system; and
    - Control room
- Grid connection between the Eskom side of the on-site substation and the existing Eskom Roan Substation via a single or double circuit overhead powerline up to 132 kV, within a 100m wide corridor and up to 4.5 km long.
- Centralised or String Inverters and transformers
- Main Access Road x 4. each up to 10m wide
- Up to three Temporary laydown areas with a maximum combined footprint of up to 4.5ha. PV modules may be installed on temporary laydown areas after use. A permanent laydown of no more than 1ha may remain for operations.
- Underground or overhead MV Cabling between the PV Arrays.
- Perimeter fencing up to 2.5m high around the facility.
- Perimeter road / fire break of up to 3m wide
- Stormwater management infrastructure.
- Additional feeder bay at the existing Eskom Roan substation.

LOCATION OF PREFFERED ALTERNATIVE[1]

The co-ordinates of the preferred alternative are reflected in the table below.[2]

Roan 2 PV	Latitude	Longitude
North-West Corner	26°48'51.85"S	26°24'24.05"E
North-East Corner	26°48'55.39"S	26°25'15.54"E
South-West Corner	26°50'05.38"S	26°25'18.65"E
South-East Corner	26°50'10.70"S	26°26'00.23"E

Access Road 1	Latitude	Longitude
Start	26°48'42.65"S	26°25'16.11"E
Middle	26°48'50.07"S	26°25'15.58"E
End	26°48'57.10"S	26°25'13.30"E

Access Road 2	Latitude	Longitude
Start	26°48'44.42"S	26°24'55.75"E
Middle	26°48'45.92"S	26°24'55.98"E
End	26°48'47.40"S	26°24'56.01"E

Access Road 3	Latitude	Longitude
Start	26°49'36.63"S	26°25'26.50"E
Middle	26°49'34.14"S	26°25'23.62"E
End	26°49'34.67"S	26°25'19.10"E

Access Road 4	Latitude	Longitude
Start	26°49'36.63"S	26°25'26.50"E
Middle	26°49'37.69"S	26°25'28.07"E
End	26°49'38.94"S	26°25'33.65"E

Powerline Corridor[3]	Latitude	Longitude
Start	26°49'01.66"S	26°25'13.18"E
Middle	26°48'36.43"S	26°26'26.11"E
End[4]	26°48'48.21"S	26°27'26.36"E

Substations	Latitude	Longitude
Roan 2 PV Substation[5]	26°49'01.66"S	26°25'13.18"E

[1] The footprint of Roan 2 PV is not rectangular. The co-ordinates reflected in this table indicate the corner points that are furthest east and west.

[3] The powerline is assessed as a 200m wide corridor and the co-ordinates reflected in this table indicate the approximate centreline of this corridor.

[4] This co-ordinate depicts the approximate center point of the existing Roan 1 Substation.

[5] This co-ordinate depicts the center point of the on site substation (i.e. the approximate divide between the ESKOM and the IPP portions of the substation.)

CONTENTS OF A BASIC ASSESSMENT REPORT.

Appendix 1 of Regulation 326 of the 2014 EIA Regulations (as amended) contains the required contents of a Basic Assessment Report. The checklist below serves as a summary of how these requirements were incorporated into this Basic Assessment Report.

Requirement	Details
(1) A basic 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 report was compiled by Dale Holder of Cape EAPrac. The author has 18 years' experience as an EAP and holds a ND Nature Conservation qualification. The CV of the EAP and Company Profile is included as Annexure J4 of this report.
(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.	C0090000000033700000 ±12 km South of Hartbeesfontein in the North West Province North-West Corner 26°48'51.85"S 26°24'24.05"E North-East Corner 26°48'55.39"S 26°25'15.54"E South-West Corner 26°50'05.38"S 26°25'18.65"E South-East Corner 26°50'10.70"S 26°26'00.23"E
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Refer to Appendix A and B of this report.
(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 activities to be undertaken including associated structures and infrastructure.	The relevant listed activities are captured in Section 3.1.2 The description of the activity is provided in Section 2 of this report with graphic representation provided in Appendix B.
(e) A description of the policy and legislative context within which the development is proposed, including – An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and . How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments.	Please refer to Section 3 of this document.
(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.	Please refer to Section 2.2 of this document.
(g) A motivation for the preferred site, activity and technology alternative.	

Requirement	Details
	The preferred alternative has been identified as the best practicable option and is discussed in detail in section 2.4 of this report.
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - • Details of all 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 alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; • The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated. • The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; • 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; • The outcome of the site selection matrix; • If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and • A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 2.4 addresses feasible and reasonable alternatives which were identified for facility. Site, layout and technological alternatives were considered. Details of Public Participation are included in section 8 of the report. A summary of all issues raised by I&APs as well as the responses thereto are included in Appendix F. The environmental attributes of the study site are included in section 5 of the report. The identification and assessment of Impacts are included in section 6 of the report. The summary of proposed mitigation measures is included in section 7 of the report. The outcome of the site selection matrix is attached in Annexure E7 and is summarised in section 2.3 of the report. The concluding statement is contained in section 6.14 of the report.
(i) A full description of the process undertaken to identify, assess and rank the impacts the activity 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 basic 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.	Please see Summary and Section 6 of the report and Appendix E for the specialist reports.
(j) An assessment of each identified potentially significant impact and risk, including - 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	Please see Section F of the report and Appendix E for the specialist reports.

Requirement	Details
The degree to which the impact and risk can be mitigated.	
(k) Where applicable, a summary of the findings and impact management measures identified in 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.	Please see Section 6 of the report and Appendix E for the specialist reports.
(l) An environmental impact statement which contains – • 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.	Section 6.23 and 6.14 of this report. See Appendix D Section 6.13 of this report.
(m) Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	See section 7 report.
(n) 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.	See section 7 of this report.
(o) A description of assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	See 3.4 of this report.
(p) 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.	See section 9 of this report.
(q) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	The proposed activity does include operational aspects.
(r) An undertaking under oath or affirmation by the EAP in relation to: The correctness of the information provided in the reports; The inclusion of comments and inputs rom 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.	The declaration of the EAP is attached in Appendix G.
(s) Where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.	This environmental assessment does not include application for decommissioning and closure of activities
(t) Any specific information that may be required by the competent authority.	Currently not applicable but will be included if such a request is made.

Requirement	Details
(u) Any other matters required in terms of section 24(4)(a) and (b) of the Act.	This section will be updated on receipt of the mandatory comment from the competent authority.

COMPETANT AUTHORITY COMMENT ON DRAFT BASIC ASSESSMENT REPORT

This section will be updated once the DFFE provide comment on the Draft Basic Assessment Report.

ORDER OF REPORT

Report Summary

Draft Basic Assessment Report – Main Report

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Appendix D	:	Solar Facility Layout Plans
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Annexure E3	:	Avifaunal Impact Assessment (Van Rooyen, 2022)
Annexure E4	:	Agricultural Impact Assessment Report (Lanz, 2022)
Annexure E5	:	Heritage Impact Assessment Report (Beyond Heritage, 2022)
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EXECUTIVE SUMMARY

I. INTRODUCTION

Cape EAPrac has been appointed by AMDA November (Pty) Ltd, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment process[6] required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the Roan 2 PV facility on Portions 4,5,9 and 16 of the farm 299 near Haartbeesfontein in the North West Province of South Africa.

The total generation capacity of the solar facility will not exceed 120 MW_{AC} for input into the national Eskom grid. The project will feed into the National Grid via the existing Roan Eskom Substation. The grid connection to connect this project to the National Grid is being assessed as part of this same environmental assessment process[7]. The Grid connection infrastructure is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

The purpose of this **Draft Basic Assessment Report** (BAR) is to describe the environment to be affected, the proposed project, to present the site constraints identified by the various specialist during their site assessments and identify & assess the impacts of this development on the receiving environment. This information is herewith presented to all registered and potential Interested and Affected Parties (I&AP's), organs of state, state departments and the competent authority for review and comment. The public participation process has been undertaken in compliance with the approved public participation plan as attached in Annexure F6.

In compliance with Chapter 6 of the 2014 EIA regulations (as amended), Draft BAR is available for a 30 - Day period extending from **03 May 2022 – 06 June 2022.**

All comments received on the Draft BAR will be incorporated into the Final BAR that will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for consideration and decision making. After the department has taken a decision on the application, this decision will be communicated to all registered I&AP's along with details of the appeal process.

II. RECOMMENDATION OF THIS EIA

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 and the proposed grid connection corridor be considered for 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.

Please refer to sections 6,7 and 9 of this Draft BAR for the justification of this recommendation.

III. NEED AND DESIRABILITY

Need and desirability for this project has been considered in detail in this environmental process. The overall need and desirability in terms of developing renewable energy generation in South Africa, the North West Province and globally is considered in section 1, while the project specific need and desirability is considered in section 2.8 of this report.

[6] The environmental process follows a basic assessment process, as it is located within the Klerksdorp Renewable Energy Development Zone.

[7] This Basic Assessment Report therefore includes the IPP side of the onsite substation, the Eskom side of the onsite substation as well as the overhead powerline to the Eskom Roan Substation.

IV. ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

The current assessment is being undertaken in terms of the **National Environmental Management Act** (NEMA, Act 107 of 1998). 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 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 Basic Assessment Process, which must be conducted by an independent Environmental Assessment Practitioner (EAP). Cape EAPrac has been appointed to undertake this process.

Table 1: NEMA 2014 (As amended) listed activities applicable to Roan 2 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 as well on site substations and an overhead powerline with a capacity of up to 132 kilovolts.
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 roads to Roan 2 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 Roan 2 PV development is considered to be commercial use and the total footprint size will exceed 1 hectare.
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 main road will be widened by more than 6m in some places.
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 Roan 2 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 Roan 2 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;	Portions of Roan 2 PV fall within a CBA identified in the North West Province Biodiversity Sector Plan. The internal roads of Roan 2 PV occur within this CBA.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
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 Roan 2 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 v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	A portion of Roan 2 PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Roan 2 PV occur within this CBA.

NOTE: Basic Assessment (BA) as well as Scoping and Environmental Impact Reporting (S&EIR) Activities are being triggered by the proposed development, but since the project is contained in a legislated REDZ, the EIA Process will follow a Basic Assessment process.

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

V. DEVELOPMENT PROPOSAL

The Applicant, AMDA November (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as Roan 2 PV) located on Portions 4,5,9 and 16 of the farm 299 located approximately 3km south of Haartbeesfontein in the North West Province. The application includes a Grid connection solution to connect the proposed facility to the existing Eskom Roan Substation. The Grid connection infrastructure is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

The project is situated within a Renewable Energy Development Zone (REDZ) known as the Klerksdorp REDZ (REDZ10). The solar PV facility will comprise or arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the City of Matlosana Local Municipality within the Dr Kenneth Kaunda District Municipality of the North-West Province of South Africa.

An additional 120MW MW PV facility known as Roan 1 PV and its associated grid connection is concurrently being assessed through a separate Basic Assessment processes.

A preliminary assessment area of approximately 363ha was assessed by the EAP and participating specialists. All specialists assessed the full 363 hectares and provided spatial data of site sensitivities and no-go areas and buffers. A preferred alternative (Layout Alternative 1) was then developed taking into account the sensitive features / landscapes.

Roan 2 PV will have a maximum development footprint of 193 hectares.

The Roan 2 PV facility will have a contracted capacity of up to 120 MW and will include the following:

- Solar Field consisting of Solar arrays with a maximum height of 5.5m and associated infrastructure including:
    - PV modules (monofacial or bifacial modules and polycrystalline, monocrystalline or thin film Technology);
    - Mounting structures (with fixed, single or double axis tracking technology);

  - Mounting Foundations (concrete block, ground screw, ground bolt, concrete pile or driven steel pile foundations);
  - Internal Road Network up to 7m wide;
  - Low voltage and medium cables (installed underground or in cable trays)
- Building Infrastructure with a maximum footprint of 2ha including:
  - Offices;
  - Operations and Maintenance building;
  - Warehouse/workshop;
  - Ablution Facilities;
  - Guard House; and
  - Battery Energy Storage System consisting of solid state batteries with a maximum footprint of 1ha.
- One substation/switching station up to 132kv(with a footprint of up to 1ha including:
  - The Eskom Portion of the substation;
  - The IPP Portion of the substation;
  - All associated electrical infrastructure for the Eskom and IPP Portions of the Substation;
  - Lightning protection system; and
  - Control room
- Grid connection between the Eskom side of the on-site substation and the existing Eskom Roan Substation via a single or double circuit overhead powerline up to 132 kV, within a 100m wide corridor and up to 4.5 km long.
- Centralised or String Inverters and transformers
- Main Access Road x 4. each up to 10m wide
- Up to three Temporary laydown areas with a maximum combined footprint of up to 4.5ha. PV modules may be installed on temporary laydown areas after use. A permanent laydown of no more than 1ha may remain for operations.
- Underground or overhead MV Cabling between the PV Arrays.
- Perimeter fencing up to 2.5m high around the facility.
- Perimeter road / fire break of up to 3m wide
- Stormwater management infrastructure.
- Additional feeder bay at the existing Eskom Roan substation.

VI. PROFFESIONAL INPUT

The following professionals[8] have provided input into this environmental process:

1.	Terrestrial Biodiversity	-	Anthene Ecolocial Cc
2.	Avifaunal	-	Chris van Rooyen Consulting
3.	Heritage	-	Beyond Heritage
4.	Archaeology	-	Beyond Heritage
5.	Palaeontology	-	Prof Marion Bamford
6.	Agricultural Potential	-	Mr Johann Lanz
7.	Visual	-	Visual Resource Management Africa
8.	Aquatic Biodiversity	-	Anthene Ecolocial Cc
9.	Social	-	Savannah Environmental
10.	Engineering aspects	-	AMDA Developments (Pty) Ltd

[8] 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

11. Stormwater - JG Afrika
12. Traffic and Transportation - JG Afrika

VII. PLANNING CONTEXT

The land use planning process will involve the following:

- Application for consent use in terms of the Spatial Planning and Land Use Management Act, Act 16 of 2013, submitted to the City of Matlosana Local Municipality, in terms of the Standard Zoning Scheme By-law, 2020.

In terms of the Standard Zoning Scheme By-law, 2020 a renewable energy structure is permitted as a consent use of Agricultural 1 Zoned land.

VIII. ASSESSMENT OF IMPACTS

This section simply lists the potential key potential impacts that were identified and assessed by the various specialists (more details on the significance and ratings of these impacts are provided in section 6.4 – 6.11 below and in the specialist reports attached in Appendix E).

Terrestrial Biodiversity Impacts Assessed

Construction Phase Impacts

- Loss of habitat owing to the removal of vegetation at the proposed development.
- Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of connectivity and conservation corridor networks in the landscape.
- Contamination of soil during construction in particular by hydrocarbon spills.
- Killing of vertebrate fauna during the construction phase.

Operational Phase Impacts

- An increased infestation of exotic or alien invasive plant species owing to disturbance.

Decommissioning Phase Impacts

The decommissioning phase impacts are deemed to be the same as the construction phase impacts and will include:

- Loss of habitat owing to the removal of vegetation at the proposed development.
- Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of connectivity and conservation corridor networks in the landscape.
- Contamination of soil during construction in particular by hydrocarbon spills.
- Killing of vertebrate fauna during the construction phase.

Agricultural Impacts Assessed

- Loss of agricultural potential by occupation of land.
- Loss of agricultural potential by soil degradation
- Enhanced agricultural potential through increased financial security for farming operations.
- Improved security against stock theft and other crime due to the presence of security infrastructure and security personal at the facility.

Avifaunal Impacts Assessed

Construction Phase Avifaunal Impacts

- Displacement due to disturbance and habitat transformation associated with the construction of the solar PV plant and associated infrastructure.

Operational Phase Avifaunal Impacts

- Collisions with the solar panels
- Entrapment in perimeter fences
- Electrocutions in the onsite substations
- Collisions with the 132kV grid connection

Decommissioning Phase Avifaunal Impacts

- Displacement due to disturbance associated with the decommissioning of the solar PV plant and associated infrastructure.

Aquatic Biodiversity Impacts Assessed

Construction Phase Aquatic Biodiversity Impacts

- Loss of riparian habitat owing to the removal of vegetation at the proposed footprint for development.
- Changes in flow regime.
- Exposure of soil leading to soil compaction and/ or erosion.
- Loss of sensitive wetland/ riparian species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of riparian connectivity and conservation corridor networks in the landscape.
- Contamination of riparian soil during construction in particular by hydrocarbon spills.
- Contamination of habitat by littering and dumping of rubble/ construction material.
- Poor recovery of soils that were exposed and compacted during the construction phase.

Operational Phase Aquatic Biodiversity Impacts

- An increased infestation of exotic or alien invasive plant species owing to disturbances associated with the proposed development.
- Poor recovery of soils that were exposed and compacted during the construction phase.

Decommissioning Phase Aquatic Biodiversity Impacts

The decommissioning impacts are deemed to be similar to those outlined for the construction phase.

Heritage Impacts Assessed

- Impact on the Stone cairn - R001
- Impact on the Stone Age site RB002.
- Impact on the dwelling ruin at R003
- Impact the Stone Age scatter RB004

Visual Impacts Assessed

Construction Phase Visual Impacts:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

Operational Phase Visual Impacts

- Massing effect in the landscape from a large-scale modification.
- Soil erosion.
- Windblown dust..

Decommissioning phase Visual Impacts

- Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations.
- Wind-blown dust from impacts to vegetation.
- Wind-blown litter from the laydown and deconstruction sites

Traffic Impacts Assessed

Construction phase Traffic Impacts

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching for electrical cables and other ancillary construction works that will temporarily generate the most traffic.

Operational phase Traffic Impacts

The traffic generated during the operational phase will be minimal and will not have an impact on the surrounding road network.

Cumulative Traffic Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

Social Impacts Assessed

Construction Phase Social Impacts

- Direct and indirect employment opportunities
- Economic multiplier effects
- Influx of jobseekers and change in population
- Safety and security impacts
- Impacts on daily living and movement patterns
- Nuisance impacts, including noise and dust
- Visual impacts and sense of place impacts

Operational Phase Social Impacts

- Direct and indirect employment opportunities
- Development of non-polluting, renewable energy infrastructure
- Contribution to Local Economic Development (LED) and social upliftment
- Visual and sense of place impacts
- Impacts associated with the loss of agricultural land

IX. IMPACT SUMMARY

The table below summarises the significance (with mitigation) of all impacts assessed in the sections above[9].

For ease of easy references, impacts are visually reflected using the following colour scheme[10].

All positive impacts (regardless of their significance)	
Neutral or Negligible negative impacts	

[9] In order to attain these outcomes, the mitigation measures reflected in section 7 of the report need to be implemented.

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

Very Low and Low negative impacts

Moderate and Moderate – High negative impacts

High and Very High negative impacts

Table 2: Summary of the significance of impacts associated with Roan 2 PV [11].

Impact	Significance / Status
Construction Phase Terrestrial Biodiversity Impacts	
Loss of habitat owing to the removal of vegetation at the proposed development.	Moderate Negative
Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.	Low Negative
Loss of connectivity and conservation corridor networks in the landscape.	Low Negative
Contamination of soil during construction in particular by hydrocarbon spills.	Low Negative
Killing of vertebrate fauna during the construction phase.	Low Negative
Operational Phase Terrestrial Biodiversity Impacts	
An increased infestation of exotic or alien invasive plant species owing to clearance or disturbance where the footprint took place.	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts	
Loss of habitat owing to the removal of vegetation at the proposed development.	Moderate Negative
Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the decommissioning phase.	Low Negative
Loss of connectivity and conservation corridor networks in the landscape.	Low Negative
Contamination of soil during construction in particular by hydrocarbon spills.	Low Negative
Killing of vertebrate fauna during the decommissioning phase.	Low Negative
Agricultural Impacts – all phases.	
Loss of agricultural potential by occupation of land	Low Negative
Loss of agricultural potential by soil degradation	Low Negative
Dust impact	Low Negative
Enhanced agricultural potential through increased financial security for farming operations (positive impact)	Low Positive
Visual Impacts during the construction phase	
Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.	Medium – Low Negative
Wind-blown dust due to the removal of large areas of vegetation.	Medium - Low Negative
Possible soil erosion from temporary roads crossing drainage lines.	Medium – Low Negative
Wind-blown litter from the laydown and construction sites.	Medium – Low negative
Visual Impacts during the operational phase	
Massing effect in the landscape from a large-scale modification.	Medium Negative
Soil erosion.	Medium Negative
Windblown dust	Medium Negative
Visual Impacts during the decommissioning phase	
Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations.	Low Negative
Wind-blown dust from impacts to vegetation	Low Negative
Wind-blown litter from the laydown and deconstruction sites	Low Negative
Construction Phase Aquatic Risks	
Clearing of vegetation at proposed footprint in preparation for construction and during construction.	Low Negative
Moving vehicles and working of machinery and equipment at bridge crossings and extra strip for manoeuvring.	Low Negative
Vehicles and machinery could leak which then result in spilling of hydrocarbons	Low Negative
Waste or building rubble are generated during the construction phase.	Low Negative
Creating access road(s) to construction area.	Low Negative

[11] This includes cumulative impacts associated with the facility

Impact	Significance / Status
Operational Phase Aquatic Risks	
Cleared areas where alien invasive plant species establish..	Low Negative
Compacted and exposed soils do not recover easily without rehabilitation	Low Negative
Construction Phase Social Impacts	
Direct and indirect employment opportunities	Medium Positive
Economic multiplier effects	Medium Positive
Influx of jobseekers and change in population	Low Negative
Safety and security impacts	Low Negative
Impacts on daily living and movement patterns	Medium Negative
Nuisance impacts, including noise and dust	Low Negative
Visual impacts and sense of place impacts	Low Negative
Operational Phase Social Impacts	
Direct and indirect employment opportunities	Medium Positive
Development of non-polluting, renewable energy infrastructure	Medium Positive
Contribution to Local Economic Development (LED) and social upliftment	Medium Positive
Visual and sense of place impacts	Low Negative
Impacts associated with the loss of agricultural land	Low Negative
Construction Phase Avifaunal Impacts.	
Displacement of priority species due to disturbance and habitat transformation associated with construction of the PV plant and associated infrastructure	High
Operational Phase Avifaunal Impacts.	
Mortality of priority species due to collisions with solar panels	Very Low Negative
Entrapment of birds in the perimeter fence	Low Negative
Mortality of priority species due to electrocution in the onsite substations	Low Negative
Mortality of priority species due to collisions with the 132kV OHL	Low Negative
Decommissioning Phase Avifaunal Impacts.	
Displacement of priority species due to disturbance associated with decommissioning of the PV plant and associated infrastructure.	Medium Negative
Construction Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust	Low
Noise pollution due to increased traffic	Low
Operational Phase Traffic Impacts.	
The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.	Absent
Decomissioning Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust.	Low
Noise pollution due to increased traffic.	Low
Impacts on identified Heritage Features	
Impact on the Stone cairn - R001	Low
Impact on the Stone Age site RB002.	Low
Impact on the dwelling ruin at R003	Low
Impact the Stone Age scatter RB004	Low

X. IMPACT STATEMENT

The majority of impacts range from high positive to medium negative with the exception of a single high impact associated with the potential displacement of an avifaunal species of conservation concern. The avifaunal specialist did however confirm that the habitat on site is marginal for this species and confirmed the risk not to constitute a fatal flaw.

All high, very high and critical negative impacts have been avoided by the avoidance of sensitive features or have been mitigated to acceptable levels via the risk adverse approach to the development outlined in section 2.23 and 2.24 of this report.

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 1) avoids the main sensitive features, (most notably, non perennial rivers, Ridges, avifaunal buffers, stormwater management areas and the viewshed from the existing Renosterberg Safari main accommodation).

The affected area is therefore considered suitable for development and there are no impacts associated with Roan 2 PV that cannot be mitigated to an acceptable level. With the enhancement measures suggested by the Social Specialist, high positive impacts on Creation of employment and business opportunities, Economic Multiplier effects, Generation income for affected landowner and Cumulative impact on local economies can be expected.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the preferred alternative in this assessment (Layout Alternative 1), Roan 2 PV and its associated short grid connections can be supported from a terrestrial biodiversity, Aquatic biodiversity, avifaunal, visual, social, heritage (inclusive of Archaeology, Cultural Landscape and Palaeontology), 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..

Please refer to the table in the section above listing the key impacts and their significance post mitigation for the preferred alternative. This section must be read in conjunction with the suggested mitigation measures listed in section 7 of this Report.

XI. 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 Basic Assessment 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 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 BAR 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 BAR that will be submitted to DFFE for decision making.

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 and the proposed grid connection corridor be considered for 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 BASIC ASSESSENT REPORT

1 INTRODUCTION

Cape EAPrac has been appointed by AMDA November (Pty) Ltd, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment process[12] required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the Roan 2 PV facility on Portions 4,5,9 and 16 of the farm 299 near Haartbeesfontein in the North West Province of South Africa.

The total generation capacity of the solar facility will not exceed 120 MW_{AC} for input into the national Eskom grid. The project will feed into the National Grid via the existing Roan Eskom Substation. The grid connection to connect this project to the National Grid is being assessed as part of this same environmental assessment process[13]. The Grid connection infrastructure is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

The purpose of this **Draft Basic Assessment Report** (BAR) is to describe the environment to be affected, the proposed project, to present the site constraints identified by the various specialist during their site assessments and identify & assess the impacts of this development on the receiving environment. This information is herewith presented to all registered and potential Interested and Affected Parties (I&AP's), organs of state, state departments and the competent authority for review and comment. The public participation process has been undertaken in compliance with the approved public participation plan as attached in Annexure F6.

In compliance with Chapter 6 of the 2014 EIA regulations (as amended), Draft BAR is available for a 30 - Day period extending from **29 April 2022 – 03 June 2022.**

All comments received on the Draft BAR will be incorporated into the Final BAR that will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for consideration and decision making. After the department has taken a decision on the application, this decision will be communicated to all registered I&AP's along with details of the appeal process.

1.1 RECOMMENDATION OF THIS EIA

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 and the proposed grid connection corridor be considered for 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.

1.2 OVERVIEW OF ALTERNATIVE ENERGY IN SOUTH AFRICA AND THE NORTH WEST PROVINCE [14]

The section below provides an overview of the potential benefits associated with the renewable energy sector in South Africa. Given that South Africa supports the development of renewable energy at national

[12] The environmental process follows a basic assessment process, as it is located within the Klerksdorp Renewable Energy Development Zone.

[13] This Basic Assessment Report therefore includes the IPP side of the onsite substation, the Eskom side of the onsite substation as well as the overhead powerline to the Eskom Roan Substation.

[14] This section has been prepared with input from the social specialist.

level, the intention is not to provide a critical review of renewable energy. The focus is therefore on the contribution of renewable energy, specifically in terms of supporting economic development.

The Renewable Energy Independent Power Producers Procurement Programmes (REIPPPP)[15] primary mandate is to secure electrical energy from the private from renewable energy sources.

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.

By the end of June 2020, the REIPPPP had made the following significant impacts in terms of energy supply:

- 6 422 MW of electricity had been procured from 112 Renewable Energy 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.
- 49 461 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013.

Renewable energy IPPs have proved to be very reliable. Of the 68 projects that have reached COD, 64 projects have been operational for longer than a year. The energy generated over the past 12-month period for these 64 projects is 11 079 GWh, which is 93% of their annual energy contribution projections (P50) of 11 882 GWh over a 12-month delivery period. Twenty-eight (24) of the 64 projects (38%) have individually exceeded their P50 projections.

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.

The document notes that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has attracted significant investment in the development of the REIPPs into the country. The total investment (total project costs[16]), including interest during construction, of projects under construction and projects in the process of closure is R209.7 billion (this includes total debt and equity of R209.2 billion, as well as early revenue and VAT facility of R0.5 billion).

To date, the REIPPPP has attracted R41.8 billion in foreign investment and financing in the seven bid windows.

The REIPPPP also contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. In this regard, Black South Africans own, on average, 33% of projects that have reached financial close (BW1-BW4), which is 3% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or near their communities and represents the majority share of total South African Entity Participation.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 21% shareholding by black people in engineering, procurement, and construction (EPC) contractors has been attained for projects that have reached

[15] It is proposed that the Roan 2 PV will form part of the REIPPPP

[16] Total project costs means the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation, and or commissioning of the project)

financial closure. This is higher than 20% target. The shareholding by black people in operating companies of IPPs has averaged 24% (against the targeted 20%) for the 68 projects in operation (i.e. in BW1–4).

To date, a total of 52 603 job years[17] have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. These job years should rise further past the planned target as more projects enter the construction phase. Employment opportunities across all five active bid windows are 126% of the planned number during the construction phase (i.e. 33 707 job years), with 23 projects still in construction and employing people. The number of employment opportunities is therefore likely to continue to grow beyond the original expectations. By the end of June 2020, 68 projects had successfully completed construction and moved into operation. These projects created 33 449 job years of employment, compared to the anticipated 23 619. This was 42% more than planned.

The emission reductions for the programme during the preceding 12 months (June 2019-June 2020) is calculated as 11.5 million tonnes CO2 (MtonCO2) based on the 1 1313 GWh energy that has been generated and supplied to the grid over this period. This represents 56% of the total projected annual emission reductions (20.5MtonCO2) achieved with only partial operations. A total of 50.2 Mton CO2 equivalent reduction has been realised from programme inception to date.

The Green Jobs Study notes that South Africa has one of the most carbon-intensive economies in the world, therefore making the greening of the electricity mix a national imperative. Within this context the study notes that the green economy could be an extremely important trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century.

The REIPPPP introduced in 2011, has by all accounts been highly successful in quickly and efficiently delivering clean energy to the grid. Increasingly competitive bidding rounds have led to substantial price reductions.

A 20-year sovereign guarantee on the power purchase agreement (PPA) and, especially, ideal solar power conditions, have driven the investment case for Renewable Energy in South Africa. In this regard South Africa has been identified as one of the worlds' leading clean energy investment destinations

[17] The equivalent of a full-time employment opportunity for one person for one year

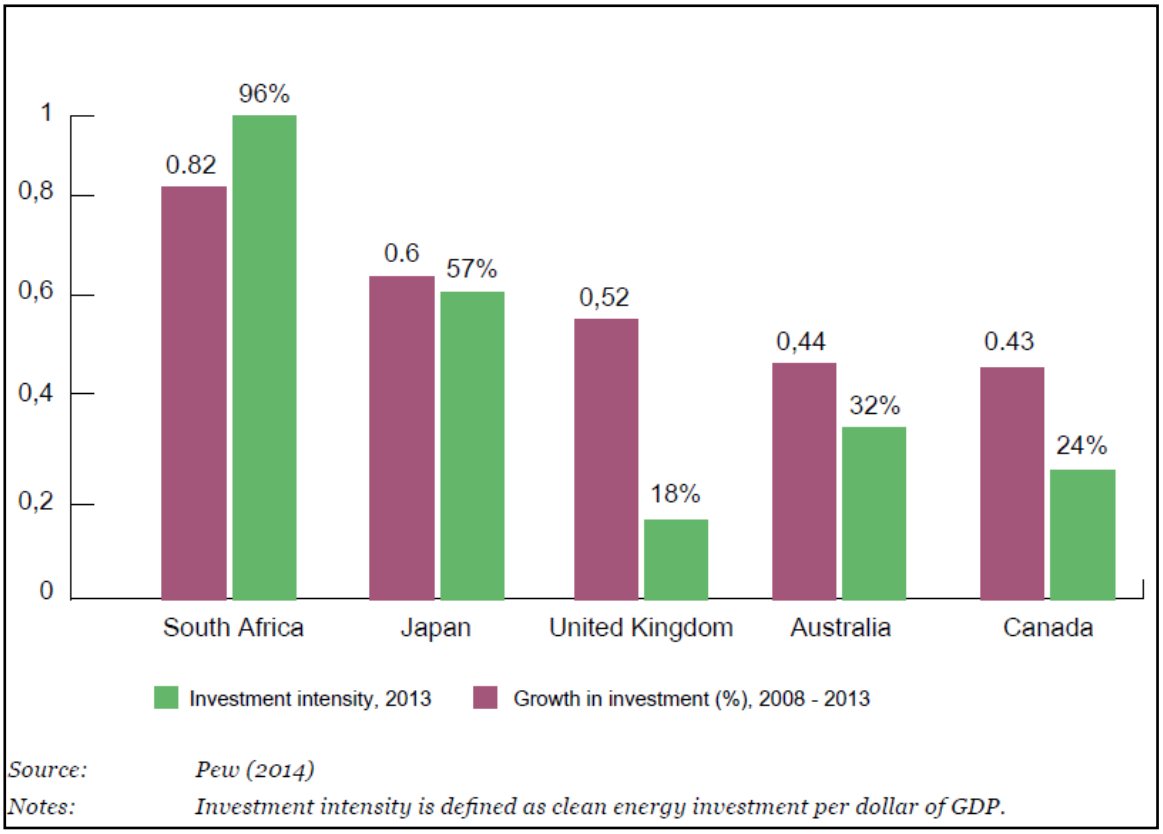

Figure 1: South Africa as a global lead clean energy investment destination

With regard to local economic development, the REIPPPP sets out various local economic development requirements with stipulated minimum threshold and aspirational targeted levels, which each bidder must comply with. Based on the Broad-Based Black Economic Empowerment Codes, this requirement comprises the following components which make up a scorecard:

- Ownership by black people and local communities,
- Job creation,
- Local content,
- Management control,
- Preferential procurement,
- Enterprise development, and
- Socio-economic development.

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, most notably the local Spatial Development Plan as well as the Klerksdorp REDZ, 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 will be implemented in order to ensure minimal negative impacts and maximum environmental benefits.
- It is assumed that due consideration will be given to the **discrepancies in the digital mapping** (PV panel array layouts against possible constraints), caused by differing software programs, and that it is understood that the ultimate/final positioning of solar array will only be confirmed on-site with the relevant specialist/s.
- 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 at this stage is made that water provision for construction and operations 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 BAR to be timeously submitted to the competent authority, the Department of Forestry, Fisheries and the Environment, for consideration and decision making.

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

2. PROPOSED ACTIVITY

The Applicant, AMDA November (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as Roan 2 PV) located on Portions 4,5,9 and 16 of the farm 299 located approximately 3km south of Haartbeesfontein in the North West Province. The application includes a Grid connection solution to connect the proposed facility to the existing Eskom Roan Substation. The Grid connection is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

The project is situated within a Renewable Energy Development Zone (REDZ) known as the Klerksdorp REDZ (REDZ10). The solar PV facility will comprise or arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the City of Matlosana Local Municipality within the Dr Kenneth Kaunda District Municipality of the North-West Province of South Africa.

An additional 120MW MW PV facility known as Roan 1 PV and its associated grid connection is concurrently being assessed through a separate Basic Assessment processes.

A preliminary assessment area of approximately 363ha was assessed by the EAP and participating specialists. All specialists assessed the full 363 hectares and provided spatial data of site sensitivities and no-go areas and buffers. A preferred alternative (Layout Alternative 1) was then developed taking into account the sensitive features / landscapes.

Roan 2 PV will have a maximum development footprint of 193 hectares.

The Roan 2 PV facility will have a contracted capacity of up to 120 MW and will include the following:

- Solar Field consisting of Solar arrays with a maximum height of 5.5m and associated infrastructure including:
    - PV modules (monofacial or bifacial modules and polycrystalline, monocrystalline or thin film Technology);
    - Mounting structures (with fixed, single or double axis tracking technology);
    - Mounting Foundations (concrete block, ground screw, ground bolt, concrete pile or driven steel pile foundations);
    - Internal Road Network up to 7m wide;

  - Low voltage and medium cables (installed underground or in cable trays)
- Building Infrastructure with a maximum footprint of 2ha including:
  - Offices;
  - Operations and Maintenance building;
  - Warehouse/workshop;
  - Ablution Facilities;
  - Guard House; and
  - Battery Energy Storage System consisting of solid state batteries with a maximum footprint of 1ha.
- One substation/switching station up to 132kv(with a footprint of up to 1ha including:
  - The Eskom Portion of the substation;
  - The IPP Portion of the substation;
  - All associated electrical infrastructure for the Eskom and IPP Portions of the Substation;
  - Lightning protection system; and
  - Control room
- Grid connection between the Eskom side of the on-site substation and the existing Eskom Roan Substation via a single or double circuit overhead powerline up to 132 kV, within a 100m wide corridor and up to 4.5 km long.
- Centralised or String Inverters and transformers
- Main Access Road x 4. each up to 10m wide
- Up to three Temporary laydown areas with a maximum combined footprint of up to 4.5ha. PV modules may be installed on temporary laydown areas after use. A permanent laydown of no more than 1ha may remain for operations.
- Underground or overhead MV Cabling between the PV Arrays.
- Perimeter fencing up to 2.5m high around the facility.
- Perimeter road / fire break of up to 3m wide
- Stormwater management infrastructure.
- Additional feeder bay at the existing Eskom Roan substation.

Figure 2: Proposed layout of Roan 2 PV, showing key project components (Please also refer to the full-scale plans attached in Appendix D).

Roan 2 PV will have a net generating capacity of 120 MW with an estimated maximum footprint of ± 193 ha.

According the Technical Design Report, attached in Annexure E9, the following key components will form part of the proposed Roan 2 PV development.

2.1 GENERAL LAYOUT DESIGN CRITERIA

The choice of the technology or more specifically, the PV module and tracker or rack structure is the chief determinant in the layout of the PV plant. Fixed rack structures, single and two axis trackers all have different spatial requirements.

An optimised layout or spatial arrangement of the solar field is prepared based on the performance criteria and spatial requirements of the preferred equipment choices above taking into account the further design criteria listed below.

- 16 m from the centre of any power lines, either they are single power lines or double power lines
- 95 m from the centre of provincial roads (a relaxation to a lesser distance can be sought)
- 16 m to any Telkom line

- A minimum distance of 10 m to the perimeter fence to prevent theft and avoid shadows cast by the fence
- Internal and perimeter service roads of 3m surface width and 5m reserve width
- A main access road with a 10 m reserve width

2.2 FOUNDATIONS

A geotechnical study will be carried out in order to provide data for the selection of the foundation. Depending on the structure or tracker that is selected, the following foundation options may be considered.

- Mass concrete block foundation
- Ground screw foundation
- Ground bolt foundation
- Concrete pile foundation
- Vibratory driven steel pile foundation

For fixed or rack structures, either driven steel piles or small concrete footings are cast in the ground for the foundations. These concrete foundations are typically of the same size as for small buildings.

The **preferred technology for trackers is the vibratory driven steel pile foundation**, however given the hard ground conditions expected on the site, a steel pile in concrete in a predrilled hole is the more likely foundation solution. A concrete pile may be used.

2.3 STRUCTURES

In order to support the PV modules, a steel structure must be used. There are different options which will be considered: a fixed or rack structure, a 1-axis tracker (horizontal, vertical or polar axis) and a 2-axis tracker. The current trend is towards rack structures or horizontal single axis trackers because of the superior production rates and cost effectiveness.

There are numerous rack and tracker manufacturers in the market, many with proprietary technology and the system chosen will depend on the proposals by the EPC Contractors.

The materials commonly used in support and tracker structures are:

- Galvanized steel
- Stainless steel
- Anodized aluminium

The impact on agricultural resources and production of these options are considered to be the same, 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. Roan 2 PV will therefore aim to make the most use of predrilling and backfilling of holes prior to 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 3: 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 4: 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 5: 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 6: Completed ramming and assembly showing vegetation remaining intact beneath the modules.

Figure 7: Showing vegetation re-establishing along the driplines of the arrays within weeks after installation.

2.3.1 Fixed or rack structures

A typical rack or fixed structure will usually have two rows of 25 -30 modules (2 strings). The modules are placed in portrait arrangement. The foundation technology is usually a direct-driven (rammed) installation, with a ramming depth subject to the soil characteristics.

Figure 8: Photographic example of rack or fixed structure (AMDA Developments, 2022)

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

2.3.2 Single-axis trackers

With a typical horizontal single-axis tracker the PV modules are attached to beams on the rotating structure. A number of these beams are placed adjacent and parallel to each other and driven by a common rotation mechanism. This allows for a modular design with each tracker module having a single central motor and a number of tracker arms. This simplifies design and allows for an extremely efficient use of space.

The system produces more output than rack structures yet still has extremely low energy consumption.

Precision electronics with GPS input and proprietary positioning algorithms ensure that the PV modules are positioned at an optimum angle to the sun at all times.

Figure 9: Example of STI-Norland tracker (AMDA Developments, 2022)

2.4 PV MODULES

There are various types of PV modules defined according to the materials and technology used:

- Si-Monocrystalline
- Si-Polycrystalline
- Thin Film
- High Concentrated

There are also a wide range of PV module manufacturers in the market. Currently the trend for utility scale facilities such as this is towards polycrystalline module technology.

In the REIPPPP an important bid criteria is local content and the use of locally manufactured or assembled PV modules to help the local economy, local job creation and the local communities.

The EPC Contractor establishes rigorous quality control procedures for the PV modules suppliers. These procedures are applied from the source of the supply, as well as during the entire supply chain.

Since the environmental impact of the various PV module alternatives will be the same, for the purpose of the EIA, all of the abovementioned film technology alternatives are under investigation and are considered to be reasonable and feasible alternatives.

2.5 INVERTERS

There are various types of inverters defined according to their technology. The inverter will be selected on the basis of making the most of its rated power according to the manufacturer specifications and the power to be installed in each site. The choice of inverter depends on the performance of the PV module chosen (type and model) and the size (capacity).

The number of inverters to be used is determined in a design optimisation process where there is a trade-off between fewer large capacity inverters or more lower capacity inverters widely distributed across the solar field. Typically there would be about 26-30 inverters used in a 120MW PV project.

2.6 CONCENTRATOR BOXES

The concentrator boxes are outdoor switchgear boxes or cabinets where the electrical wires from the tracker or rack group are collected. The concentrator boxes are designed for outdoor conditions and are mounted on a concrete base.

2.7 TRANSFORMATION CENTRE MT: POWER BLOCK

The transformation centre will be a concrete or steel prefabricated structure built to house the transformer and the associated protection devices and the Central Inverter. In the transformer, voltage level will be transformed from 0.65 kV to 33 kV.

The number of transformers to be used is determined in a design optimisation process where there is a trade-off between fewer large capacity transformers or more lower capacity transformers widely distributed across the solar field. Typically there would be about 26 - 30 transformers used in a 120MW PV project.

2.8 DISTRIBUTION CENTRE

The distribution centre is where all the medium voltage lines coming from the various transformers are collected. The distribution centre also houses the meters used to measure the electricity produced and exported to the grid. The distribution centre is housed in a prefabricated or a steel structure and a MV line runs from here to the collector sub-station and from there to the Eskom substation.

2.9 ELECTRICAL RETICULATION

The electrical reticulation within the PV plant, from the trackers or racks through to the distribution centre will all be underground.

The electrical reticulation will comprise of a Direct Current (DC) component from the PV modules to the inverters and an Alternating Current (AC) component from the inverters to the Eskom connection.

Typically, the DC cabling is based on pre-assembled harnesses from each string-end connection up to the concentrator boxes. The harnesses incorporate a first-level overcurrent protection by means of properly sized line- fuses. The DC cable will be in full compliance with IEC and SANS standards, with single layer of XLP insulation, 90º temperature rating (wet or dry), suited for direct burial installation, rated for 1kV and UV resistant.

Typically, the cables will be sized to ensure a maximum 1.5% voltage drop between PV modules and inverters.

Typically the AC-MV cable will be in full compliance with IEC, SANS and NRS Standards, with stranded aluminium conductor, triple extruded insulation system and high dielectric strength 22kV insulation. The MV cables will be suited for direct burial, for operation at 105°C continuous, 140°C in emergency and 250°C in short-circuit.

2.10 HV SUBSTATION

The onsite Switching station/ Substation will locate the main power transformer/s that will step up the generated electricity to a suitable voltage level -132kV- for transmission into the national electricity grid, via the OH line.

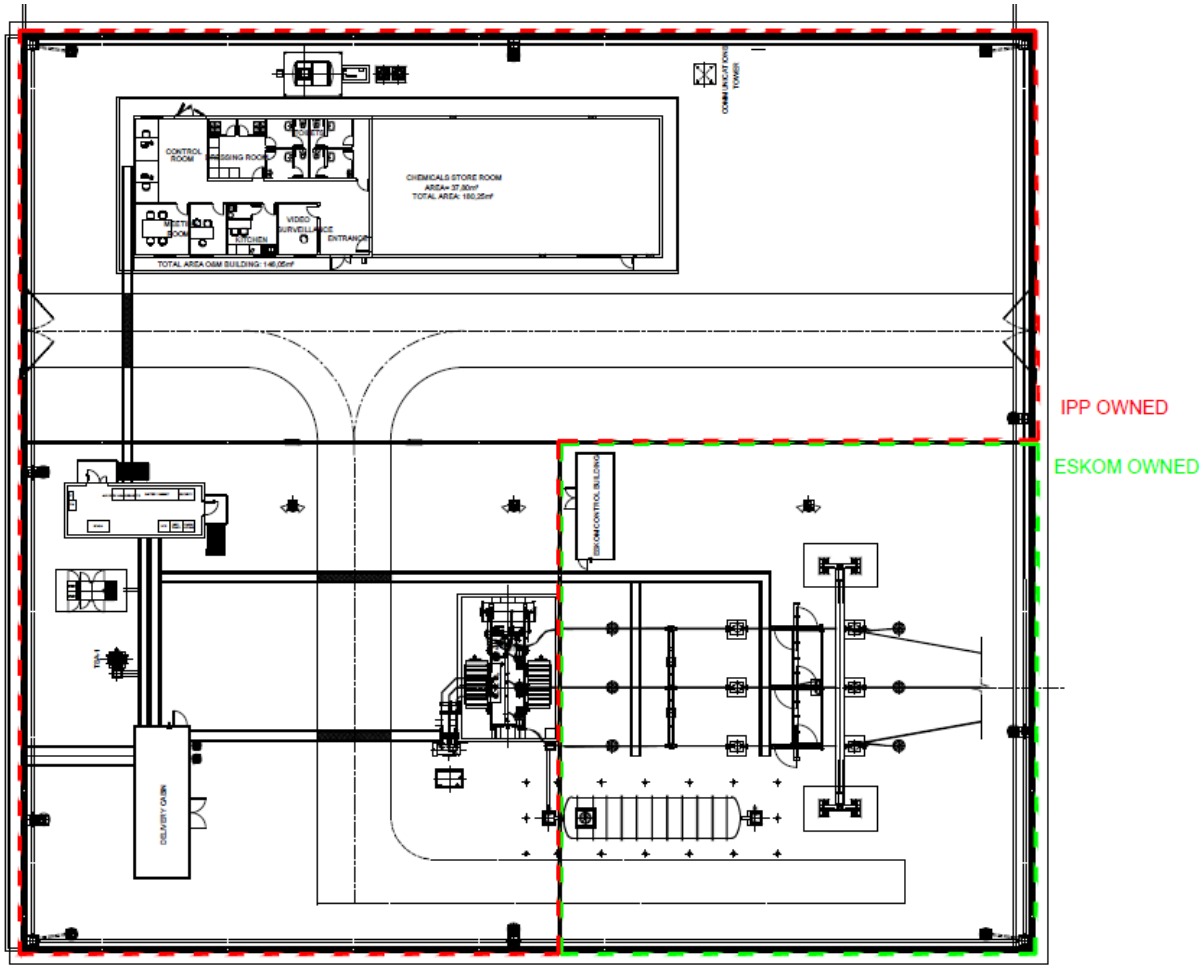

Figure 10: Proposed layout of the HV substation showing the Eskom and IPP owned portions (AMDA Developments, 2022).

2.11 EVACUATION LINE

The electricity from the PV power plant will be evacuated via a 132kV overhead line to the existing Eskom Roan sub-station on the land parcel adjacent to the site and from there into the Eskom grid. The exact specification of the line will be determined by the Eskom grid connection requirements and the line will be designed and built to Eskom's standards. Should both Roan projects be successful a collector substation will be built on Roan 2 PV and both projects will connect into this collector, from there a 132kV line will then carry the stepped up electricity into the Roan Substation.

The alignment of the evacuation line will be determined by the proposed grid connection point and any environmental sensitivities between the PV power plant and the grid connection point. The EIA will assess the evacuation line as a corridor, rather than a static line.

Figure 11: Showing the Grid connection corridor as assessed for Roan 2 PV.

Please refer to Appendix A and D for full scale plans depicting the proposed Grid Connection Corridor.

Figure 12: Existing Eskom Roan Substation to which the project will connect.

2.12 LIGHTNING PROTECTION SYSTEM

To protect the PV plant, equipment and personnel from lightning strikes a lightning protection system composed of masts and surges arresters will be installed. This system will be designed by a specialist and will comply with the South African laws and standards.

Although current lightening protection designs only allow for low height protection on the individual structures, provision has been made in the applications for 15m high conductor masts.

2.13 AUXILIARY POWER SUPPLY

The PV plant requires a continuous power supply for the operation of the plant. This is for the plant monitoring and control systems, the perimeter and security systems, lights and air-conditioning etc for the buildings. Also if trackers are used, a small supply is required for the operation for the trackers.

The most cost effective and efficient source is for the auxiliary power supply is usually directly from the Eskom sub-station. An 11kV supply line will be brought from the Eskom sub-station back to the project site within the assessed powerline corridor.

2.14 EMERGENCY POWER SUPPLY

In order to ensure the continuous operation of the monitoring system and security a backup diesel generator system, with at least 2 hours of autonomy, is usually installed.

2.15 MONITORING & CONTROL SYSTEMS

A SCADA (Supervisory Control And Data Acquisition) system will be installed. The primary purpose of SCADA is to monitor, control and alarm plant or regional operating systems from a central location. While override control is possible, it is infrequently utilized.

There are three main elements to a SCADA system, various RTU's (Remote Telemetry Units), communications and an HMI (Human Machine Interface).

Each RTU effectively collects information at a site, such as from the inverters or met station, while communications bring that information from the various plant or regional RTU sites to a central location, and occasionally returns instructions to the RTU.

The HMI displays this information in an easily understood graphics form, archives the data received, transmits alarms and permits operator control as required. The HMI is essentially a PC system running powerful graphic and alarm software programs.

Communication within a plant will be by data cable, wire or fibre-optic, while regional systems most commonly utilize radio or the internet. The real time information can be monitored remotely, typically by the O&M company and the plant owners etc.

2.16 MET STATIONS

There will be a number of meteorological stations installed on the site in order provide adequate meteorological data to evaluate the PV plant performance. The typical meteorological station will include all or some of the following items:

- Lattice structure 3m high for the support of the systems
- pyranometer for tilted radiation
- horizontal pyranometer for global radiation
- ambient temperature sensor with natural ventilation antiradiant shield
- anemometer at 5m height
- a vane to measure the wind direction
- module temperature sensor
- humidity sensor
- data logger
- GSM/GPRS modem
- UPS or non-stop power supply system

2.17 AUXILIARY BUILDINGS

The auxiliary buildings will comprise of the following typical components:

- 33 kV switch room;
- Control building/ centre;
- Offices;
- Warehouses;
- Canteen & visitors centre;
- Staff lockers & ablution; and
- Gatehouse and security.

The total area occupied by auxiliary buildings is approximately 1 ha, excluding the HV substation.

2.18 BATTERY ENERGY STORAGE SYSTEM

The applicant is proposing the inclusion of a Battery Energy Storage System (BESS) as part of the 2Ha substation block within the Roan 2 PV Development. A Battery Energy Storge Technical document has been prepared by AMDA developments and is attached in Appendix E10. The following is summarised from this document.

2.18.1 Overview of the BESS

The BESS would be designed and used to store electricity generated by the Roan 2 PV project during high electricity generation periods. When there are constraints on electricity generation by the PV project, the stored electricity is used as security to provide energy on demand at a reliable capacity to the national grid. The BESS can also be used to supply electricity to the national grid when there is a greater demand for rapid electricity distribution. Load shedding in South Africa could eventually be something of the past with the BESS's. The BESS can supply the electricity required to power parts of South Africa. In using the BESS, people would not need to source other means of generating heat or light during load shedding. The use of diesel, gas, and / or coal etc. is commonly used during load shedding which causes harm to the environment.

The BESS is designed to be housed in containers on land previously assessed and is proposed to be built within the authorised substation area. As the BESS will be located within close proximity to the substation, lengthy transmission cables are not required. The length of the route of the proposed cable connecting the BESS to the PV on-site substation will be approximately 200 m. The BESS will be connected via underground cabling to the substation, if not technically feasible to only use underground cabling, overhead cabling will be used as an alternative.

2.18.2 Technical Details of the BESS

The specifications for the BESS are listed in the table below.

Table 3: Proposed Technical Details of the BESS

Type of Battery	BESS comprising Lithium-Ion Battery (with Redox Flow and Lead Acid listed as alternative battery technology[18])
Life span of BESS	Same duration as the Roan 2 PV facility ~ 20 years
Client	AMDA November (Pty) Ltd
Footprint	Approximately 1 hectare

[18] Redox Flow and Lead Acid Batteries have been excluded from further assessment as part of this environmental process.

Connection to Development	Underground cabling is the preferred alternative for connecting the on-site substation to the BESS. If not feasible to connect underground, overhead will be used as an alternative. The length of the route is proposed to be approximately 200 m.
Height of BESS	For the fence: 2.4 m For the containers: 2.9 m – 3.0 m
Other infrastructure	40' Tank Container (TC40) for O&M-control room and TC20 or TC40 for the delivery cabin to be connected to the Substation.

The figure below provides a visual representation of a typical set up of an on-site substation and BESS. The Roan 2 PV (if approved) will have similar project components with specifications as provided in this report.

Figure 13: SolarCity's Tesla Battery Storage Facility, Hawaii (AMDA Developments, 2022)

2.18.3 Benefits of the BESS for the Roan 2 PV

Unlike conventional energy storage facilities, such as pumped hydro, a BESS has the advantage of being flexible in terms of site location and sizing. As the BESS for the Roan 2 PV development is proposed to be built next to the authorised substation, it will avoid any visual effects. It offers a wide range of advantages to South Africa including renewable energy time shift, renewable capacity firming, electricity supply reliability and quality improvement, voltage regulation, electricity reserve capacity improvement, transmission congestion relief, load following and time of use. The BESS will have the ability to reduce the impact caused by the variability and limited predictability of wind generation and national grid instability. In essence, this technology allows renewable energy to enter the base load and peak power generation market and therefore can compete directly with fossil fuel sources of power generation and offer a truly sustainable electricity supply option.

Renewable energy stored by the development in the BESS will allow for an increased amount of energy to be supplied to the national grid. At times of shortage supplies from the PV Facility, rapid release of electricity can be supplied to the national grid without any emissions to the air, and may in future reduce the need for new distribution substations to be constructed.

2.18.4 BESS Components

All permanent elements of the BESS will be located within a secure perimeter fence with an area of 100 m by 100 m (1 ha) within the authorised substation area. The BESS will consist of a battery array which

will be housed in containers comprising of Lithium-ion. Compared to other battery options, Lithium-ion batteries are highly efficient, have a high energy density and are lightweight. As a result of declining costs, Lithium-ion technology now accounts for more than 90% of battery storage additions globally[19]. Redox Flow and Lead Acid are the proposed alternatives.

2.18.4.1 Layout and Positioning

The proposed BESS Will be positioned directly adjacent to the proposed substation as indicated in the image below.

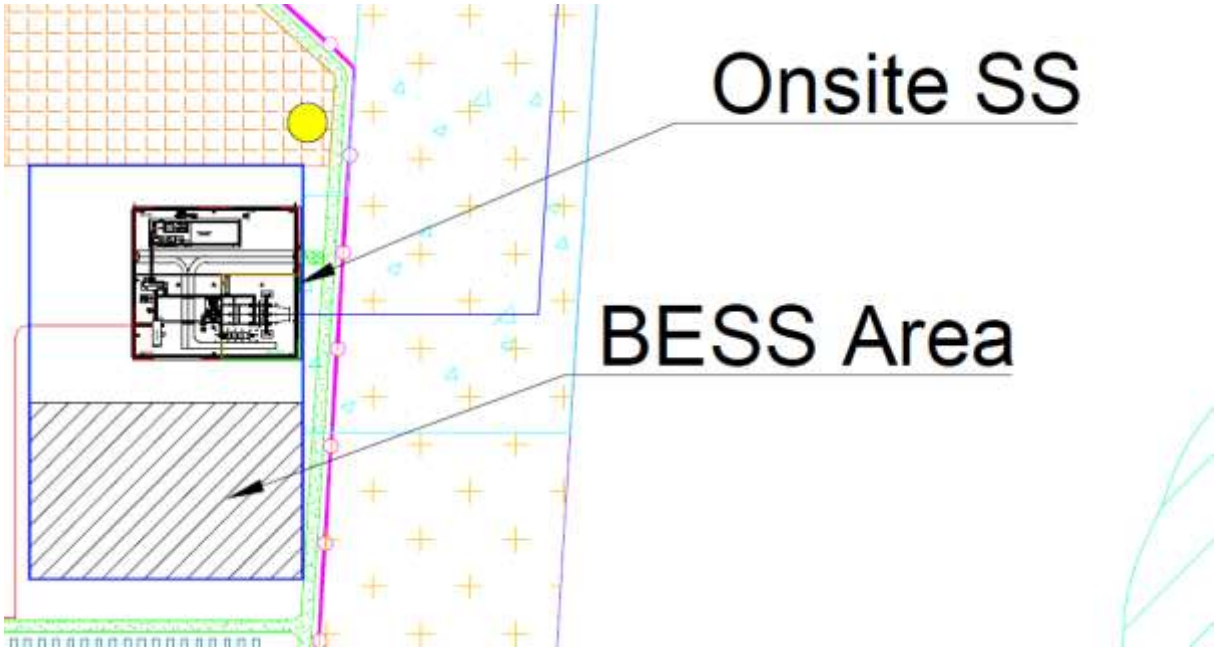

Figure 14: Proposed position of the BESS adjacent to the on-site substation.

2.18.5 BESS in South Africa

The BESS is relatively new and will become an integral support to the development of renewable energy technologies in South Africa. The development of a BESS associated with a PV system will promote added socio-economic benefits. The construction and installation of the BESS will create employment opportunities and it will be encouraged that the developer sources local manufacturers and employees, with the support of a skilled worker. For the operational phase of the BESS, software is expected to play an essential role as decentralised and digitised systems will be used.

As construction of a BESS being listed with a renewable energy development in South Africa is still not a common practice, the effect of this is that there is a major skills gap in our country regarding the BESS. It is important to ensure that the AMDA November (Pty) Ltd undertakes skills development to ensure that the processes, from installation, to use and disposal, will be effective and cause minimal environmental impact.

2.18.6 Risk Assessment of the BESS

The risks associated with the BESS are well researched and documented in other parts of the world. With the correct management plans and protocols in place, the BESS will not pose major risks to the environment in South Africa.

Construction Phase

[19] https://www.irena.org/publications/2019/Jul/Renewable-energy-statistics-2019

It is proposed that the BESS will be delivered to the development site in containers ready for connection to the WEFs electrical connection.

Operation Phase

There are two main concerns related to a BESS once operational, these are fire hazards and the potential for a condition known as '*thermal runaway*'[20].

Replacement / Decommissioning Phase

If batteries are replaced and / or once decommissioned, the disposal of the BESS may pose a risk to the environment.

The risk assessment mitigation will be be incorporated into a Battery Safety Management Plan that will form part of the final EMPr (Appendix H). The EMPr includes a high level risk assessment has been prepared to ensure that safety risks related to the BESS are understood, accounted for and mitigated as far as practicable.

The following international guidance has been considered during the preparation of this Risk Assessment:

- Allianz Risk Consulting (ARC), Tech Talk Volume 26 (2019). Battery Energy Storage Systems (BESS) using Li-ion batteries[21];
- National Fire Protection Association (NFPA) 855, Standard for the Installation of Stationary Energy Storage Systems, (2020 edition currently under development and not yet available)[22;]
- UL 9540, Standard for Energy Storage Systems and Equipment[23];
- Consolidated Edison and New York State Energy Research and Development Authority - Considerations for ESS Fire Safety (February 2017)[24.]
- The Energy Operators Forum "Good Practice Guide" (December 2014)[25];
- Institute of Engineering and Technology - Code of Practice for Electrical Energy Storage Systems (August 2017)[26]; and
- The Energy Institute: Battery Storage Guidance Note 1 - Battery Storage Planning (August 2019)[27].

The above standards and legislations are not specifically applicable to the proposed BESS for on this project, but notwithstanding, has provided valuable guidance for the preparation of this risk assessment.

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[20] Thermal runaway is a situation where the current flowing through the battery causes the temperature to rise, which increases the current with a further rise in temperature.

[21] https://www.agcs.allianz.com/news-and-insights/risk-advisory/tech-talk-volume-26-bess-english.html

[22] https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=855

[23] https://standardscatalog.ul.com/standards/en/standard_9540_1

[24] https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Energy-Storage/20170118-ConEd-NYSERDA-Battery-Testing-Report.pdf

[25] https://www.eatechnology.com/engineering-projects/electrical-energy-storage/

[26] https://shop.theiet.org/code-of-practice-for-electrical-energy-storage-systems

[27] https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fpublishing.energyinst.org%2Ftopics%2Fpower-generation%2Fbattery-storage%2Fbattery-storage-guidance-note-1-battery-storage-planning&data=01%7C01%7C%7Cfbce9f4783304951211308d72af01893%7C6b5953be6b1d4980b26b56ed8b0bf3dc%7C0&sdata=%2FgEjqDC2nzzxcKTWFaKkUEiiTiiOzTamrAsxsMz9Y4M%3D&reserved=0

The High-Level BESS Risk Assessment Matrix included in the EMPr assesses several potential situations which could result in a possible detrimental environmental hazard, which are:

- The actual **risks** associated with the delivery, connection, operation, maintenance, disconnection and disposal of the batteries.
- The **likelihood** of these actual risks occurring.
- The **significance** of the impacts should these risks take place.
- Appropriate and practical **mitigation** measures and/or management actions to reduce likelihood of the risk occurring and/or the impact.

2.19 ACCESS ROUTES AND INTERNAL ROADS.

The main access point will be obtained via the surfaced secondary road off the R503, as shown in blue in the figures below. An internal site road network will also be required to provide access to the solar field and associated infrastructure.

Figure 15: Proposed Main Access Road

Figure 16: Proposed Site Access Roads and Access Points

The proposed access points, as shown in the figure above, will need to be upgraded to cater for the construction and abnormal load vehicles. Generally, the road width at the access point needs to be a minimum of 8 m. The radius at the access point needs to be large enough to allow for all construction vehicles to turn safely. It is recommended that the access point be surfaced and the internal access roads on site remain gravel.

The type of access control will determine the required stacking distance. The stacking distance is measured between the access boom and the kerb/road edge of the external road. For example, for a boom-controlled access, this boom will need to be moved sufficiently into the site to allow for at least one abnormal vehicle to stack in front of the boom without impeding on external traffic. It is recommended that the site access be controlled via a boom and gatehouse. It is also recommended that security staff be stationed on site at the access booms during construction. A minimum stacking distance of 25 m should be provided between the road edge of the external road and the boom.

Any geometric design constraints should be taken into consideration by the geometric designer. The internal roads need to be designed with smooth, relatively flat gradients (recommended to be no more than 8%). It should be noted that turning radii of all roads must conform to the specifications needed for the abnormal load vehicles and haulage vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will hence need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed. The gravel roads will require grading with a grader to obtain camber of between 3% and 4% (to facilitate drainage) and regular maintenance blading will also be required. The geometric design of these gravel roads needs to be confirmed at detailed design stage.

The internal access roads will include a perimeter road of up to 3m wide and internal roads between the PV blocks of up to 7m wide. These are depicted by the green lines in the image below.

2.20 TRANSPORT OF COMPONENTS AND STAFF

A Traffic Impact and Transportation Study is attached in Appendix E11. This section focuses on the transportation requirements during the construction phase, as the operational transportation requirements are minimal with very little impact.

It is anticipated that the following vehicles will access the site during construction:

- Conventional trucks within the freight limitations to transport building material to the site;
- 40 ft container trucks transporting solar panels, frames and the inverter, which are within freight limitations;
- Flatbed trucks transporting the solar panels and frames, which are within the freight limitations;
- Light Differential Vehicle (LDV) type vehicles transporting workers from surrounding areas to site;
- Drilling machines and other required construction machinery being transported by conventional trucks or via self-drive to site; and
- The transformers will be transported as abnormal loads.

There are three viable options for the port of entry for imported components – the Port of Richards Bay in KwaZulu Natal (760 km from the site), the Port of Ngqura in the Eastern Cape (940 km from the site) and the Port of Saldanha in the Western Cape (1 310 km from the site).

The Port of Richards Bay is the preferred port of entry, however, the Port of Saldanha and the Port of Ngqura can be used as alternatives should the Port of Richards Bay not be available.

The preferred route from the Port of Richards Bay is shown in blue in the figure below. The route starts at the Port and primarily follows the R34 to Heilbron. Vehicles will head north-west on the R720 before turning west at Vredefort onto the R59. Vehicles will access the R76 at Viljoenskroon which leads to the R30 into Klerksdorp. Vehicles will head north-west on the R530 before turning off onto an unnumbered secondary surfaced road that accesses the proposed site.

The alternative route from the Port of Saldanha, shown in orange in the figure below, will follow the R45 east to Moorreesburg before taking the R46 east to Ceres. Vehicles will head east on the N1, passing Beaufort West before turning onto the N12 at Three Sisters. Vehicles will travel north-east, accessing an unnumbered secondary surfaced road leading to the proposed site.

The alternative route from the Port of Ngqura, shown in green in the figure below, will follow the N10 north to Cradock. Vehicles will follow the R390 and the R58 to the N1 at the Gariepdam. Vehicles will turn onto the R700 at Bloemfontein and will travel north-east, accessing the R719 at Buitfontein and the R30 near Bothaville before accessing the R503 at Klerksdorp that leads to the proposed site.

Figure 17: Preferred and Alternative Routes (JG Afrika, 2022)

It is critical to ensure that the abnormal load vehicle will be able to move safely and without obstruction along the preferred route. The preferred route should be surveyed prior to construction to identify any problem areas, e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a “dry-run” with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that the delivery will occur without disruptions.

It needs to be ensured that any gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.

2.20.1 Route for Components manufactured locally

As mentioned in the traffic assessment, it is anticipated that elements manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg and Pinetown/Durban areas. It is also assumed that the transformer, which will be transported with an abnormal load vehicle, will be transported from the Johannesburg area and therefore it needs to be verified that the route from the manufacturer to the site does not have any load limitations for abnormal vehicles. At this stage, only a high-level assessment can be undertaken as no information of the exact location of the manufacturer is known and all road structures (such as bridges and culverts) need to be confirmed for their load bearing by the South African National Roads Agency (SANRAL) or the respective Roads Authority.

2.20.2 Route from Cape Town to Proposed Site

Components, such as PV modules, manufactured in Cape Town will be transported to site via road as shown in the figure below. Haulage vehicles will travel from Cape Town on the N1 and the N12, passing Laingsburg, Beaufort West, Three Sisters, Kimberley, and Bloemhof.

Haulage vehicles will mainly travel on national highways and the total distance to the proposed site is approximately 1 260 km.

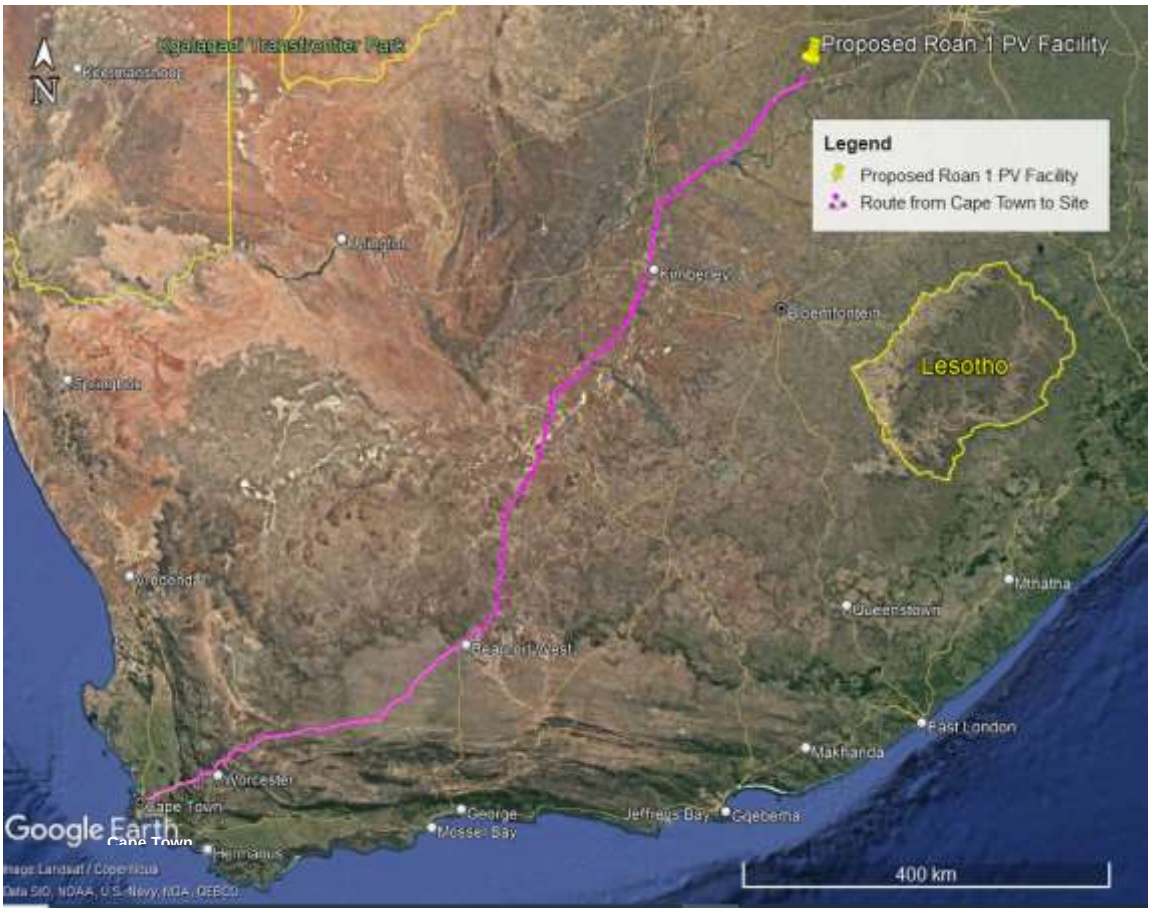

Figure 18: Route from Cape Town to Proposed Site (JG Afrika, 2022)

2.20.3 Route from Johannesburg to Proposed Site

It is assumed that the inverter and support structure will be manufactured in the Johannesburg area and transported to site via the N12 and the R503. The travel distance is around 195 km and no road limitations are expected on this route for normal loads vehicles as it will mainly follow national and provincial roads. The route is shown in the figure below.

Figure 19: Route from Johannesburg to Proposed Site (JG Afrika, 2022)

2.20.4 Route from Pinetown / Durban to Proposed Site

If the PV modules are manufactured in South Africa, they could possibly be manufactured in the Pinetown area, close to Durban and transported to site via road. These elements are normal loads, and no road limitations are expected along the routes, which is shown in the figure below. Haulage vehicles will mainly travel on national and provincial roads and the total distance to the proposed site is approximately 650 km.

Figure 20: Route from Pinetown / Durban to Proposed Site (JG Afrika, 2022)

2.20.5 Route from Johannesburg Area to Site – Abnormal Load

It is assumed that the transformer will be manufactured locally in South Africa and be transported from the Johannesburg area to site. As the transformer will be transported with an abnormal load vehicle, the route planning needs a more detailed investigation of the feasible routes considering any limitations due to existing road features. Furthermore, a load of abnormal dimensions may cause an obstruction and danger to other traffic and therefore the transformer needs to be transported as far as possible on roads that are wide enough for general traffic to pass. It is expected that the transformer can be transported to site via the same route used for normal loads.

There are several bridges and culverts along this route, which need to be confirmed for load bearing and height clearances. There are several turns along the way and small towns to pass through. According to the desktop study, all turning movements along the route are manageable for the abnormal vehicle.

However, there are many alternative routes which can be investigated if the above route or sections of the route should not be feasible.

2.21 SERVICES REQUIRED

The services required for the construction and operation of the proposed Roan 2 PV are outlined in Appendix E10 and summarised below. As part of this basic assessment process, the City of Matlosana Local municipality will be provided with an opportunity to comment on the availability of services needed for the development of Roan 2 PV.

2.21.1 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 generated during construction will be separated into recyclable components and removed from site by a licenced recycling service provider. All non-recyclable waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by the contractor. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility. The applicant has submitted a letter of request to the technical services department within the City of Matlosana Local Municipality requesting consent to make use of the local solid waste landfill site. Excess excavation material will either be spoiled offsite at a registered facility or used for landscaping berms[28] within the overall PV footprint.

2.21.2 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. The applicant has submitted a letter of request to the technical services department within the City of Matlosana Local Municipality requesting consent to make use of the local waste water treatment plant.

Once construction is complete, the chemical ablution facilities will be removed from the site. A conservancy tank which will be regularly emptied by a registered service provider will be installed at the Operations & Maintenance building and on-site/ facility substation and the BESS control room.

2.21.3 Hazardous substances

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

- Cement associated with piling activities and construction of buildings and inverter station plinths;
- Petrol/ diesel for construction plant; and
- Limited amounts of lubricants and transformer oils.

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.

[28] If any landscaped berms are constructed around infrastructure, these must be done in such a way as to comply with the overall Stormwater design philosophy of maintaining sheet flow.

Figure 21: Hydrocarbon Spill Kits must be in place within the site camp and in the field within 500 m of any drilling or ramming activity.

2.21.4 Water Supply

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

1. The Local Municipality (LM) - The applicant has submitted a letter of request to the technical services department within the City of Matlosana Local Municipality requesting confirmation of water availability to supply the construction and operational phase of the Roan 2 PV. Should the City of Matlosana Local Municipality have sufficient volumes/ the water will most likely be trucked in, or otherwise made available for collection at their Water Treatment Plant via a metered standpipe. Specific arrangements will be agreed upon with the City of Matlosana Local Municipality (should they have sufficient capacity for tor the project) in a Service Level Agreement, which will only be concluded if the project receives preferred bidder status in terms of the REIPPPP.
2. Investigation into a third-party water supplier which may include a private services company.
3. 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.

2.22 PROJECT NEED AND DESIRABILITY

In keeping with the requirements of an integrated Environmental Impact process, the DEA&DP *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 (overview to alternative energy in South Africa and the North West Province) 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 however considers the need and desirability of this specific project at this point in time.

2.22.1 Feasibility consideration

The commercial feasibility for the proposed 120 MW_{AC} Roan 2 PV to be built on private land near Hartbeesfontein, has been informed by its contextual location, and economic, social and environmental impacts and influence (with due consideration to the project falling within a REDZ). The project has gathered sufficient information and conducted studies of the site and the region to make qualified and reliable assumptions on the project's various impacts.

2.22.2 Solar Resource & Energy Production

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. The proposed site receives some of the highest Global Horizontal Irradiation (GHI) outside of the Northern Cape, South Africa.

2.22.3 Access to Grid

The Eskom Roan Substation is located approximately 4.5km east of the Roan 2 PV substation position and as such, the proposed project can connect to the grid via a very short powerline that is not likely to have any major environmental impacts.

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

In addition, Eskom's '2040 Transmission Network Study' has drawn on various scenarios to determine the grid's development requirements, as well as to identify critical power corridors for future strategic development, of which the Central corridor[29] is one of these.

[29] Roan 2 PV and the associated grid connection falls within this corridor as well as in the Klerksdorp REDZ.

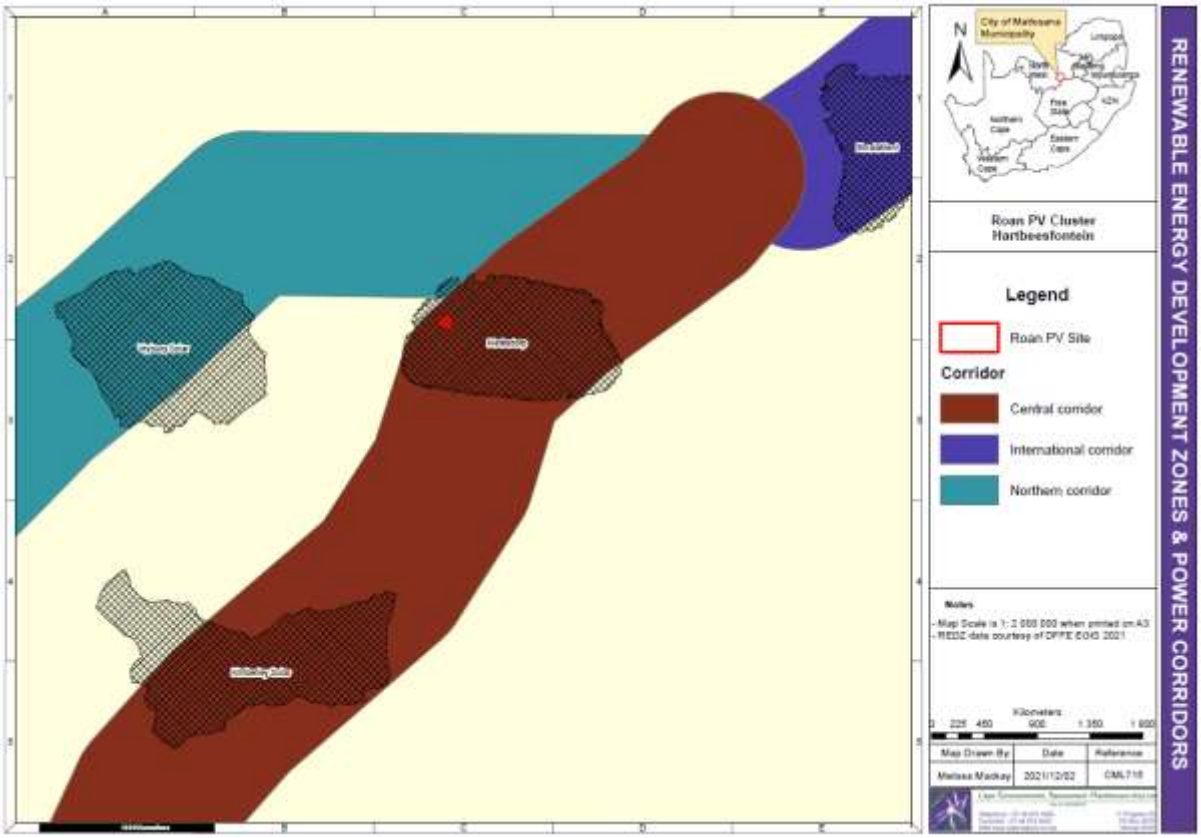

Figure 22: Plan showing the study site within the REDZ and Strategic Electrical Grid Corridor.

2.22.4 Site Suitability

Among the outstanding characteristics of the Roan 2 PV site is it is relatively flat, sufficient medium sensitivity environments (the proposed layout plan was able to avoid all areas with a high sensitivity and very high sensitivity) and accessible location, facilitating the delivery of bulky PV panel infrastructure, and the construction and assembly process. The proximity of the site to the main road decreases the impact on secondary roads from the traffic going to and from Roan 2 PV during construction and operations.

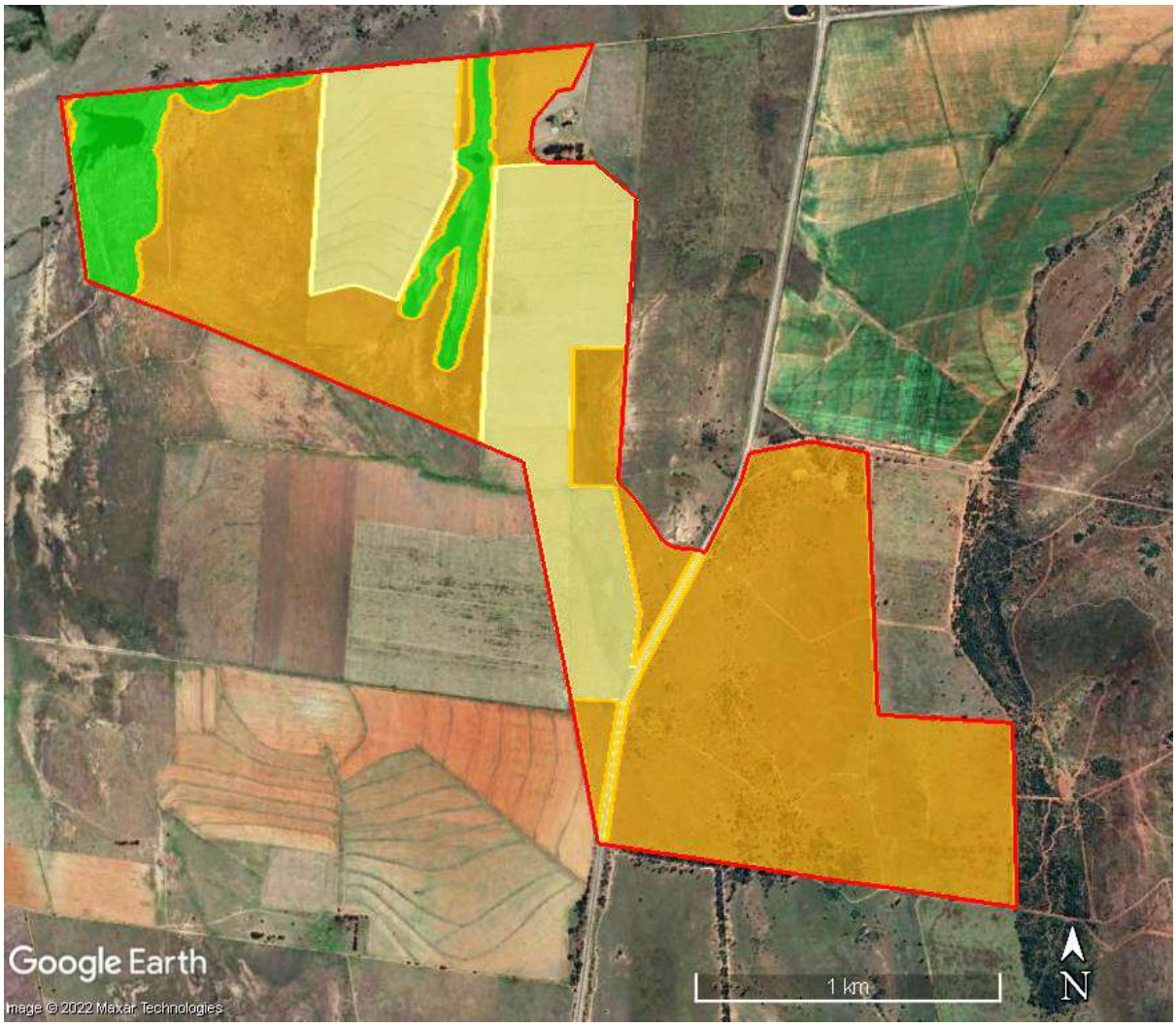

Figure 23: Showing the sensitivity of the Roan 2 Study Area (High sensitivity in green, Medium Sensitivity in orange and low sensitivity in yellow).

The preferred alternative has been developed in such a way at to completely avoid all high sensitivity areas (The footprint is contained entirely within medium and low sensitivity areas).

The close proximity of the existing Eskom Roan Substation also allows for connection via a short distribution line. As the site is not used for intensive agricultural purposes, Roan 2 PV will therefore not significantly interfere with the agricultural productivity of the area.

2.22.5 Social and Economic impact

Please refer to the Social Impact Assessment Report in Annexure E8 for a detailed description of the social environment. The social impact assessment concluded that the potential social impacts associated with the proposed Roan 2 PV range from high positive, to low negative.

The findings of the Social Impact also indicate that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives.

2.22.6 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.

Roan 2 PV will have a positive impact on local employment. During the estimated 18-month construction phase, the project will employ approximately 350 individuals of various qualifications. The majority will be provided by the local labour market.

During operations, Roan 2 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, Roan 2 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.

2.22.7 Need (time)

In accordance with the guidelines on need and desirability, a project should be able to answer a series of questions to demonstrate need. These are highlighted in the table below:

Table 4: Project Need Analysis

Need	Discussion	
Is the land use considered within the timeframe intended by the existing approved Spatial Development Framework (SDF)? (I.e., is the proposed development in line with the projects and programmes identified as priorities within the credible IDP?	Yes	As per the North West Provincial Spatial Development Framework (PSDF) (2017) electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%). Electricity for supply to the North West Province is mostly generated by Eskom's Matimba coal-fired Power Station in Limpopo which will in future be augmented by Eskom's Medupi coal-fired Power Station. According to the North West PSDF the proposed project site is located within the Mahikeng Distribution Area, which is characterised by minor developments, including Commercial, Industrial, and Major Electrification; and has a projected growth of 125MW (Eskom, 2015). Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10 year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400kV power lines and transformation to support or relieve the existing networks. Five transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements Section 5.2.1 of the SDF, Natural Systems Synthesis, notes that the Annual Horizontal Solar Radiation is fairly high – 2000 – 2100 KWh/m2, increasing towards the north. Similarly, wind speeds of 6 – 8m/s are also fairly high. The section notes that both these sources could be potential energy generators. Considering the above, it can be concluded that the area is suitable for PV development in terms of the SDF.
Should the development occur here at this point in time?	Yes	The proposed Roan 2 PV energy facility is to be located outside the Hartbeesfontein urban edge, but within a legislated REDZ, and would promote diversification to the local economy as well as serve as a catalyst for further expansion in the stream of sustainable renewable energy development within this REDZ. As outlined in the section above, the Eskom Roan substation has

Need	Discussion	
		existing excess capacity in order to accommodate the development right away (thus reducing the opportunity costs).
Does the community / area need the activity and the associated land use concerned?	Yes	The City of Matlosana Local Municipality identified the opportunity for a renewable energy project through their SDF and IDP processes, which include public participation. The proposed Roan 2 PV development will allow for a diversification of employment, skills and contribute to the potential development of small business associated with its construction, operation and maintenance activities. The proposed Roan 2 PV development will contribute electricity to the constrained North West and National electrical network, contributing to a provincial and national need. Roan 2 PV has been designed in such a way so as to avoid or minimise potential negative impacts of the local environment while enhancing potential positive impacts, locally and regionally.
Are the necessary services with adequate capacity currently available?	partially	Roan 2 PV requires the installation of an overhead power line to connect to the existing Eskom Roan Substation (feed into the national grid system), as well as a very short access road from the existing main road. The cost of supplying the new infrastructure will be covered by the Applicant, and the impacts thereof have been assessed in this environmental process. The water required for the construction and operation of Roan 2 PV will be sourced from the City of Matlosana Locan Municipality (preferred option) and will be supplemented by stored rainwater. The applicant may at a later stage consider the utilisation of groundwater to supplement this supply, this will however be subject to approval in terms of the National Water Act. Construction waste (general waste) will be disposed of at the existing landfill sites. Defunct and damaged modules identified during construction will be returned to the supplier for recycling and/or disposal.
Is this development provided for in the infrastructure planning of the municipality?	Yes	Yes. Attracting private investment and the employment opportunities associated with renewable energy development are identified as priority strategies to create sustainable urban and rural settlements.
Is this project part of a national programme to address an issue of national concern or importance?	Yes	In order to meet the increasing power demand within South Africa, Eskom has set a target of 30% of all new power generation to be derived from independent power producers (IPPs). The Applicant is one such IPP which intends to generate up to 120MW of electricity from the proposed Roan 2 PV, for input into the national grid (via the existing Eskom Roan Substation. The proposed Roan 2 PV is also situated within a legislated REDZ.

2.22.8 Desirability (place)

In accordance with the guidelines on need and desirability, a project should be able to answer a series of questions to demonstrate desirability. These are highlighted in the table below:

Table 5: Project Desirability Analysis

Desirability	Discussion	
Is the development the best practicable environmental option for this land / site?	Yes	The target property is outside the Hartbeefontein Urban Edge, within a legislated REDZ. The property has a relatively poor agricultural potential due to various limiting factors. These factors have rendered the property vacant with minimal extensive agiculture limited land use option alternatives. Considering these factors, it is very unlikely to be considered for an alternative land use such as urban development. The property is furthermore not within an area earmarked for the expansion of protected areas, nor does it contain any unique biodiversity features. The area is thus unlikely to be considered for conservation use.
Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?	No	The City of Matlosana Integrated Development Strategy focuses on the following issues: • The regeneration of the manufacturing sector • The growth of tourism and the linkages to the sector • The growth of agriculture • The development and growth of the information technology sector • The re-skilling of the labour force • The regeneration of industrial areas and CBD's and upgrade of residential areas • Facilitate the utilization of co-operatives in the municipality's procurement system • Facilitate the growth and contribution of SMME's. The City of Motlosana's IDP has moved from forming to storming then to. The proposed solar energy facility will contribute to job creation, economic growth and development in the region, which will be KPA 2 of the City of Matlosana IDP.
Would the approval of this application compromise the integrity of the existing approved environmental management priorities for the area?	unlikely	According to the national vegetation map (Mucina & Rutherford 2018, the solar development site lies entirely within two vegetation types that is classified as Least Threatened and Endangered. Portions of the site are situated in a CBA 1. The ecology specialist confirmed that Vaal-Vet Sandy Grassland vegetation type (an endangered vegetation type), is mapped for parts of the site. During surveys at the site, it was found that the original vegetation type is modified at large parts of the site and that the scope to conserve the small more natural remaining grassland at the site as a conservation area for the vegetation type, is small. The Terrestrial biodiversity specialist furthermore confirmed that there is little scope for most of the site to be part of a corridor of particular conservation importance. The non perennial streambeds, in-channel dams, riparian zones and buffer zones, as well as the rocky ridge are corridors of particular conservation concern and have been excluded from the development footprint.
Do location factors favour this land use at this place?	Yes	The region has been identified as being one of the most viable areas for solar energy generation outside of the Northern Cape due to the following factors: • Excellent solar radiation (compared to other regions); • Close to existing main transport routes and access points; • Close to connection points to the local and national electrical grid; and

Desirability	Discussion	
		• Outside of very high and high sensitivity areas. The proposed site is furthermore situated within a legislated REDZ and as such has been subjected to a detailed Strategic Environmental Assessment in which highly sensitive landscapes were already excluded from these areas. The ecological sensitive areas on and surrounding the solar site have informed the optimal location and layout for the proposed solar project, with minimal impact to the receiving environment, subject to implementation of mitigation measures.
How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas?	Yes	The alternatives considered for the solar development have been iteratively designed and informed by various investigations and assessments that considered both the natural and cultural landscapes. The natural and culturally sensitive areas have been identified and where possible, avoided to prevent negative impacts on such areas.
How will the development impact on people's health and wellbeing?	Yes	The site is located outside of the Hartbeesfonteil Urban Edge and as a result is unlikely to impact negatively on the community's health and wellbeing.
Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	Unlikely	The next best land use alternative to the solar facility is limited agriculture (the status-quo). However, the proposed development site does not have any significant agricultural value and has not been utilised for any intensive agricultural purposes. The carrying capacity of the site is too low to generate noteworthy financial benefit from agricultural activities. The development of the proposed solar facility would constitute the loss of approximately 193ha of the overall property. The economic benefits and opportunities that the proposed solar development holds for the landowner and the local economy of the municipal area cannot be recovered from the current or potential agricultural activities. The opportunity costs in terms of the water-use requirements of Roan 2 PV are within acceptable bounds if one considers the minimal demand on the resources.
Will the proposed land use result in unacceptable cumulative impacts?	Unlikely.	The sites are within the legislated REDZ have been identified as an area with high potential for renewable energy generation: The potential for further, future solar developments in the area cannot be discounted (as many have already been approved or are in progress). However, these will have synergistic benefits for the economy and growth of the area, while the contribution to cumulative habitat loss in the area associated with this and potential future solar development would be relatively small in relation to the land resources available, with low impacts restricted to the local area.

2.23 SITE SELECTION PROCESS

The site selection process followed a two-stage approach; firstly, to select the properties for the proposed development (In the case of Roan 2, this was Portions 4,5,9 and 16 of the farm 299.) and secondly, to select the footprint of the proposed development within the farm portion.

2.23.1 Property Selection[30]

In choosing a site for the development of a solar PV project , the developer goes through a process of evaluating a number of possible alternative sites in terms of the criteria that would make a viable site worth bidding in the REIPPPP.

The REIPPPP is a very competitive program and a site that is marginally less suitable from a solar resource or development cost perspective has less chance of securing a successful bid. Much effort is placed into evaluating and selecting the best available sites.

The main criteria used in the evaluation of the alternative development sites are:

- a good solar resource,
- proximity to the Eskom grid,
- availability of Eskom grid capacity,
- a flat open site,
- sufficient development space,
- no mountains nearby,
- low value land,
- low agricultural potential,
- low environmental sensitivity, and
- availability of water.

These are discussed separately below.

2.23.1.1 a good solar resource,

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. This area of the North West Province receives some of the highest Global Horizontal Irradiation (GHI) outside of the Northern Cape, South Africa.

The GHI for the Klerksdorp region varies between 2,000 and 2,050 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.

2.23.1.2 proximity to the Eskom grid,

The Eskom Roan Substation is located approximately 1.2km east of the proposed pv substation position as illustrated in the topographical plan below.

[30] This section is summarised from The technical design report in annexure E9.

Figure 24: Proximity of Roan 2 PV to the existing Eskom Roan Substation.

One of the exceptional characteristics of Roan 2 PV is that it can connect to the national grid via a relatively short powerline.

Figure 25: Eskom Roan Substation in very close proximity to the proposed project.

2.23.1.3 availability of Eskom grid capacity,

The applicant has undertaken a grid feasibility study, which has indicated that the grid would have sufficient capacity to evacuate the power from the facility. It must be noted that this assessment includes the provision of an additional feeder Bay at the Eskom Roan Substation.

The national power corridors consisting of five transmission power corridors of 100 km in width have been gazetted by the Department of Environmental Affairs (DEA) following the outcome of the strategic environmental assessment (SEA) which aimed to identify environmentally acceptable routes where strategic grid strengthening activities are likely to take place. Roan 2 PV falls into the Central corridor.

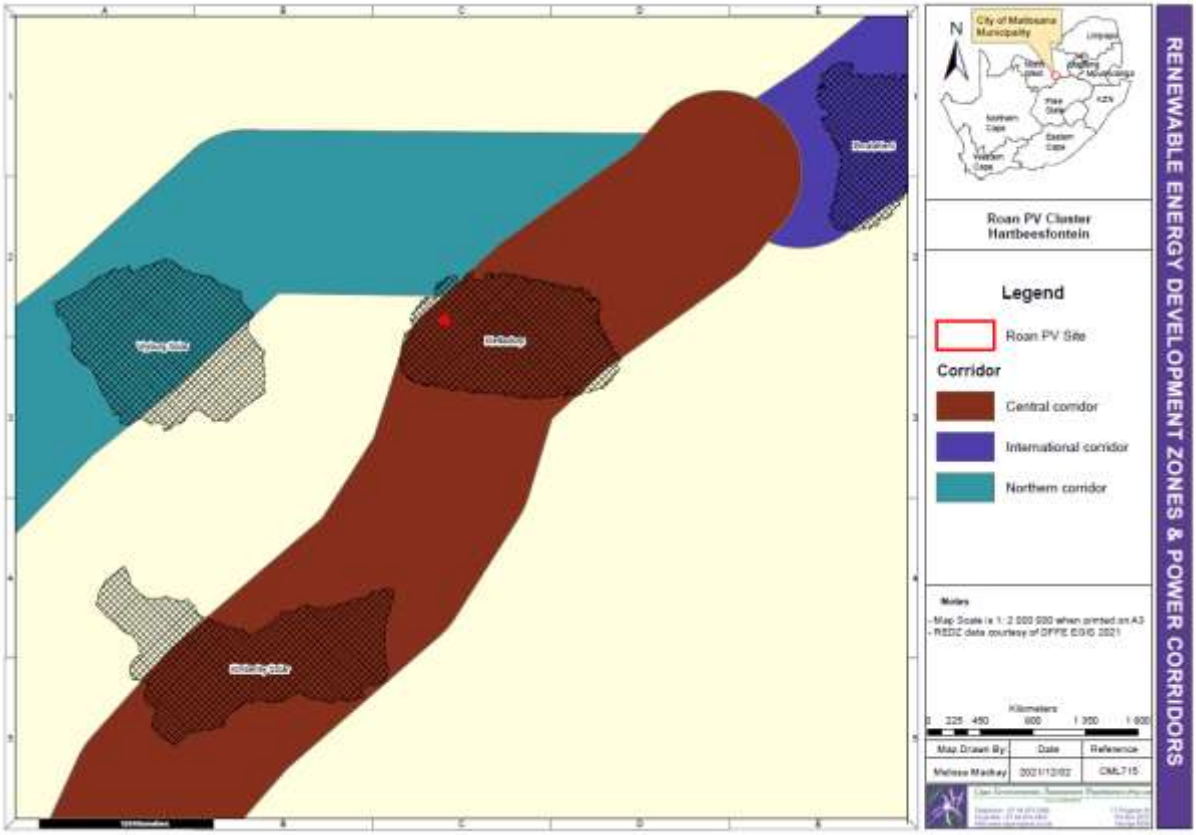

Figure 26: Eskom "Critical Power" Corridors. The Roan 2 PV Cluster is located within the Central corridor.

2.23.1.4 a flat open site,

Portions of the site do contain woody vegetation, while other areas are relatively open. The majority of the study site is relatively flat, with steeper areas to the South and west of the Roan 2 PV East portion of the site. These steeper areas to the west and south have been excluded from the proposed development footprint.

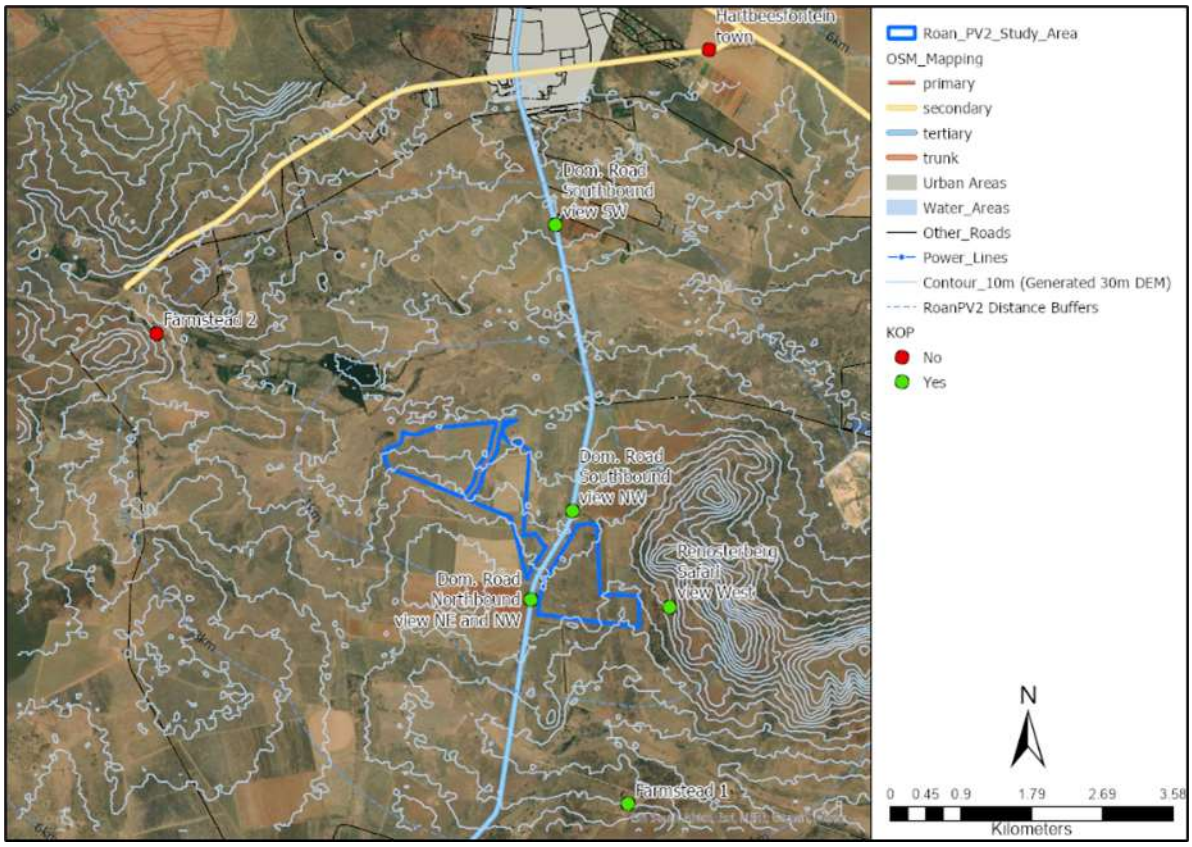

Figure 27: Contour Plan of Roan 2 PV (Stead, 2022).

2.23.1.5 sufficient development space,

The total property size is approximately 565 ha, meaning there is sufficient space to accommodate a 120MW PV development as well as the sensitivities identified by the specialists.

2.23.1.6 no mountains nearby,

There is higher lying ground to the west, known as Renosterberg. This is however deemed to be far enough away from the proposed facility in order to not pose an issue.

2.23.1.7 low agricultural potential,

The agricultural specialist confirmed that the entire site as medium sensitivity for impacts on agricultural resources with a maximum land capability value of 7. The cropping potential of the site is limited by the combination of a marginal climate and sandy soils with limited, water holding capacity due to depth limitations.

2.23.1.8 low environmental sensitivity, and

As discussed in more detail further down in this report. The preferred development footprint was positioned in such a way as to avoid all High and Very High Sensitivity areas.

2.23.2 Footprint selection

The selection of the proposed footprint followed a risk adverse, bottom-up approach in order to ensure that the impacts of the proposed developments can be avoided as far as possible. This avoidance approach reduces the degree of mitigation required in order ensure that potential environmental impacts are within acceptable levels.

An initial study area was identified based on the criteria outlined in the section above.

Figure 28: Initial Study Area.

The initial study area did not consider any environmental sensitive areas was driven primarily by the factors detailed in the previous section.

The applicant then began to apply desktop selection criteria the initial study site and also commenced with discussions with affected landowners. Based on the outcome of the desktop assessment and landowner discussions, the preliminary development areas were determined.

Figure 29: Preliminary development areas within the initial study site.

Following the identification of the preliminary area, various specialists (ecology, heritage (inclusive of archaeology), palaeontology, aquatic/ freshwater and avifauna) were appointed to assist in the footprint selection process by means of undertaking an environmental sensitivity analysis of the site and surround. Each of the specialists mapped the sensitive areas after the completion of their respective site inspections.

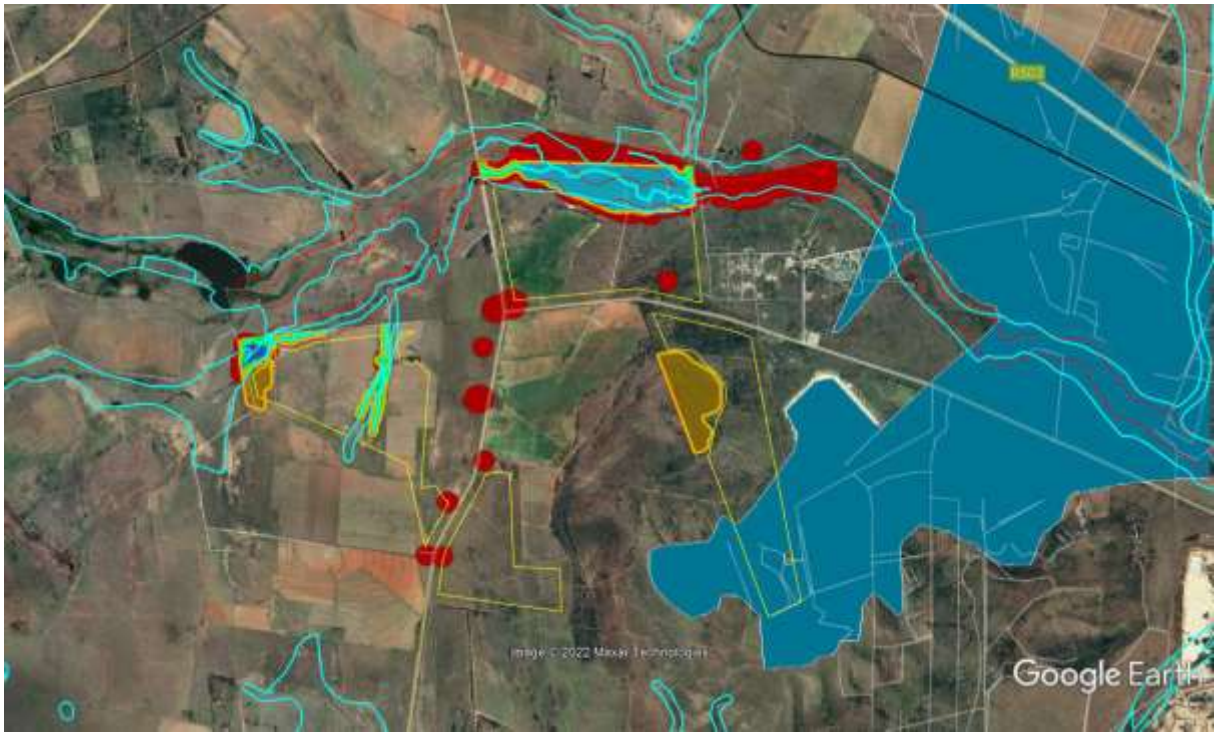

Figure 30: Sensitive Features (Terrestrial Biodiversity, Aquatic Biodiversity, Stormwater, Avifaunal and Visual) in relation to the preliminary development areas.

After completion of this environmental sensitivity analysis, the engineering team produced a preferred / mitigated layout that avoided all the high and very high sensitivity features as well as the buffer areas recommended by the participating specialists.

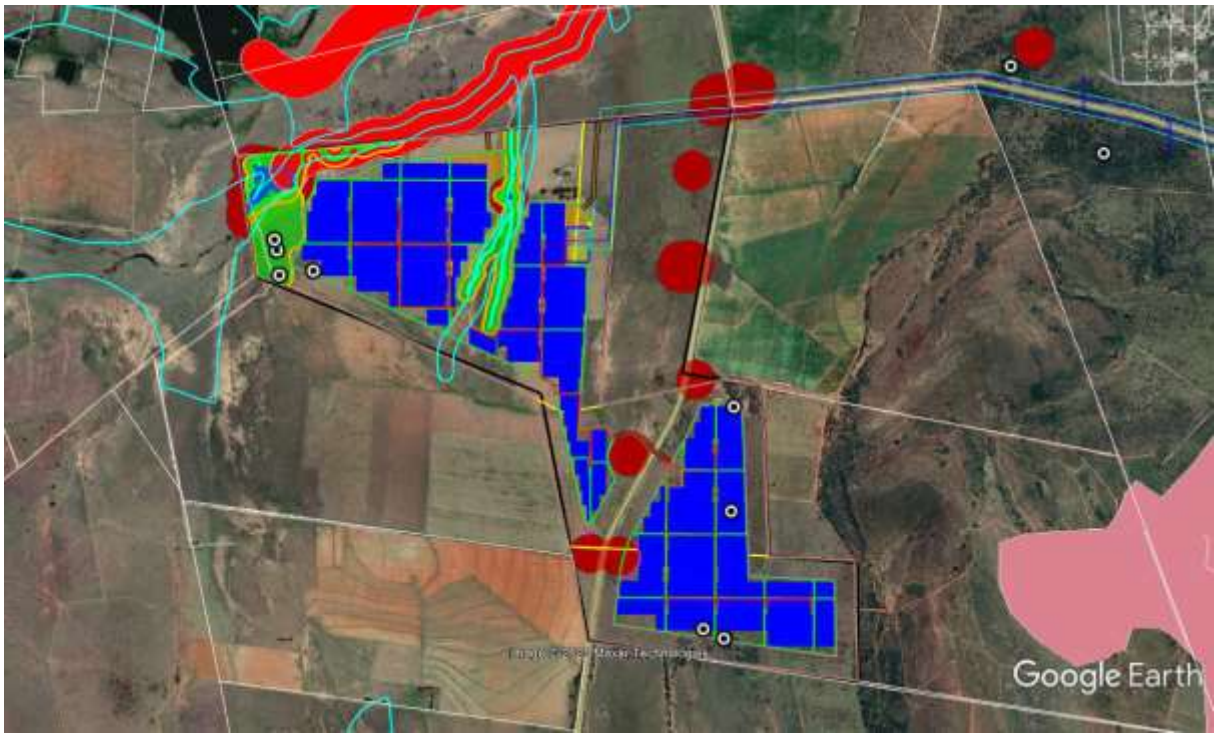

Figure 31: Preferred / Mitigated footprint of Roan 2 PV within the preliminary development area, and avoiding all high and very high sensitivity features.

This extensive upfront consultation with the various specialists mitigated many of the impacts associated with the planning and design phase.

2.24 CONSIDERATION OF ALTERNATIVES

Roan 2 PV will consist of solar PV technology with fixed, single or double axis tracking mounting structures, with a net generation (contracted) capacity of 120 MW_{AC} as well as associated infrastructure.

In terms of the of the guidelines on consideration of alternatives, alternatives can include:

- Site Alternatives (please refer to the site selection process detailed in section 2.10).
- Technology Alternatives (please refer to section 2 where technology alternatives are discussed in further detail).
- Layout Alternatives (discussed below).

In compliance with the regulations, as a minimum, the No-Go Alternative must be considered and assessed.

2.24.1 Layout Alternatives

As mentioned earlier in this report (when describing the footprint selection process), a much larger preliminary study area was analysed by relevant specialists to determine the sensitivity. The preferred layout was then developed taking into account the sensitivities identified by the participating specialists.

Therefore, the preferred layout alternative (Layout Alternative 1) within the initial study site and preliminary development area was the only layout alternative assessed for Roan 2 PV. Layout Alternative 1 avoids all high and very high sensitivity features as well as the buffers identified by the participating specialists.

Figure 32: Preferred layout (Layout Alternative 1) for Roan 2 PV.

This preferred layout proposed in this report (Layout Alternative 1) has thus gone through multiple stages of refinement until its current stage and is considered to be the best practicable environmental option.

2.24.2 Grid Connection Alternatives

Roan 2 PV will connect directly to the Roan Eskom substation. This will be a short powerline and as such no alignment alternatives can be considered.

2.24.3 Access Road Alternatives

As detailed in section 2 of this report, a number of access road alternatives were initially considered for the proposed development. The position of the proposed access roads to the preferred alternative (Layout Alternative 1) has been determined with input from a Traffic specialist.

2.24.4 The no-go alternative

The no-go Alternative (or status quo) proposes that Roan 2 PV does not go ahead and that the area in proximity to the Eskom Roan Substation and within a Renewable Energy Development Zone remain undeveloped as it is currently.

The land on which the Roan 2 PV is proposed is currently vacant. It is currently used for limited game and livestock grazing activities, however due to a combination of factors, it has no potential for irrigated crop cultivation (this has been confirmed by the Agricultural Specialist.

The solar-power generation potential of the area, particularly in proximity to the existing substation and within the REDZ is significant and will persist should the no-go alternative occur.

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 Roan 2 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 Roan 2 PV; however, it will be used as a baseline from which to determine the level and significance of potential impacts associated with the proposed Roan 2 PV.

2.24.5 Comparison of alternatives

The table below reflects the key environmental advantages and disadvantages of the two layouts (i.e., the preferred layout (Layout Alternative 1) and the preliminary development areas.

Table 6: Comparison of Advantages and Disadvantages of Layout Alternatives described above.

Alternative	Preference	Reasons (incl. potential issues)
PV Layout Alternatives		
Layout Alternative 1	Preferred	- Limited to habitat of Medium Sensitivity. - Topographically suitable. - Avoids all high and very high ecologically sensitive areas. - Avoids all high and very high hydrologically sensitive areas. - Avoids all very high avifaunal sensitive areas (namely the watercourses and their associated buffers).
Preliminary Development Area	Portions Less Preferred, eliminated from further assessment	- Portions of the initial assessment area are topographically unsuitable for the development of PV. - Portions of the initial assessment area consist of high and very high ecologically sensitive areas. - Portions of the initial assessment area high and very high hydrologically sensitive areas. - Portions of the initial assessment area are within areas with a very high avifaunal sensitivity and their buffers.

Layout alternative 1 will be assessed against the no go alternative for the purposes of this Basic Assessment.

2.25 PROJECT PROGRAMME AND TIMELINES

As mentioned previously Roan 2 PV is intended to be bid into the REIPPPP. The programme has definite and stringent timelines that the project needs to meet. The implementation schedule below is based on the best available information we have at this time and is subject to change.

Table 7: Preliminary implementation schedule.

	Description	Timeline
1	Expected REIPPPP submission date (6th round)	Third Quarter of 2022
2	Preferred bidders selected	First Quarter 2023
3	Finalisation of agreements	Second Quarter 2023
4	Procurement of infrastructure	First Quarter 2024

5	Construction	2024
6	Commissioning	2024

The table above clearly depicts the dependence of the project on the REIPPPP's timelines. Any delay or acceleration within the REIPPPP will have a corresponding effect on the timelines of the projects. Also, as mentioned, no official public submission date for Round 6 has been communicated by the DoE.

NOTE: Roan 2 PV intends submitting their bid during the 6th bidding window or thereafter if unsuccessful in immediate bidding rounds. Due to the uncertainty regarding the timing of these bidding windows, the Department is herewith requested that the validity period of the environmental authorisation (if authorised) be for the full 10 year allowable in terms of the regulations.

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 Roan 2 PV [31].

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
    - 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)[32]. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the

[31] This section has been prepared with input from the Social Specialist (see Annexure E9)

[32] 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.

competent authority (in this case, the national Department of Environmental Affairs, DEA) based on the findings of an Environmental Assessment.

The proposed development entails a number of listed activities, which would normally require a Scoping & Environmental Impact Reporting process, but due to the project falling within a legislated REDZ, only requires a Basic Assessment Process. Such a process must be conducted by an independent EAP. Cape EAPrac has been appointed to undertake this process. The figure below depicts a summary of the Basic Assessment process.

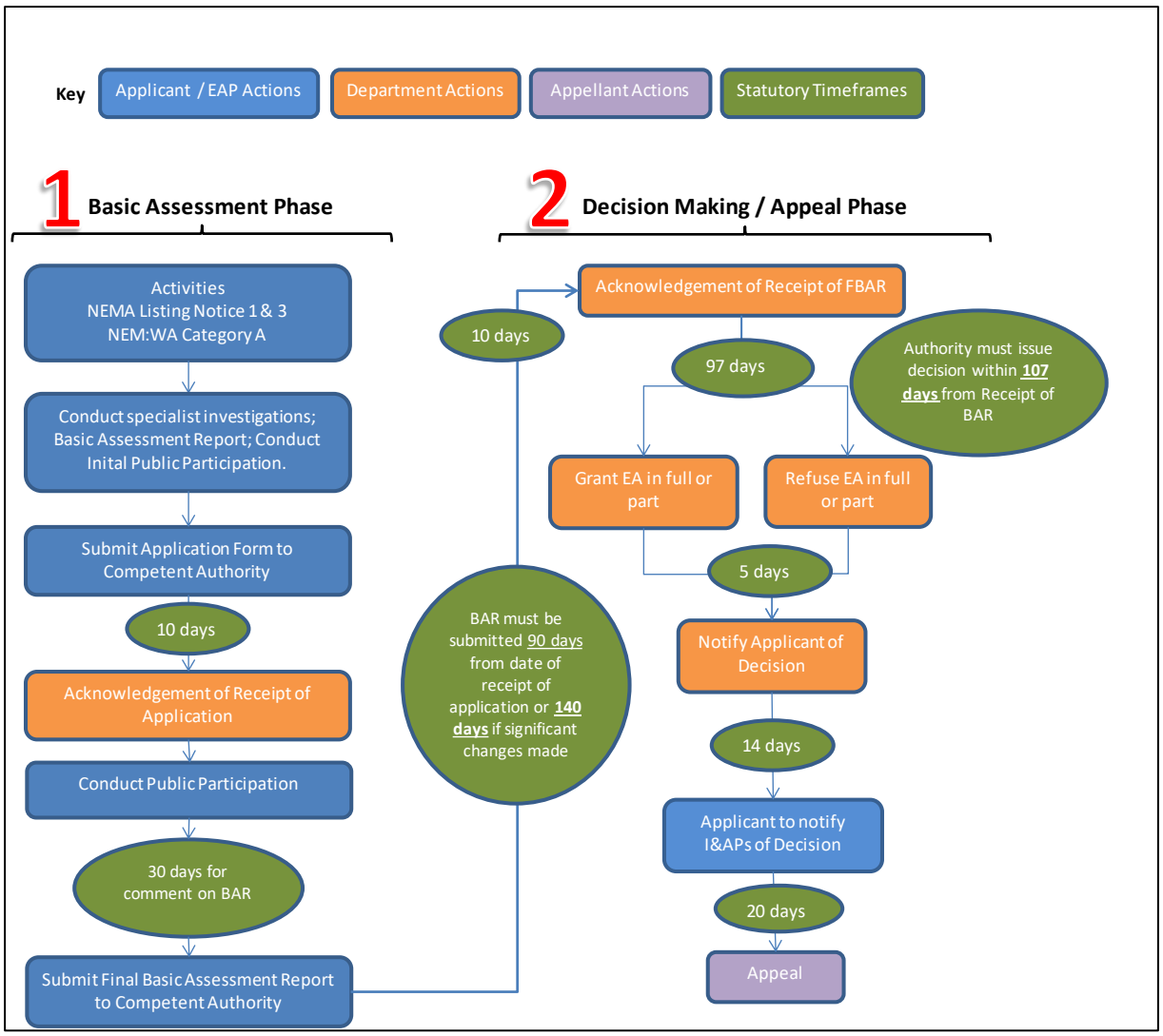

Figure 33: Summary of Basic Assessment Process in terms of the 2014 Regulations (as amended).

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

Table 8: NEMA 2014 (As amended in April 2017) listed activities applicable to Roan 2 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 as well on site substations and an overhead powerline with a capacity of up to 132 kilovolts.

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 roads to Roan 2 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 Roan 2 PV development is considered to be commercial use and the total footprint size will exceed 1 hectare.
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 main road will be widened by more than 6m in some places.
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 Roan 2 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 Roan 2 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;	Portions of Roan 2 PV fall within a CBA identified in the North West Province Biodiversity Sector Plan. The internal roads of Roan 2 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 Roan 2 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 v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	A portion of Roan 2 PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Roan 2 PV occur within this CBA.

NOTE: Basic Assessment as well as S&EIR Activities are being triggered by the proposed development, but since the project is contained in a legislated REDZ, the Environmental Application Process will follow a Basic Assessment process.

Before any of the above-mentioned listed activities can be undertaken, authorisation must be obtained from the relevant authority, in this case the DEA. 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 activity.

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 NSBA 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 regardless of the extent of transformation that will occur. **Roan 2 PV falls within two vegetation types with a status of Least Concern and Endangered.**

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).

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.

Roan 2 PV is located in the Klerksdorp Thornveld (Least concern) and Vaal – Vet Sandy Grassland (Endangered) vegetation types.

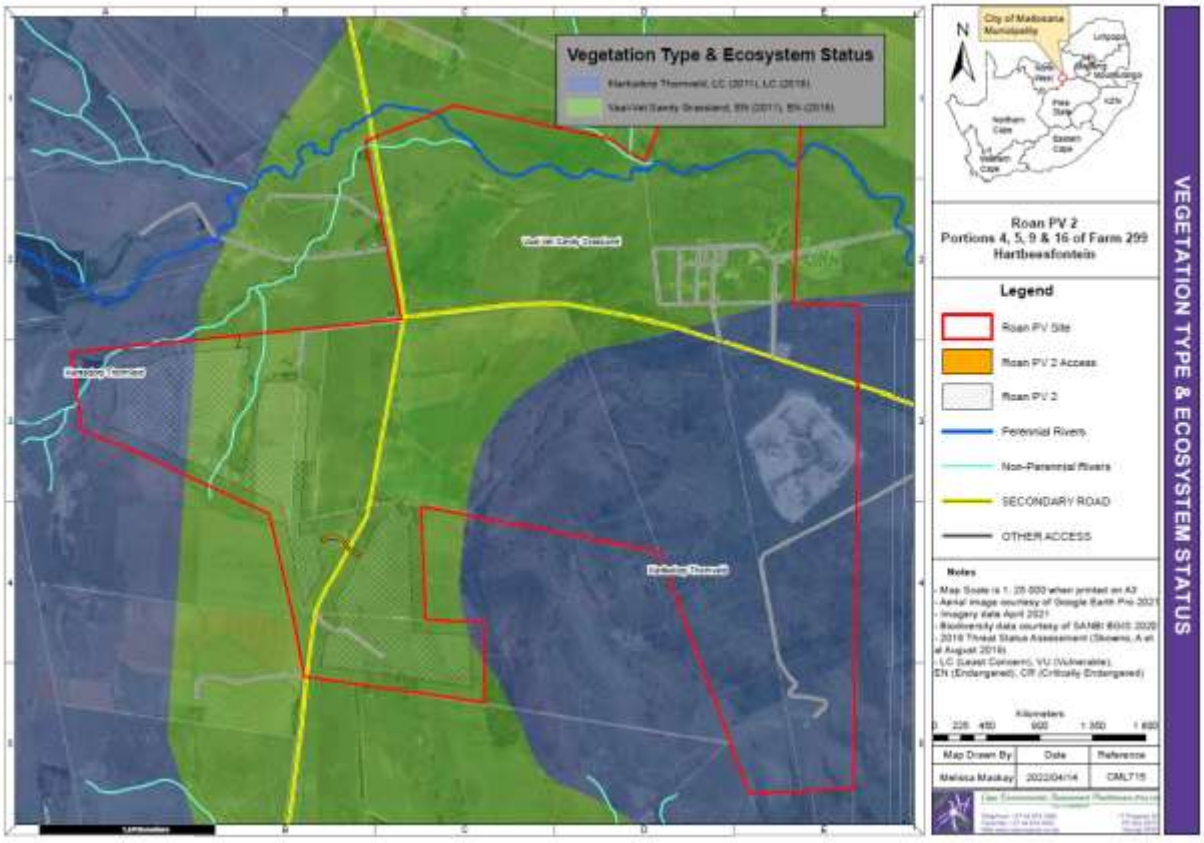

Figure 34: Vegetation Type and Ecosystem Status for Roan 2 PV.

The ecology specialist confirmed that Vaal-Vet Sandy Grassland vegetation type (an endangered vegetation type), is mapped for parts of the site. During surveys at the site, it was found that the original vegetation type is modified at large parts of the site and that the scope to conserve the small more natural remaining grassland at the site as a conservation area for the vegetation type, is small.

The Terrestrial biodiversity specialist furthermore confirmed that there is little scope for most of the site to be part of a corridor of particular conservation importance.

The Attributes of these two vegetation types are shown below:

3.1.3.1 Gh 10 Vaal-Vet Sandy Grassland

Distribution: In South Africa the Vaal-Vet Sandy Grassland is present in the North-West Province and Free State Province. Vaal-Vet Sandy Grassland ranges from south of Lichtenburgand Ventersdorp to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort areas north of Bloemfontein. Altitude ranges from 1 220 – 1560 m for the entire vegetation type (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains-dominated landscape with some scattered, slightly undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element are present. Dominance of Themeda triandra is an important feature of this vegetation unit. Locally low cover of Themeda triandra and the associated increase in Elionurus muticus, Cymbopogon pospischilii and Aristida congesta is attributed to heavy grazing and/or erratic rainfall. Geology and soils: Aeolian and colluvial sand overlying sandstone, mudstone, and shale of the Karoo Supergroup (mostly the Ecca group) as well as older Ventersdorp Supergroup and basement gneiss in the north (Mucina & Rutherford 2006).

Climate: Warm-temperate, summer-rainfall climate, with overall mean annual precipitation of 530 mm. High summer temperatures. Severe frost (37 days per year on average) occurs in winter (Mucina & Rutherford 2006).

Important taxa of the Vaal-Vet Sandy Grassland listed by Mucina & Rutherford (2006): Graminoids: Anthephora pubescens, Aristida congesta, Chloris virgata, Cymbopogon caesius, Cynodon dactylon, Digitaria argyrograpta, Elionurus muticus, Eragrostis chloromelas, Eragrostis lehmanniana, Eragrostis plana, Eragrostis trichophora, Heteropogon contortus, Panicum gilvum, Setaria sphacelata, Themeda triandra, Tragus berteronianus, Brachiaria serrata, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis curvula, Eragrostis obtusa, Eragrostis superba, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Stachys spathulata, Barleria macrostegia, Berkheya onopordifolia var. onopordifolia, Chamaesyce inaequilatera, Geigeria aspera var. aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora, Vernonia oligocephala. Geophytic Herbs: Bulbine narcissifolia, Ledebouria marginata. Succulent Herb: Tripteris aghillana var. integrifolia. Low shrubs: Felicia muricata, Pentzia globosa, Anthospermum rigidum subsp. pumilum, Helichrysum dregeanum, Helichrysum paronychioides, Ziziphus zeyheriana.

3.1.3.2 Klerksdorp Thornveld (Gh 13)

Distribution: In South Africa the Klerksdorp Thornveld is present in the North West Province in two sets of patches, one in the Wolmaransstad, Ottosdal and Hartbeesfontein region, and the other from the Botsalano Game Park north of Mafikeng in the vicinity of Madibogo in the south. Altitude for the entire vegetation type is 1260 – 1580 m (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains or slightly irregular undulating plains with open to dense Acacia karroo bush clumps in dry grasslands (Mucina & Rutherford 2006). Geology and soils: Shale, slate and quartzite of the Pretoria Group with interlaid diabase sills and Hekpoort lava supporting relatively shallow and rocky soils (Glenrosa and Mispah forms). Equally represented are eutrophic red plinthic soils (Hutton form) derived mainly from a thick succession of volcanics and sediments of the Ventersdorp Supergroup (Mucina & Rutherford 2006).

Climate: Warm-temperate, summer-rainfall region, with overall mean annual precipitation of 533 mm. Summer temperatures are high. Frequent frosts occur in winter (Mucina & Rutherford 2006).

Important taxa of the Klerksdorp Thornveld listed by Mucina & Rutherford (2006): Small Trees: Acacia karroo, Acacia caffra, Celtis africana, Searsia lancea, Ziziphus mucronata. Tall Shrubs: Acacia hebeclada, Diospyros lycioides subsp. lycioides, Ehretia rigida, Grewia flava, Gymnosporia buxifolia, Searsia pyroides, Tarchonanthus camphoratus. Woody Climber: Asparagus africanus. Low Shrubs: Asparagus laricinus, Asparagus suaveolens, Felicia muricata, Anthospermum hispidulum, Anthospermum rigidum subsp. pumilum, Aptosimum elongatum, Gnidia capitata, Gomphocarpus fruticosus subsp. fruticosus, Helichrysum dregeanum, Leucas capensis, Pavonia burchellii, Pentzia globosa, Solanum supinum var. supinum, Triumfetta sonderi, Ziziphus zeyheriana. Graminoids: Aristida congesta, Cynodon dactylon, Eragrostis lehmanniana, Eragrostis trichophora, Microcloa caffra, Panicum coloratum, Sporobolus fimbriatus, Themeda triandra, Andropogon shirensis, Anthephora pubescens, Aristida junciformis subsp. galpinii, Aristida stipitata subsp. graciliflora, Brachiaria nigropedata, Brachiaria serrata, Bulbostylis burchellii, Cymbopogon pospischilii, Digitaria eriantha, Diheteropogon amplectens, Elionurus muticus, Eragrostis curvula, Eragrostis obtusa, Eragrostis racemosa, Eragrostis superba, Eustachys paspaloides, Heteropogon contortus, Setaria sphacelata, Sporobolus africanus, Tragus berteronianus, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Acalypha angustata, Acanthospermum australe, Berkheya onopordifolia var. onopordifolia, Berkheya setifera, Blepharis integrifolia var. clarkei, Chamaesyce inaequilatera, Chascanum adenostachyum, Dicoma macrocephala, Helichrysum nudifolium var. nudifolium, Hermannia lancifolia, Hibiscus pusillus, Justicia anagalloides, Lippia scaberrima, Nidorella microcephala, Nolletia ciliaris, Pollichia campestris, Rhyncosia adenodes, Salvia radula, Selago densiflora, Teucrium trifidum, Tolpis

capensis. Geophytic Herbs: Bulbine narcissifolia, Ledebouria marginata, Ornithogalum tenuifolium subsp. tenuifolium, Raphionacme hirsuta. Herbaceous Climber: Rhynchosia venulosa.

3.1.4 Conservation of Agricultural Resources Act – CARA (Act 43 of 1983):

The Conservation of Agricultural Resources Act (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. CARA 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 the Roan 2 PV site is very low. The ecological specialist has however confirmed that alien invasive succulent tree Opuntia ficus-indica occurs in some places.

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 applicant is required to take note of the following:

Article 7.(3)b of Regulation 9238: Conservation of Agriculture Resources, 1983 (Act 43 of 1983) deals with the 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”.

Kindly refer to the Aquatic Biodiversity Impact Assessment in Appendix E2 for a discussion of potential impacts on the freshwater resources on site. The preferred footprint for Roan 2 PV has been developed in such a was as to avoid all surface water resources.

3.1.5 The Subdivision of Agricultural Land, Act 70 Of 1970

The Subdivision of Agricultural Land Act 70 of 1970 (SALA”) came into operation on 2 January 1971. The Department of Agriculture administers the Subdivision of Agricultural Land Act No. 70 of 1970. Subdivision of agricultural land, therefore, requires consent from the Department of Agriculture.

The Department of Agriculture is considered a commenting authority on this environmental process, but will be a decision-making authority on the SALA application which will take place after the project receives an EA.

3.1.6 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.

Section 21(a) of the National Water Act is related to the abstraction of water from a water resource (including abstraction of groundwater); a Water Use Licence (WUL) would be required for such abstraction.

Water required for the construction and operation of Roan 2 PV is to be sourced from the City of Matlosana Local Municipality who will be engaged to provide comment on availability. Should the

applicant in the future, wish to utilise groundwater for the purposes of construction or operation of the facility, such use will require a licence in terms of Section 21(a) of the NWA.

The specialist identified a in channel dams and non perennial rivers preliminary Development Area (The Preferred Layout, Layout Alternative 1 has been specifically designed to avoid this).

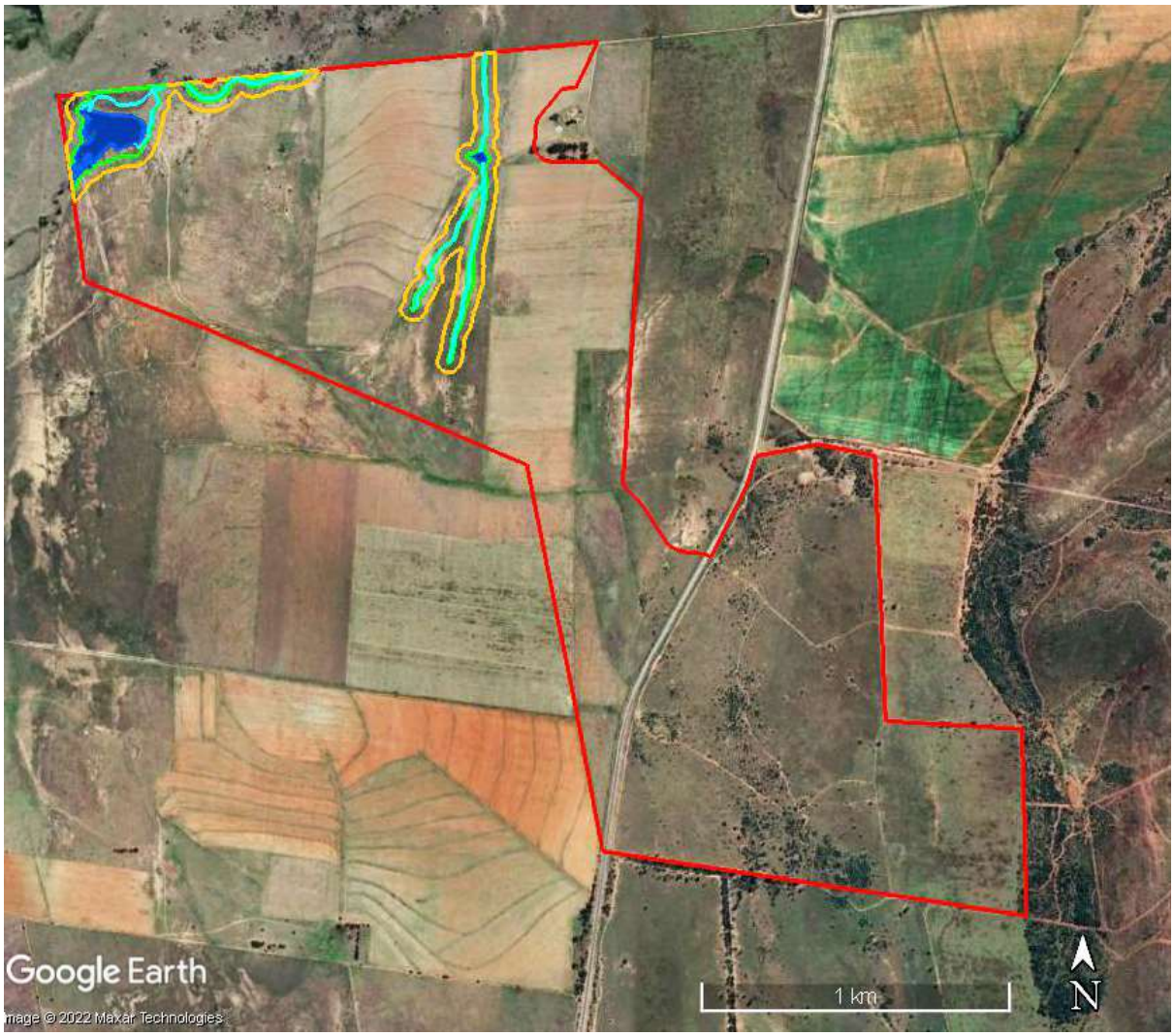

Figure 35: Indication of non-perennial rivers, in-channel dams, with their riparian zones and buffer zones (30 m), at the site. (Terblanche, 2022)

Figure 36: Excerpt from Layout Plan showing how Layout Alternative 1, avoids the The in-stream dams, non perennial rivers and their associated buffers.

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

The National Forests Act (NFA) 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 the Protected Vachellia erioloba is present on the site.

Table 9: Tree species of the North West Province which are listed as Protected Species under the National Forests Act No. 84 of 1998, Section 15(1)**.**

Species	Conservation status	Resident at the site
Boscia albitrunca (Sheppard's tree)	Protected	No
Combretum imberbe (Leadwood)	Protected	No
Sclerocarya birrea (Marula)	Protected	No
Securidaca longepedunculata (Violet Tree)	Protected	No
Vachellia erioloba (Camel Thorn Tree)	Protected	Yes

3.1.8 National Heritage Resources Act, 25 of 1998

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

In terms of Section 38 of the National Heritage Resources Act, Heritage North West 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 300 m in length;
- any development or other activity which will change the character of a *site* exceeding 5 000 m² in extent; and
- the re-zoning of a site exceeding 10 000 m^2 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 (in this case, Heritage North West).

- In terms of Section 36 (3), no person may 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 this case, Heritage North West).
- 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 (In this Case, Heritage North West).

Mr Jaco Van der Walt of Beyond Heritage prepared a heritage impact assessment (Annexure E5).

This Heritage Impact Assessment along with this Draft Basic Assessment Report will be submitted to SAHRA via their SAHRIS system for comment in terms of section 38 of the National Heritage Resources Act.

3.1.9 National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008) is 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; while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies.

The objectives of the Act, are to amongst other things, to:

- Ensure uninterrupted supply of energy to the Republic.
- Promote diversity of supply of energy and its sources.
- Facilitate energy access for improvement of the quality of life of the people of the Republic.
- Contribute to the sustainable development of South Africa's economy.

The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life. The Act provides the legal framework which supports the development of Renewable Energy facilities for the greater environmental and social good and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place.

3.2 PROVINCIAL LEGISLATION

This section deals with provincially promulgated or provincially applicable legislation associated with the proposed Roan 2 PV [33].

3.2.1 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.

Chapter 2 of the act allows for the declaration of astronomy advantage areas whilst Chapter 3 pertains to the management and control of astronomy advantage areas. Management and control of astronomy advantage areas include, amongst others, the following:

- Restrictions on use of radio frequency spectrum in astronomy advantage areas;
- Declared activities in core or central astronomy advantage area;
- Identified activities in coordinated astronomy advantage area; and
- Authorisation to undertake identified activities.

The Roan 2 PV facility is not within the Geographic Advantage Area, as it is situated outside of the Northern Cape. It was furthermore found to be situated more than 560km from the closest SKA station (SKA004).

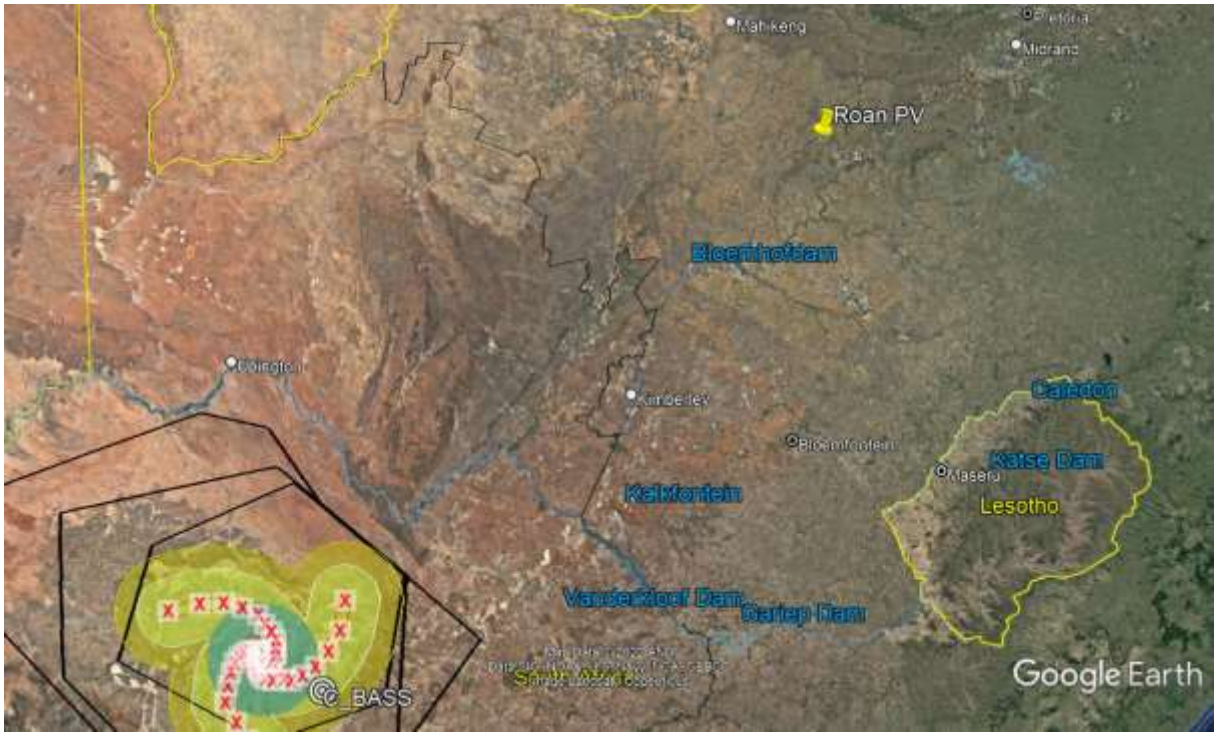

Figure 37: Proposed Roan 2 PV in relation to the SKA Declared Areas

[33] This section includes input from the Social specialist (Annexure E9)

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

3.2.2 North West Provincial Development Plan (PDP) 2030 (2013)

The North West Provincial Development Plan (PDP), 2030, is largely based on, and intended to apply the objectives of, the National Development Plan (NDP) 2030. The overall targets of the PDP have been identified as follows:

By 2030:

- Eliminate income poverty: reduce the percentage of the population living in poverty from 46% to 0% in 2030.
- Reduce inequality: the Gini coefficient should fall from 0.61 to 0.53.
- The targets for poverty reduction and the GINI coefficient compliments the national targets set out for the elimination of poverty and reduction of inequality.
- The unemployment rate should fall from 24% in 2010 to 14% by 2020 and to 6% by 2030. This requires an additional 815 000 jobs. Total employment should rise from 748 000 to 1 563 000.
- The NDP projects that total employment should rise from 13 million to 24 million in South-Africa. 7% of additional jobs that has to be created will be located in the North West Province. By 2030 the North West will be responsible for 6.5% of employment in South-Africa.
- The provincial Gross Value Added (GVA) should increase by 2.9 times in real terms. Such growth will require an average annual Gross Value Added (GVA) growth of 5.4%.

The development of Roan 2 PV has the potential to contribute towards a number of the targets set by the PDP, including:

- Job creation and increased income, which would have a positive impact on the current unemployment rate, standard of living, levels of inequality, and poverty levels within the Province.
- Contribute towards the capita income, and improve on labour force participation rates.
- Production of clean energy.

3.2.3 North West Provincial Growth and Development Strategy (PGDS) 2004 - 2014

The North West Provincial Growth and Development Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the province and its people. Challenges facing the Province can be summarised as follows: the Province is mostly rural in nature; has a low population density, and relative inadequate infrastructure, especially in the remote rural areas; has inherited an enormous backlog in basic service delivery and maintenance that will take time to eradicate; the population is predominantly poor with high levels of illiteracy and dependency that seriously affect their productivity and ability to compete for jobs; is characterised by great inequalities between the rich and poor as well as disparities between urban and rural; is faced with HIV / AIDS as a social and economic challenge; available resources are unevenly distributed, and there is limited potential for improved delivery of services and growth. From the above, job creation and poverty eradication together with the low level of expertise and skills; stand out as the greatest challenges to be resolved within the Province.

Goals and objectives of the PGDS are to fight poverty and unemployment, improve the low level of expertise and skills which are classified as both immediate and long term goals and require primary goals for sustained growth and economic development. The proposed solar farm will contribute to employment creation and skills development which is in line with the goals and objectives of the North West PGDS.

The North West PGDS aims at building a sustainable economy to eradicate poverty and improve social development. The proposed solar farm will contribute to growth and development of the local area by expanding the economic base and creating employment opportunities.

Renewable Energy Strategy for the North West Province (2012) In 2012 the North West Province's then Department of Economic Development, Environment, Conservation and Tourism (DEDECT) developed the Renewable Energy Strategy for the North West Province. The strategy was developed in response to the need of the North West Province to participate meaningfully within South Africa's RE sector. The RE strategy aims to improve the North West Province's environment, reduce its contribution to climate change, and alleviate energy poverty, whilst promoting economic development and job creation whilst developing its green economy.

According to the strategy the North West Province consumes approximately 12% of South Africa's available electricity, and is rated as the country's fourth largest electricity consuming province. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector, with approximately 63% of the electricity supplied to the province being consumed in its mining sector.

While the strategy recognises that South Africa has an abundance of RE resources available, it is cognisant of the fact that the applicability of these RE resources depend on a number of factors and as a result are not equally viable for the North West Province. The RE sources that were identified to hold the most potential and a competitive strength for the North West Province are Solar Energy (photovoltaic as well as solar water heaters), Municipal Solid Waste, hydrogen and fuel cell technologies, bio-mass, and energy efficiency.

The advantages and benefits for the North West Province associated with the implementation and use of RE technologies include:

- Provision of energy for rural communities, schools and clinics that are far from the national electricity grid.
- Creation of an environment where access to electricity provides rural communities with the opportunity to create an economic base via agricultural and home-based industries and Small, Medium and Micro Enterprises (SMMEs) in order to grow their income-generating potential.
- The supply of water within rural communities.
- It would result in less time taken for the collection of wood and water, thus improving the quality of life within communities and specifically for women.
- Improved health through the reduced use of fuelwood as energy source for cooking and heating that causes respiratory and other hazards.
- Solar water heating for households in urban and rural settings, reducing the need for either electricity (in urban settings) and fuelwood (in rural settings) to heat water, thus lowering our National peak demand and conservation of woodlands in a sustainable manner.
- Large-scale utilisation of renewable energy will also reduce the emissions of carbon dioxide, thus contributing to an improved environment.
- The fact that RE go hand-in-hand with energy efficiency, it will result in additional financial benefit and the need for smaller RE systems.
- The development of a strong localised RE industry within the NWP holds substantial potential for Black Economic Empowerment (BEE) and job creation within the Province.
- The establishment of a strong RE base in the North West Province, especially in the manufacturing of fuel cells could stimulate the market for Platinum Group Metals (PGM), which would in turn help the local mining sector.

This is due to RE sources having considerable potential for increasing security of supply by diversifying the energy supply portfolio and increasingly contributes towards a long-term sustainable energy future. In terms of environmental impacts, RE results in the emission of less GHGs than fossil fuels, as well as fewer airborne particulates, and other pollutants. Furthermore, RE generation technologies save on water consumption in comparison with coal-fired power plants.

3.2.4 North West Provincial Spatial Development Framework (2017)

As per the North West Provincial Spatial Development Framework (PSDF) (2017) electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%). Electricity for supply to the North West Province is mostly generated by Eskom's Matimba coal-fired Power Station in Limpopo which will in future be augmented by Eskom's Medupi coal-fired Power Station.

According to the North West PSDF the proposed project site is located within the Mahikeng Distribution Area, which is characterised by minor developments, including Commercial, Industrial, and Major Electrification; and has a projected growth of 125MW (Eskom, 2015).

Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10 year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400kV power lines and transformation to support or relieve the existing networks. Five transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements.

3.2.5 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, for following key actions are proposed for the NWP with regard to Solar PV:

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

3.3 REGIONAL AND MUNICIPAL LEGISLATION

This section deals with regionally and municipally promulgated or regionally or municipally applicable legislation associated with the proposed Roan 2 PV [34][35].

3.3.1 Dr Kenneth Kaunda District Municipality Integrated Development Plan (IDP), 2017 – 2022

The objectives of the Spatial Development Framework (SDF) of Dr Kenneth Kaunda DM are:

- Diversification of the economic base
- Accelerating growth in agriculture, tourism, industries, and export sectors (metals, clothing, textiles, agro-processing, mineral beneficiation and manufacturing
- Innovation and competitiveness in manufacturing sector is manufacturing sector is critical component in the strategy to significantly increase the potential of the manufacturing sector to contribute towards the overall development of the district
- Ensure sustainability by identifying possible conflict zones between proposed development and environmental sensitive areas
- Bringing marginalized communities into economic mainstream
- SMME development and skills development
- Strengthening and concentration of developments along N12

[34] This section includes input from the Social specialist (Annexure E9)

[35] This section includes legislation applicable to both the District (Category C) and Local (Category B) municipalities.

- Identification of available land and infrastructure to accommodate development along the corridor

The vision of Dr Kenneth Kaunda District Municipality (DKKDM) is to be a catalyst for Economic Development in the region of the North West Province, benefitting all communities in the designated area of jurisdiction. The goal is to assist municipalities with the implementation of key local economic development projects, by championing investment in or supporting business development for selected high impact projects to stimulate economic growth, job creation and economic diversification in the district region.

The proposed solar energy facility falls in line with the SDF within the IDP. The development will contribute to assisting the District Municipality in achieving economic growth and building a sustainable economy through the field of renewable energy.

3.3.2 City of Matlosana Integrated Development Plan (IDP), 2017 – 2022

The City of Matlosana Integrated Development Strategy focuses on the following issues:

- The regeneration of the manufacturing sector
- The growth of tourism and the linkages to the sector
- The growth of agriculture
- The development and growth of the information technology sector
- The re-skilling of the labour force
- The regeneration of industrial areas and CBD's and upgrade of residential areas
- Facilitate the utilization of co-operatives in the municipality's procurement system
- Facilitate the growth and contribution of SMME's.

The City of Motlosana's IDP has moved from forming to storming then to norming; now they are proceeding to performing. The overarching direction of CMLM IDP articulates a vision for economic growth and development, provision of basic services (service delivery improvement) and infrastructure development. The proposed solar energy facility will contribute to job creation, economic growth and development in the region, which will be KPA 2 of the City of Matlosana IDP.

3.4 GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS

This section includes relevant Guidelines, Policies and Authoritative reports applicable to the proposed Roan 2 PV.

3.4.1 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.

The NPAES identifies 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 protected area is the Faan Meintjies Nature Reserve situated more than 25km from the site.

The closest focus area is the Vaal Grasslands Focus Area situated approximately 10km's South of the Study Site. The proposed Roan 2 PV will not affect this or any other NPAES focus area as it is situated considerable distance from the Upper Karoo Focus Area.

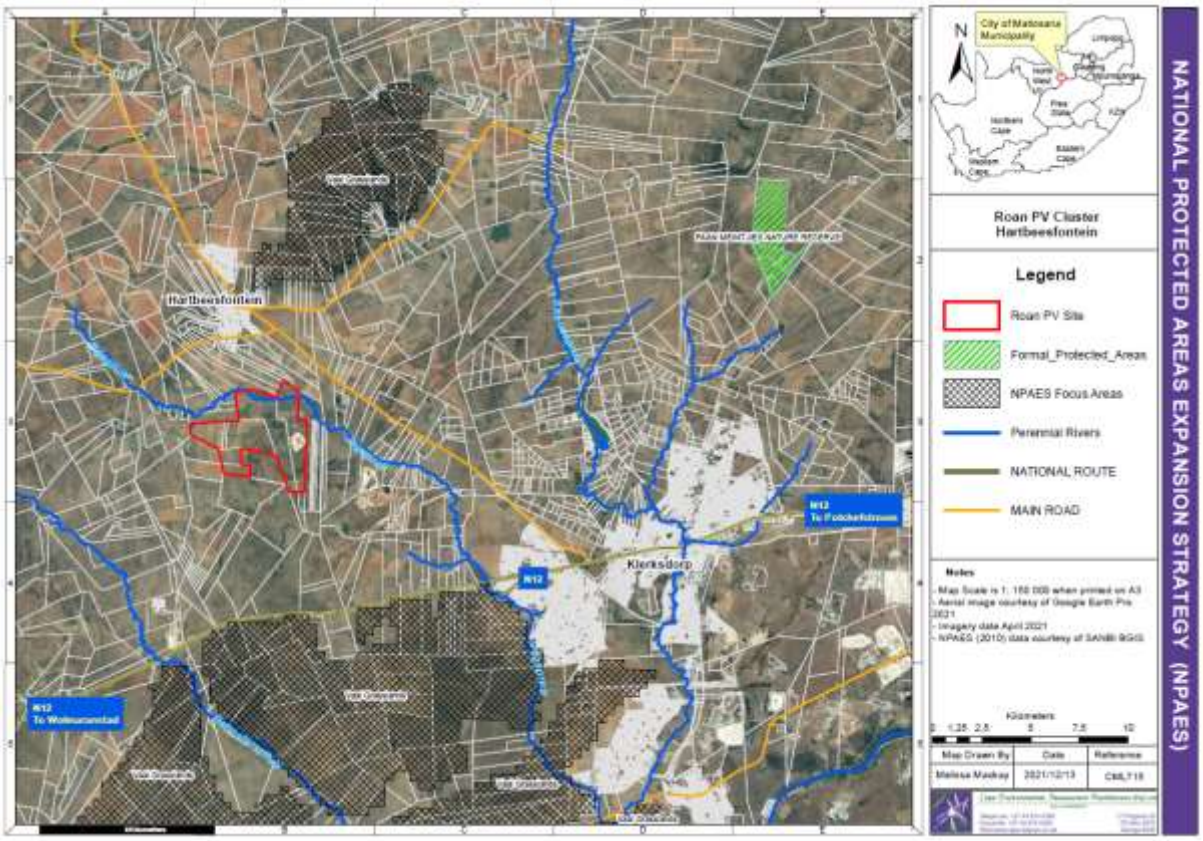

Figure 38: Roan 2 PV in relation to the NPAES Expansion Areas.

3.4.2 North West Province Biodiversity Sector Plan (2017)

A Critical Biodiversity Areas (CBA) Map is a spatial plan for ecological sustainability. It identifies a set of biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

The North West Biodiversity Sector Plan gives legal status to the CBA Map through the National Environmental Management: Biodiversity Act (Act 10 of 2004),

The North West Biodiversity Spatial Plan classifies areas into Critical Biodiversity Areas (CBA1), Degraded Critical Biodiversity Areas (CBA2), Ecological Support Areas (ESA1 &ESA2), Other Natural Areas (ONA) and Protected Areas (PA). The figure below shows that the Roan 2 PV overlaps with areas classified as:

- CBA1;
- CBA2 degraded; and
- ONA.

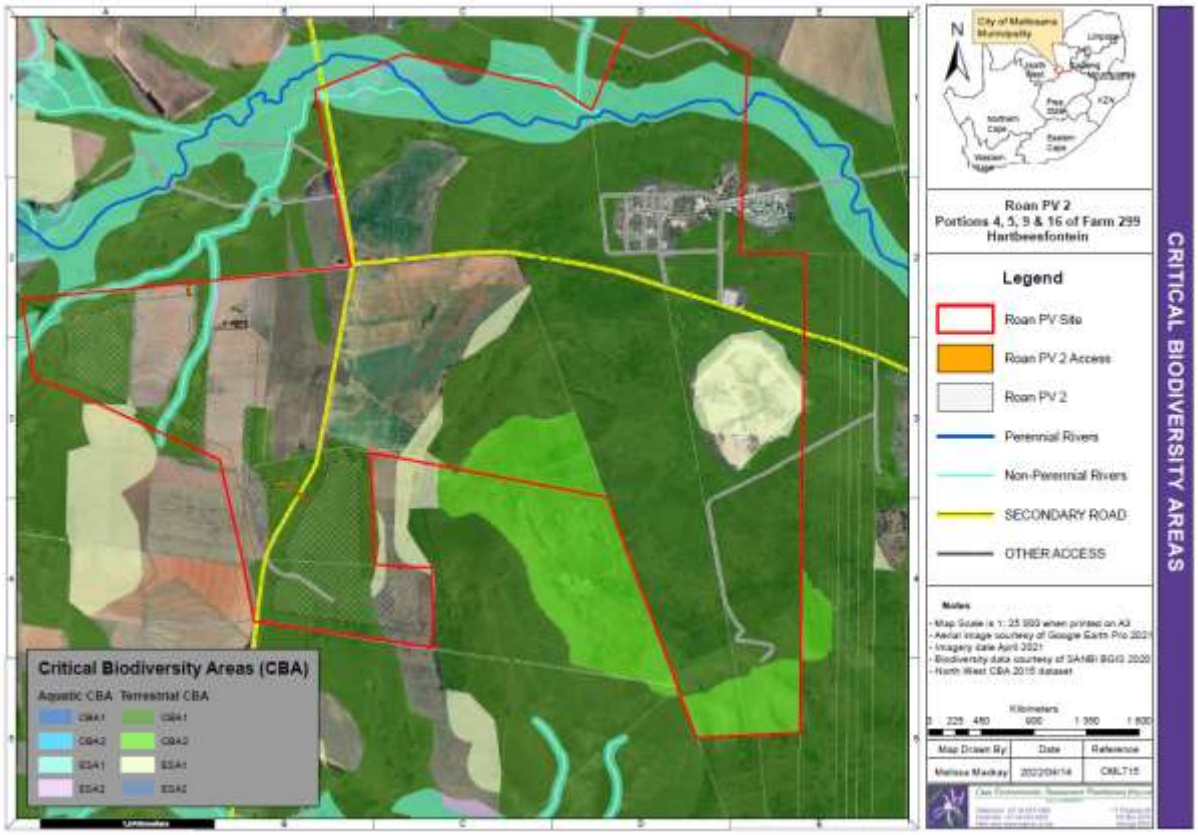

Figure 39: Roan 2 PV in relation to Critical Biodiversity Areas.

The Ecological Specialist (Annexure E1) has confirmed that the main basis of the CBA's at the site is the presence of an Endangered ecosystem, the Vaal-Vet Sandy Grassland vegetation type. During surveys at the site, it was found that the original vegetation type is modified at large parts of the site and that the scope to conserve the small more natural remaining grassland at the site as a conservation are for the vegetation type, is small.

3.4.3 White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)

The White Paper on Renewable Energy Policy of 2003 supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of Renewable Energy and aims to create the necessary conditions for the development and commercial implementation of Renewable Energy technologies. The position of the White Paper on Renewable Policy is based on the integrated resource planning criterion of:

"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."

The White Paper on Renewable Energy Policy sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing Renewable Energy in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and fairly accessible and affordable coal resources. However, massive Renewable Energy resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. The White Paper on Renewable Energy Policy fosters the uptake of Renewable Energy in the economy and has a number of objectives that include: ensuring equitable resources are invested in renewable technologies; directing public resources for

implementation of Renewable Energy technologies; introducing suitable fiscal incentives for Renewable Energy and; creating an investment climate for the development of the Renewable Energy sector.

The White Paper on Renewable Energy Policy set a target of 10 000GWh to be generated from Renewable Energy by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the Renewable Energy summit of 2009. The objectives of the White Paper on Renewable Energy Policy are considered in six focal areas, namely; financial instruments, legal instruments, technology development, awareness raising, capacity building and education, and market based and regulatory instruments. The policy supports the investment in Renewable Energy facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of Renewable Energy sources.

3.4.4 White Paper on the Energy Policy of the Republic of South Africa (1998)

The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of renewable energy and encouraging new entries into the generation market. South Africa has an attractive range of cost-effective renewable resources, taking into consideration social and environmental costs. 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.
- Addressing constraints on the development of the renewable industry.

The policy states that the advantages of Renewable Energy include; minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include; higher capital costs in some cases; lower energy densities; and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. The White Paper on Energy Policy therefore supports the advancement of Renewable Energy sources and ensuring energy security through the diversification of supply.

3.4.5 Integrated Energy Plan, 2016

The development of a National Integrated Energy Plan 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 Integrated Energy Plan in the Government Gazette. The purpose of the Integrated Energy Plan is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The Integrated Energy Plan notes that South Africa needs to grow its energy supply to support economi**c 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; and
- Objective 8: Increase access to modern energy.

The Integrated Energy Plan 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 take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others.

Based on this information the Integrated Energy Plan 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 Integrated Energy Plan 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, are met.

The Integrated Energy Plan 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.

3.4.6 Integrated Resource Plan for Electricity (2010-2030)

The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the Integrated Energy Plan and constitutes South Africa's national electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.

The current iteration of the IRP, led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November / December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost-optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation.

The Policy-Adjusted IRP reflects recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear; 6.25GW of coal; 17.8GW of renewables; and approximately 8.9GW of other generation sources such as hydro, and gas.

3.4.7 National Development Plan 2030 (2012)

The National Development Plan 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. The National Development Plan aims to achieve this by drawing on the energies of its people, growing and inclusive economy, building capabilities, enhancing the capacity of the state and promoting leaderships and partnerships throughout society. While the achievement of the objectives of the National Development Plan requires progress on a broad front, three priorities stand out, namely:

- Raising employment through faster economic growth.
- Improving the quality of education, skills development and innovation.
- Building the capability of the state to play a developmental, transformative role.

In terms of the Energy Sectors role in empowering South Africa, the National Development Plan envisages that, by 2030, South Africa will have an energy sector that promotes:

- Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

The National Development Plan aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The proposed project will assist in reducing carbon emissions targets and creating jobs in the local area as well as assist in creating a competitive infrastructure based on terms of energy contribution to the national grid.

3.4.8 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.

3.4.9 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 strengthen 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 that are related to Roan 2 PV are SIP 8, 9 and 10.

Table 10: Strategic Infrastructure applicable to Roan 2 PV

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.

Although this project aligns with these 3 SIP's, it will only receive formal SIP status once it is selected as a preferred bidder under the REIPPPP.

3.4.10 Strategic Environmental Assessment (SEA) for Wind and Solar PV energy in South Africa

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013) identified eight (8) Renewable Development Zones (REDZs). The REDZs identified areas where large scale renewable energy facilities can be developed in in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country.

The Phase 2 SEA identified a further 3 REDZ, which were formally gazetted in 2021. The Roan 2 PV site is located within the Klerksdorp REDZ, which was formally gazetted as part of the Phase 2 REDZ in 2021. The area has therefore been identified as suitable for the establishment of renewable energy facilities, specifically large-scale solar farms.

3.4.11 Conservation of Migratory Species of Wild Animals

Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) is an intergovernmental treaty and is the most appropriate instrument to deal with the conservation of terrestrial, aquatic and avian migratory species. The convention includes policy and guidelines with regards to the impact associated with man-made infrastructure. CMS requires that parties (South Africa is a signatory) take measures to avoid migratory species from becoming endangered (Art II, par. 1 and 2) and to make every effort to prevent the adverse effects of activities and obstacles that seriously impede or prevent the migration of migratory species i.e., power lines (Art 111, par. 4b and 4c).

An Avifaunal Specialist has been appointed to consider the impact of the proposed Roan 2 PV as well as the powerline connecting the facility to the Eskom Roan Substation (Annexure E2). Birdlife Africa South Africa has also been given an opportunity to comment in this regard.

3.4.12 The Agreement on the Convention of African-Eurasian Migratory Water Birds

The Agreement on the Conservation of African-Eurasian Migratory Water birds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitat across Africa, Europe, the Middle East Central Asia, Greenland and the Canadian Archipelago. The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle and is a legally binding agreement by all contracting parties (South Africa included) to guarantee the conservation of migratory waterbirds within their national boundaries through species and habitat protection and the management of human activities. As mentioned above, an Avifaunal Specialist has been appointed to consider the impact of the proposed Roan 2 PV as well as the powerline connecting the facility to the Eskom Roan Substation (Annexure E3). Birdlife Africa South Africa has also been given an opportunity to comment in this regard.

3.4.13 Guidelines to minimise the impacts on birds of Solar Facilities and Associated Infrastructure in South Africa

The "Guidelines to minimise the impact on birds of Solar Facilities and Associated Infrastructure in South Africa" (Smit, 2012) is perhaps the most important (although not legally binding) document from an avifaunal impact perspective currently applicable to solar development in South Africa. The guidelines are published by BirdLife South Africa (BLSA) and detail the recommended procedure for conducting an avifaunal specialist study as well as list all of the potential impacts of interactions between birds and solar facilities and associated infrastructure. We are aware of changes to the BLSA best-practise guidelines recently published at the Birds and Renewable Energy Forum in Johannesburg (2015) and although the revised requirements are still a work in progress and have not yet been ratified, they will inform this assessment where applicable. Please refer to Annexure E3 for a copy of the Avifaunal assessment undertaken for this project.

3.4.14 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 3 725 MW, 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 11: Potential environmental impacts of solar energy projects (Adapted from DEA, 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 E8.
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 E4
Impacts on Cultural Heritage	NEMA, NHRA	Heritage impact assessment attached in Annexure E4, and E6.
Impacts on Biodiversity	NEMA, NEMBA, NEMPAA, NFA	Biodiversity specialist input attached in Annexure E1 and E2 (Terrestrial Biodiversity and Aquatic 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 E2).
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 nearest SKA station has been identified as SKA 004, at more than 500 km from the proposed Roan 2 PV. SKA have 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 E4
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 (which in this case is a Basic Assessment), 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 this scoping process and where necessary, additional specialist input has been obtained. Please see section 6 of this BAR for a full assessment of impacts.

3.4.15 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.*[36]

It is believed that the proposed 120MW Roan 2 PV 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.

3.4.16 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 NFEPAs 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 the PV Development Footprint (Although some are present within the initial study site. As can be seen in the map below, the preferred alternative, Layout alternative 1 has been specifically designed to avoid the rivers and wetlands. In terms of the preferred layout, a single MV cable crossing will be required for the

36 Refer to definition of "sustainable development" in section 1 of NEMA.

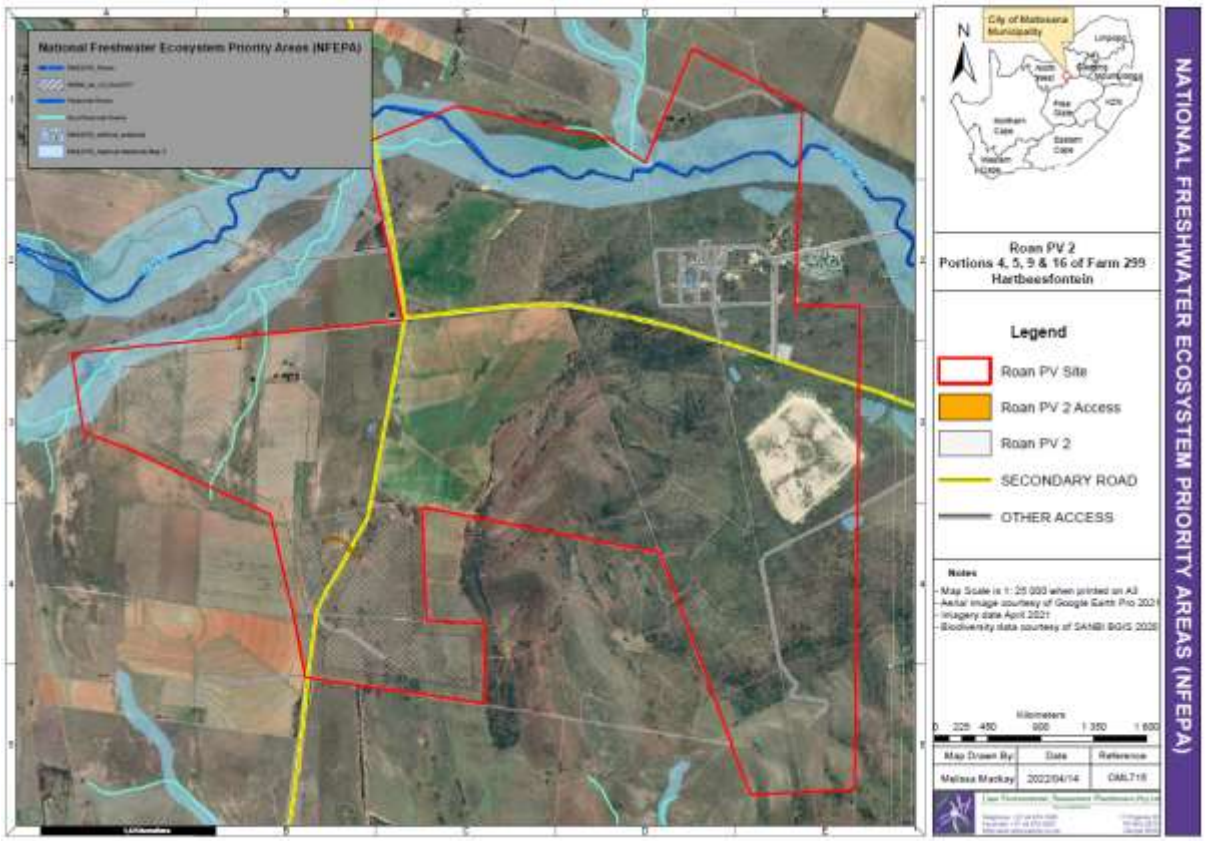

Figure 40: Roan 2 PV in relation to the National Freshwater Ecosystem Priority Areas.

3.4.17 DFFE Screening Tool and Protocols

A screening tool report was generated for the proposed Roan 2 PV and is attached in Appendix I. The outcomes of the various environmental theme's sensitivity as well as the level of study required by the protocols, are summarised in the table below.

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

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
Agriculture Theme	High	Agricultural Impact Assessment	This High theme rating was disputed by the agricultural specialist who confirmed the whole site to be medium, See Annexure E4
Animal Species Theme	Medium	Animal Species compliance statement	This forms part of the Terrestrial Biodiversity Impact Assessment attached in Annexure E1.
Aquatic Biodiversity Theme	Very high	Aquatic Biodiversity Impact Assessment	This forms part of the Aquatic and Wetland Assessment attached in Annexure E2.
Archaeological and Cultural Heritage Theme	Low	Heritage Compliance Statement.	Notwithstanding the low theme sensitivity, a Heritage Impact Assessment has been undertaken and is attached in Annexure E45
Civil Aviation (Solar PV) Theme	Low	Compliance Statement	The South African Civil Aviation Authority will be

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
			provided an opportunity to comment in this regard.
Landscape (Solar) Theme	Very High	Visual and Landscape Impact Assessment	A Visual Impact Assessment has been undertaken and is attached in appendix E7.
Plant Species Theme	Medium	Compliance Statement	This forms part of the Terrestrial Biodiversity Impact Assessment attached in Annexure E1.
RFI Theme	Low	Compliance Statement	The South African Square Kilometre Array SKA-SA and SARAO will be requested to provide professional comment in this regard.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Impact Assessment	The terrestrial biodiversity assessment is attached in annexure E1.

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

Table 13: Specialist Studies recommended in the DEA Screening Tool.

Study Recommended	Discussion
Agricultural Impact Assessment	Has been undertaken. See Annexure 4 of this BAR
Landscape/Visual Impact Assessment	Has been undertaken. See Annexure E7 of this BAR
Archaeological and Cultural Heritage Impact Assessment	Has been undertaken. See Annexures E5 of this BAR
Palaeontology Impact Assessment	Has been undertaken. See Annexure E6 of this BAR
Terrestrial Biodiversity Impact Assessment	Has been undertaken. See Annexure E1 of this BAR
Aquatic Biodiversity Impact Assessment	Has been undertaken. See Annexure 2 of this BAR
Avian Impact Assessment	Has been undertaken. See Annexure E3 of this BAR
Civil Aviation Assessment	Has not been undertaken – The closest airstrip was identified as the Klerksdorp Airfield situated approximately 25 km from the Site. The South Avian Civil Aviation Authority will be given an opportunity to comment on this Basic Assessment Process. The applicant will submit an obstacle application (Part 30-27) to the South African Civil Aviation Authority.
Defence Assessment	Has Not been undertaken – the South African National Defence Force will be provided with an opportunity to comment on this Basic Assessment Process.
RFI Assessment	Has not been undertaken – The Roan 2 PV facility is not within the Geographic Advantage Area, as it is situated outside of the Northern Cape. It was furthermore found to be situated more than 500km from the closest SKA station (SKA004). The South African SKA Project Office and the South African Radio Astronomy Observatory (SARAO) have been registered as a key stakeholder on this environmental process and have been requested to provide input in terms

	of the Astronomy Geographic Advantage Act and potential impact to SKA.
Geotechnical Assessment	Has not been undertaken – The Council for Geoscience will be approached for comment in this regard.
Socio-Economic Assessment	Has been undertaken. See Annexure E8 of this BAR
Plant Species Assessment	Has been undertaken. See Annexure E1 of this BAR
Animal Species Assessment	Has been undertaken. See Annexure E1 of this BAR

4. PLANNING CONTEXT

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

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

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

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

- **North West Nature Conservation** for comment on the land use application.

5. SITE DESCRIPTION AND ATTRIBUTES

The following sections provide a description of the natural environment, built environment and social and economic context of Portions 4,5,9 and 16 of the farm 299, with particular focus on the site location for the proposed Roan 2 PV. The Grid connection is also situated on portion 249 of 297, portion 6 of 299, farm 337 and farm 338

5.1 LOCATION & BUILT ENVIRONMENT

The target property, Portion 0 of the Farm 426, is located in the Dr Kenneth Kaunda District of the North West Province, within the jurisdiction area of the City of Matlosana Local Municipality. The property is approximately 565 hectares in size and is located South of Hartbeesfontein.

The proposed Roan 2 PV is accessed from the main road off the R503 between Klerksdorp and Hartbeesfontein.

According to the heritage specialist, Roan 2 PV Preliminary footprint contains a Degrading mudbrick structure that has been partially overgrown with weeds. The structure is built from clay and mudbrick and shows signs of recent habitation however the structure is currently in an extremely poor condition. Some walls are still intact. This was presumably the dwelling of farm labourers and could contain graves. The features potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and is therefore of low heritage significance unless associated with burial sites in which case the burial sites are of high social significance.

Although this mudbrick structure is within the footprint of the proposed Roan 2 PV, it have been excluded from the PV array, in order to mitigate the impact on graves if they were to occur at the structure.

Figure 41: Showing Mudbrick structure outside of the PV arrays.

5.2 GEOLOGY & SOILS

According to the palaeontology specialist, Prof Marion Bamford (Annexure E6), the PV facility and grid connection lies in the central part of the Kaapvaal Craton, where the Dominion Group, a sequence of volcanic and minor clastic sedimentary rocks has been metamorphosed to greenschist-amphibolite grade. The Dominion Group overlies the granite-greenstone basement terrane, and is in turn overlain by the Ventersdorp Group and Witwatersrand Group.

Overlying these ancient volcanic rocks are considerably younger sands, soils and alluvium of Quaternary age. They might include the southern-most extent of the Kalahari Group sands.

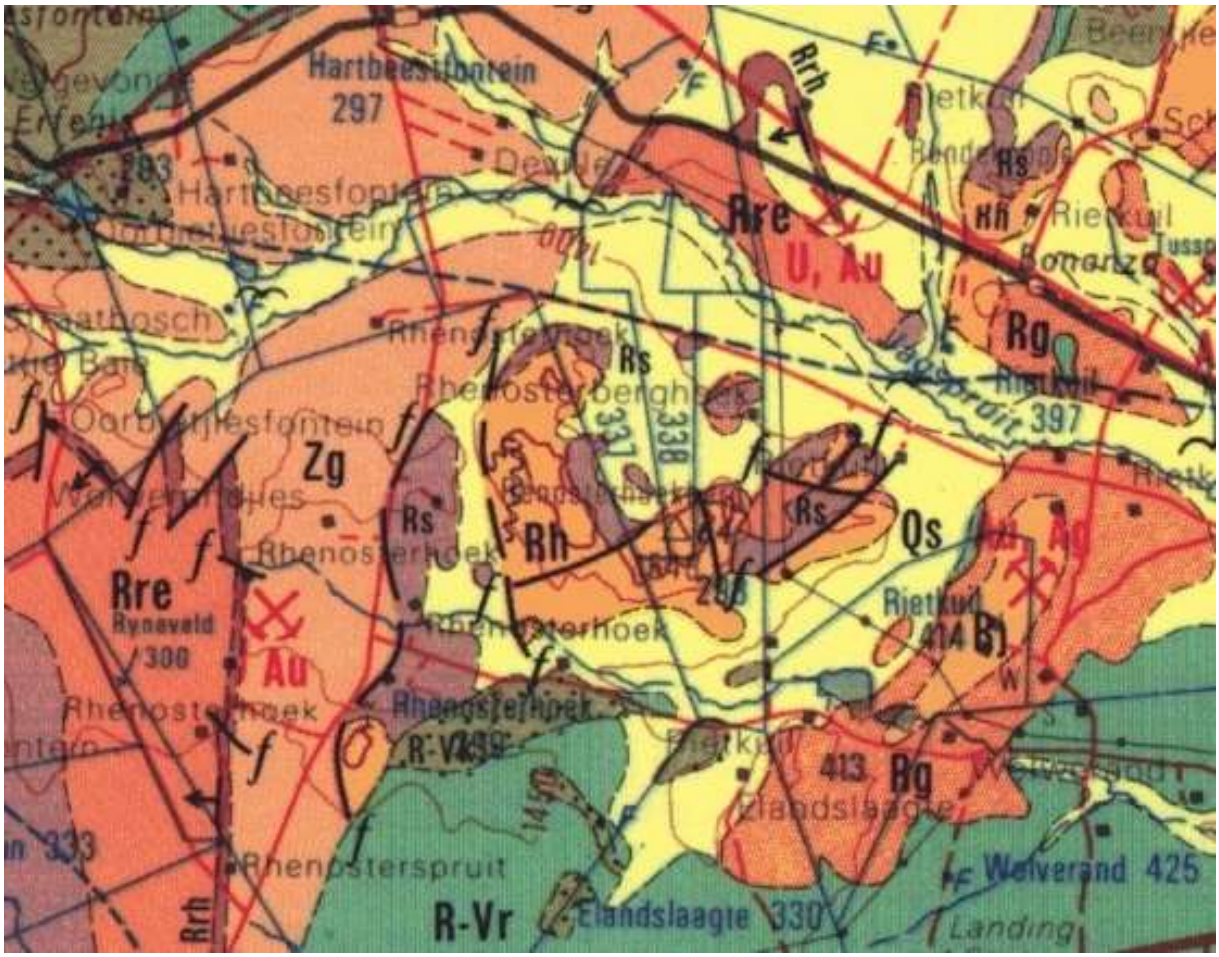

Figure 42: Geological map of the area around the Roan 2 PV sites (Bamford, 2022).

Abbreviations of the rock types are explained in the table below

Table 14: Explanation of symbols for the geological map (Bamford, 2022).

Symbol	Group/Formation	Lithology
Qs	Quaternary	Alluvium, sand, calcrete
R-Vr	Rietgat Subgroup, Ventersdorp SG	Amygdaloidal lava. Agglomerate, tuff
Rj	Jeppestown Subgroup, West Rand Group, Witwatersrand SG	Shale, quartzite, lava
Rg	Government Subgroup, West Rand Group, Witwatersrand SG	Quartzite, shale
Rh	Hospital Hill Subgroup, West Rand Group, Witwatersrand SG	Shale quartzite
Rs	Syferfontein Fm, Dominion Group	Porphyritic lava, cherty lava, tuff, schist
Rre	Renosterhoek Fm, Dominion Group	Grey andesitic lava
Rrh	Renosterspruit Fm Dominion Group	Quartz, conglomerate , schist
Zg	Undifferentiated basement Granite,	Granite, gneiss

According to the Agricultural Specialist, Johan Lanz (Annexure E4) Soils on the higher lying ground and across most of the southern area tend to be shallow, rocky Mispah and Glenrosa soils on hard underlying bedrock. Rock outcrops are common. Soils on the one area of cropland are very sandy, low water holding capacity soils that are limited in depth by a distinct transition to a higher clay content horizon in the subsoil (so-called luvic transition). The subsoil horizon is a soft plinthic horizon and the soils are of the Longlands and Avalon soil forms.

5.3 CLIMATE

The 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.

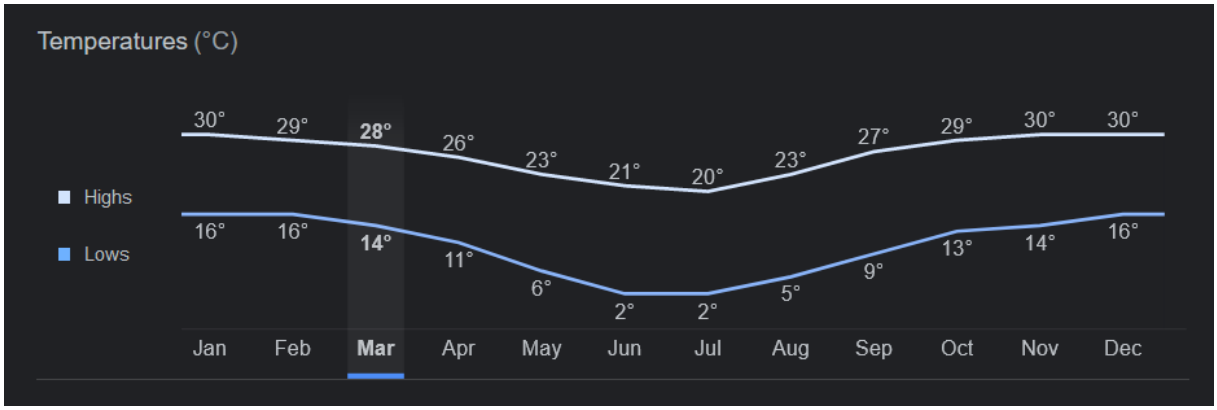

Figure 43: Average monthly temperatures in the project area.

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

Figure 44: Average Monthly Rainfall in the project area.

5.4 TOPOGRAPHY

According to the Visual Specialist, Appendix E7, the minimum elevation is 1361mamsl, the Maximum 1566mamsl and the average 1440mamsl. High ground is to the northwest with drainage to the southeast.

To the north of the development site is a low ridgeline lying in an east-west configuration. The town of Hartbeesfontein is located just south of the ridgeline with the upper northern areas creating a shallow plateau.

The regional terrain is fairly undulating, with the only main hill feature in close proximity to the proposed site being the Renosterberg Hill located to the east of the site with an elevation of 1526mamsl, approximately 100m above the average elevation of the adjacent farming areas.

Figure 45: Elevation Profiles East to West and North to South profiles.

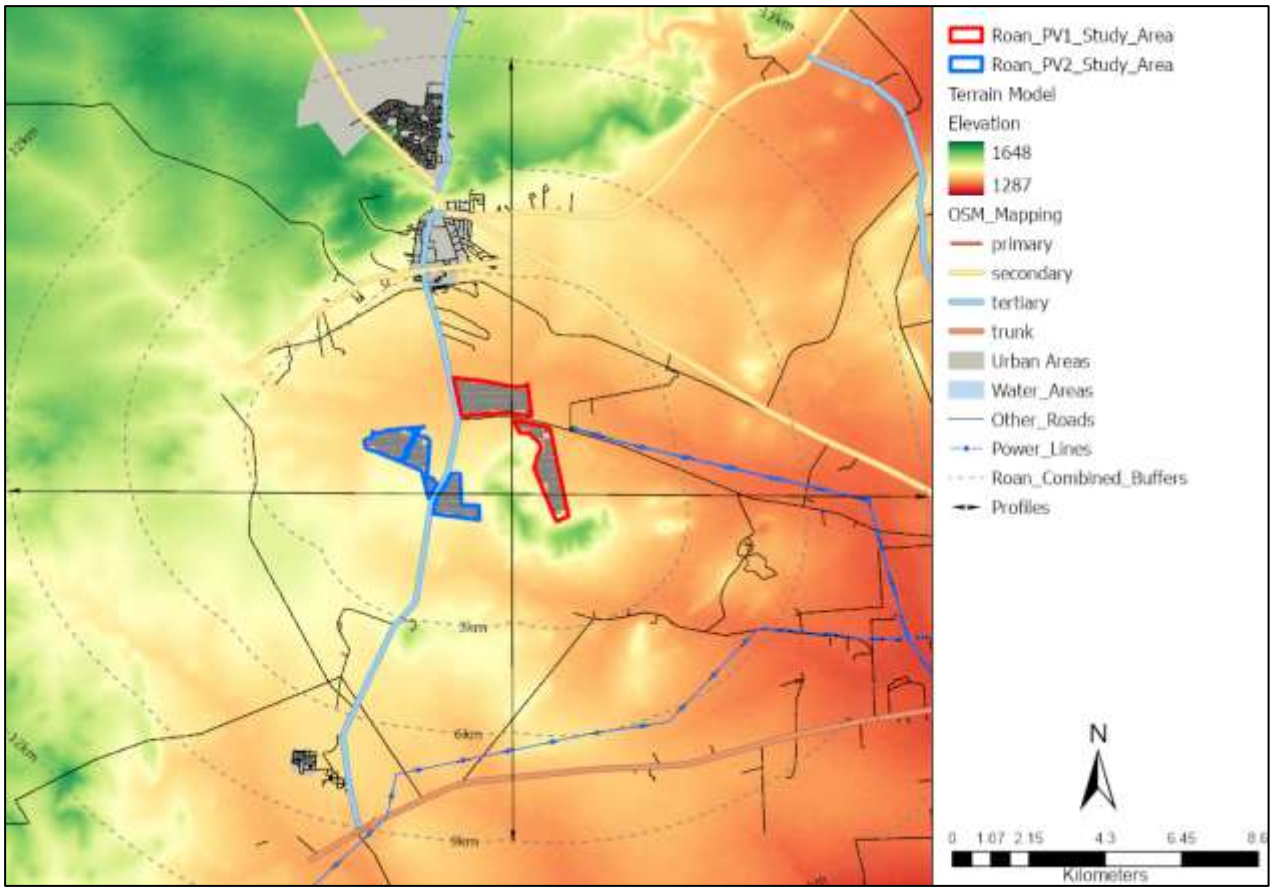

Figure 46: Regional Terrain Model and profile line locality map (Stead, 2022)

5.5 BOTANICAL COMPOSITION OF THE SITE

Anthene Ecological Cc undertook a Botanical Impact Assessment which formed part of larger Terrestrial Ecosystems Impact Assessment. Please refer to the Terrestrial Biodiversity Impact Assessment attached in **Annexure E1** from which the following has been drawn.

5.5.1 Broad-Scale Vegetation Patterns

Site is situated in the Klerksdorp Thornveld and the Vaal Vet Sandy Grassveld vegetation types as per the image below.

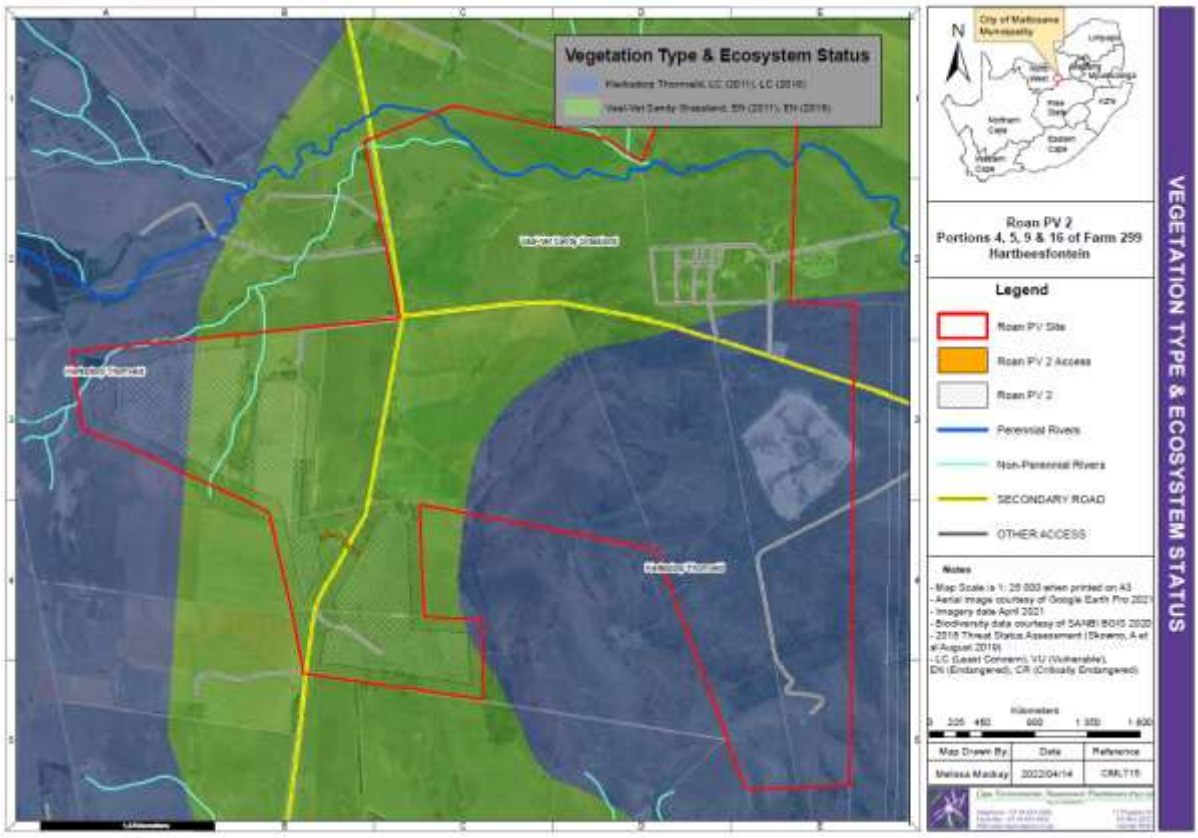

Figure 47: Broad Scale Vegetation Types Associated with Roan 2 PV.

5.5.1.1 Gh 10 Vaal-Vet Sandy Grassland

Distribution: In South Africa the Vaal-Vet Sandy Grassland is present in the North-West Province and Free State Province. Vaal-Vet Sandy Grassland ranges from south of Lichtenburgand Ventersdorp to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort areas north of Bloemfontein. Altitude ranges from 1 220 – 1560 m for the entire vegetation type (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains-dominated landscape with some scattered, slightly undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element are present. Dominance of Themeda triandra is an important feature of this vegetation unit. Locally low cover of Themeda triandra and the associated increase in Elionurus muticus, Cymbopogon pospischilii and Aristida congesta is attributed to heavy grazing and/or erratic rainfall. Geology and soils: Aeolian and colluvial sand overlying sandstone, mudstone, and shale of the Karoo Supergroup (mostly the Ecca group) as well as older Ventersdorp Supergroup and basement gneiss in the north (Mucina & Rutherford 2006).

Climate: Warm-temperate, summer-rainfall climate, with overall mean annual precipitation of 530 mm. High summer temperatures. Severe frost (37 days per year on average) occurs in winter (Mucina & Rutherford 2006).

Important taxa of the Vaal-Vet Sandy Grassland listed by Mucina & Rutherford (2006): Graminoids: Anthephora pubescens, Aristida congesta, Chloris virgata, Cymbopogon caesius, Cynodon dactylon, Digitaria argyrograpta, Elionurus muticus, Eragrostis chloromelas, Eragrostis lehmanniana, Eragrostis plana, Eragrostis trichophora, Heteropogon contortus, Panicum gilvum, Setaria sphacelata, Themeda triandra, Tragus berteronianus, Brachiaria serrata, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis curvula, Eragrostis obtusa, Eragrostis superba, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Stachys spathulata, Barleria

macrostegia, Berkheya onopordifolia var. onopordifolia, Chamaesyce inaequilatera, Geigeria aspera var. aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora, Vernonia oligocephala. Geophytic Herbs: Bulbine narcissifolia, Ledebouria marginata. Succulent Herb: Tripteris aghillana var. integrifolia. Low shrubs: Felicia muricata, Pentzia globosa, Anthospermum rigidum subsp. pumilum, Helichrysum dregeanum, Helichrysum paronychioides, Ziziphus zeyheriana.

5.5.1.2 Klerksdorp Thornveld (Gh 13)

Distribution: In South Africa the Klerksdorp Thornveld is present in the North West Province in two sets of patches, one in the Wolmaransstad, Ottosdal and Hartbeesfontein region, and the other from the Botsalano Game Park north of Mafikeng in the vicinity of Madibogo in the south. Altitude for the entire vegetation type is 1260 – 1580 m (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains or slightly irregular undulating plains with open to dense Acacia karroo bush clumps in dry grasslands (Mucina & Rutherford 2006). Geology and soils: Shale, slate and quartzite of the Pretoria Group with interlaid diabase sills and Hekpoort lava supporting relatively shallow and rocky soils (Glenrosa and Mispah forms). Equally represented are eutrophic red plinthic soils (Hutton form) derived mainly from a thick succession of volcanics and sediments of the Ventersdorp Supergroup (Mucina & Rutherford 2006).

Climate: Warm-temperate, summer-rainfall region, with overall mean annual precipitation of 533 mm. Summer temperatures are high. Frequent frosts occur in winter (Mucina & Rutherford 2006).

Important taxa of the Klerksdorp Thornveld listed by Mucina & Rutherford (2006): Small Trees: Acacia karroo, Acacia caffra, Celtis africana, Searsia lancea, Ziziphus mucronata. Tall Shrubs: Acacia hebeclada, Diospyros lycioides subsp. lycioides, Ehretia rigida, Grewia flava, Gymnosporia buxifolia, Searsia pyroides, Tarchonanthus camphoratus. Woody Climber: Asparagus africanus. Low Shrubs: Asparagus laricinus, Asparagus suaveolens, Felicia muricata, Anthospermum hispidulum, Anthospermum rigidum subsp. pumilum, Aptosimum elongatum, Gnidia capitata, Gomphocarpus fruticosus subsp. fruticosus, Helichrysum dregeanum, Leucas capensis, Pavonia burchellii, Pentzia globosa, Solanum supinum var. supinum, Triumfetta sonderi, Ziziphus zeyheriana. Graminoids: Aristida congesta, Cynodon dactylon, Eragrostis lehmanniana, Eragrostis trichophora, Microcloa caffra, Panicum coloratum, Sporobolus fimbriatus, Themeda triandra, Andropogon shirensis, Anthephora pubescens, Aristida junciformis subsp. galpinii, Aristida stipitata subsp. graciliflora, Brachiaria nigropedata, Brachiaria serrata, Bulbostylis burchellii, Cymbopogon pospischilii, Digitaria eriantha, Diheteropogon amplectens, Elionurus muticus, Eragrostis curvula, Eragrostis obtusa, Eragrostis racemosa, Eragrostis superba, Eustachys paspaloides, Heteropogon contortus, Setaria sphacelata, Sporobolus africanus, Tragus berteronianus, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Acalypha angustata, Acanthospermum australe, Berkheya onopordifolia var. onopordifolia, Berkheya setifera, Blepharis integrifolia var. clarkei, Chamaesyce inaequilatera, Chascanum adenostachyum, Dicoma macrocephala, Helichrysum nudifolium var. nudifolium, Hermannia lancifolia, Hibiscus pusillus, Justicia anagalloides, Lippia scaberrima, Nidorella microcephala, Nolletia ciliaris, Pollichia campestris, Rhyncosia adenodes, Salvia radula, Selago densiflora, Teucrium trifidum, Tolpis capensis. Geophytic Herbs: Bulbine narcissifolia, Ledebouria marginata, Ornithogalum tenuifolium subsp. tenuifolium, Raphionacme hirsuta. Herbaceous Climber: Rhynchosia venulosa.

5.5.2 Habitats & Plant Communities

The ecological specialist has found the following with regard to the Habitats and plant communities on site.

Table 15: Outline of main landscape and habitat characteristics of the site.

HABITAT FEATURE	DESCRIPTION
Topography	The area proposed for the development is on gentle (flat) to moderate slopes.
Rockiness	Rocky ridges are absent at most of the site. Rocky outcrops are present at the western part of the site.
Presence of wetlands	No wetlands appear to be present at the footprint propsosed for the development. A narrow non-perennial river, with its active channel and riparian zone, is present at the northwestern part of the site. An in-channel dam (Dam 1), is present at the northeastern part of the site. Another poorly defined active channel and riparian zone is present at the central part of the site. There is a very small dam (Dam 2) at this poorly defined active channel.
Vegetation	Vegetation at the site ranges from modified (cultivated fields) and ecologically degraded to patches of grassland in fair condition. The grass species Digitaria eriantha is conspicuous at the cultivated fields. Terrestrial vegetation at the site comprises grassland with a few trees. Cultivated fields planted for grazing as well as more natural grassland are present at the western and central part of the site. Savanna-like grassland is present at the eastern part of the site. Vegetation reminiscent of savanna at eastern part of the site. The indigenous tree species Vachellia karoo, Vachellia hebeclada and some individuals of Vachellia erioloba are present at the eastern savanna-like grassland at the site. Other indigenous tree species at this eastern part of the site include Grewia flava, Ziziphus mucronata and Searsia lancea. The shrub Asparagus laricinus and the climber Clematis brachiata are also visible in this area. Dwarf shrubs Felicia muricata and Ziziphus zeyheriana are also present. Indigenous grass species include Elionurus muticus, Eragrostis gummiflua, Aristida congesta, Cynodon dactylon, Eragrostis lehmanniana, Sporobolus fimbriatus, Sporobolus africanus, Themeda triandra, Aristida junciformis, Cymbopogon pospischilii, Digitaria eriantha, Heteropogon contortus, Setaria sphacelata, Sporobolus africanus and Eragrostis superba. Indigenous herbaceous plant species include Helichrysum nudifolium, Helichrysum rugulosum, Hilliardiella oligocephala, Lippia scaberrima, Teucrium trifidum, Chamaesyce inaequilatera, Barleria macrostegia and Pavonia burchellii. The geophytes Bulbine narcissifolia, Hypoxis hemerocallidea and Boophone disticha are present. Terrestrial grassland at central and western part of the site. The most conspicuous grass species at the cultivated grassland (for grazing) is Digitaria eriantha. More natural grassland with few trees and shrubs occurs at this central and western part of the site, as well. Trees and shrubs include Vachellia karroo, Searsia pyroides, Asparagus laricinus, Vachellia hebeclada and Seriphium plumosum. Grass species in the more natural but somewhat degraded grassland include Aristida congesta, Pogonarthria squarrosa, Cynodon dactylon, Eragrostis curvula, Eragrostis chloromelas, Eragrostis lehmanniana, Chloris virgata, Cymbopogon caesius, Eragrostis superba, Setaria sphacelata, Themeda triandra, Hyparrhenia hirta, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis gummiflua, Melinis repens and Urochloa mocambicensis. Dwarf shrubs Felicia muricata and Ziziphus zeyheriana are also found at this area. The karoo element Pentzia globosa occurs at hitherto cleared or eroded areas. Vegetation at the riparian zone and along the fringes of the in-channel dam (Dam 1) at the western part of the site include the trees Vachellia karroo and Searsia pyroides. Shrubs such as Asparagus laricinus and the herbaceous shrub Gomphocarpus fruticosus are conspicuous near and at the riparian zone. The indigenous herbaceous plant species Berkheya radula and the alien invasive Cirsium vulgare are found at the outer edges of the riparian zone. Sedge species such as Cyperus longus and Eleocharis limosa, with the grass species Echinochloa holubii and herbaceous Persicaria species are present at the more permanently inundated soils at the riparian zone. The alien invasive grass species Paspalum dilatatum as well as the alien invasive herbaceous

HABITAT FEATURE	DESCRIPTION
	species Oenothera rosea and Rumex crispus occur at the riparian zone and edges of the in-channel dam as well. The riparian vegetation along the poorly defined active channel at the central part of the site is also poorly defined in many areas. Few trees or shrubs are present at this riparian zone. This area appears to be trampled or eroded. The succulents Chasmatophyllum muscilinum and Ruschia canonotata are present at some of these bare areas with the karoo element Pentzia globosa. The sedge Kyllinga erecta is in particular conspicuous at wet areas along the riparian zone. The graminoids Echinochloa holubii, Eleocharis limosa and Kyllinga erecta are visible at the periphery of this small dam (Dam 2). A number of alien invasive weed species are present at disturbed areas across the site. These alien invasive weeds include Bidens bipinnata, Bidens pilosa, Argemone ochroleuca, Gomphrena celosioides, Schkuhria pinnata, Conyza bonariensis, Datura ferox, Richardia brasiliensis, Acanthospermum australe, Tagetes minuta, Guileminea densa and Alternanthera pungens..
Signs of disturbances	Large parts of the site consist of cultivated or hitherto cultivated fields. Ecological disturbances such as homesteads, fences, dirt roads and concrete dams, infrastructure typically associated with farming, are present at the site. A tar road runs through the site. Diggings, where water may occassionally gather during some rainfall events, are present at the site. Alien invasive weeds are conspicuous at disturbed areas, in particular at hitherto cleared places.
Connectivity	There is little scope for most of the site to be part of a corridor of particular conservation importance, excluding the watercourses (with their bufferzones) and the area where rocky outcrops are present. The non-perennial rivers at the site, as well as the rocky outcrops at the western part of the site are considered to be biodiversity corridors of particular conservation importance.

Figure 48: Cultivated fields, where a grazing grass species Digitaria eriantha is conspicuous at the central-western part of the site (Terblanche, 2022)

Figure 49: In-channel dam (Dam 1) at the northwestern part of the site. Areas in the background are outside the site. (Terblanche, 2022)

Figure 50: Small in-channel dam (Dam 2) at the central part of the site (Terblanche, 2022)

Figure 51: View of the eastern part of the site. The hill in the background is not part of the area considered for the footprint. (Terblanche, 2022)

Figure 52: View towards the southern fence of the eastern part of the site where clumps of alien invasive Eucalyptus trees are present (Terblanche, 2022)

5.5.3 Species of conservation concern.

The Ecological Specialist identified the following with regards to plant species of conservation concern in the greater area and whether or not they are likely to be resident at the site (No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.).

As can be seen in the tables below, two plant species, which are not threatened but listed as Declining occur at the site: Boophone disticha and Hypoxis hemerocallidea (Star Flower). A search and rescue operation should apply for these plant species. These plant species can be translocated to a suitable area nearby or at the site by a qualified specialist.

Table 16: Threatened plant species of the North West Province which are listed in the Critically Endangered category.

Species	Status:	Resident at the site
Brachystelma canum	Critically Endangered	No
Brachystelma gracillimum	Critically Endangered	No

Table 17: Threatened plant species of the North West Province which are listed in the Endangered category.

Species	Status:	Resident at the site
Aloe peglerae	Endangered	No
Brachystelma discoideum	Endangered	No

Table 18: Threatened plant species of the North West Province which are listed in the Vulnerable category.

Species	Status: Global status or national status indicated	Resident at the site
Brachycorythis conica subsp. *transvaalensis*	Vulnerable	No
Brachystelma incanum	Vulnerable	No
Ceropegia decidua subsp. *pretoriensis*	Vulnerable	No
Ceropegia stentiae	Vulnerable	No
Ledebouria atrobrunnea	Vulnerable	No
Marsilea farinosa	Vulnerable	No
Melolobium subspicatum	Vulnerable	No
Prunus africana	Vulnerable	No
Rennera stellata	Vulnerable	No
Searsia maricoan	Vulnerable	No

Table 19: Near Threatened plant species of the North West Province.

Species	Status:	Resident at the site
Adromischus umbraticola subsp. *umbraticola*	Near Threatened	No
Ceropegia turricula	Near Threatened	No
Cineraria austrotransvaalensis	Near Threatened	No
Cleome conrathii	Near Threatened	No
Delosperma leendertziae	Near Threatened	No
Drimia sanguinea	Near Threatened	No
Elaeodendron transvaalense	Near Threatened	No
Kniphofia typhoides	Near Threatened	No
Lithops leslei subsp. *leslei*	Near Threatened	No
Nerine gracilis	Near Threatened	No
Sporobolus oxyphyllus	Near Threatened	No
Stenostelma umbelluliferum	Near Threatened	No

Table 20: Plant species of the North West Province which are not threatened and not near threatened but which are of particular conservation concern and listed in the **Critically Rare** category.

Species	Conservation status	Resident at the site
Gladiolus filiformis	Critically Rare	No

Table 21: Plant species of the North West Province which are not threatened and not near threatened but of which are of particular conservation concern and listed in the **Rare** category

Species	Status:	Resident at the site
Brachystelma dimorphum susbp. *gratum*	Rare	No
Ceropegia insignis	Rare	No
Frithia pulchra	Rare	No
Gnaphalium nelsonii	Rare	No
Habenaria culveri	Rare	No

Table 22: Plant species of the North West Province which are not threatened and not near threatened but which are of particular conservation concern and listed in the **Declining** category (

Species	Status:	Resident at the site
Boophone disticha	Declining	Yes
Crinum bulbispermum	Declining	No
Crinum macowanii	Declining	No
Drimia altissima	Declining	No
Eucomis autumnalis	Declining	No
Gunnera perpensa	Declining	No
Hypoxis hemerocallidea	Declining	Yes
Ilex mitis	Declining	No
Pelargonium sidoides	Declining	No

Table 23: Tree species of the North West Province which are listed as **Protected Species** under the National Forests Act No. 84 of 1998, Section 15(1)**.**

Species	Conservation status	Resident at the site
Boscia albitrunca (Sheppard's tree)	Protected	No
Combretum imberbe (Leadwood)	Protected	No
Sclerocarya birrea (Marula)	Protected	No
Securidaca longepedunculata (Violet Tree)	Protected	No
Vachellia erioloba (Camel Thorn Tree)	Protected	Yes

5.6 TERRESTRIAL FAUNAL COMPONENT OF THE SITE

Anthene Ecological Cc undertook an Animal Species Assessment which formed part of larger Terrestrial Ecosystems Impact Assessment. Please refer to the Terrestrial Ecological Impact Assessment attached in **Annexure E1** from which the following has been drawn.

5.6.1 Mammals

The tables below lists the possible presence or absence of threatened mammal species, near threatened mammal species and mammal species of which the status is uncertain, respectively, at the site. Literature sources that were used are Friedman & Daly (2004), Skinner & Chimimba (2005) and Wilson & Reeder (2005). Since the site falls outside reserves, threatened species such as the black rhinoceros (Diceros bicornis) and the African wild dog (Lycaon pictus) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

5.6.2 Reptiles

The tables below list the possible presence or absence of Threatened and Near Threatened reptile species on the site. Main Source used for the conservation status and identification of reptiles are Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Alexander & Marais (2007) as well as Tolley & Burger 2007) give useful indications of distributions, habitats and identification of the reptile species. There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

5.6.3 Amphibians

No frog species that occur in the North West are listed as Threatened species (Vulnerable, Endangered or Critically Endangered) or Near Threatened species according to IUCN Amphibian Specialist Group

(2013). Pyxicephalus adspersus (Giant Bullfrog) is listed as Least Concern globally. Suitable habitat for Giant Bullfrog at site appears to be absent.

5.6.4 Butterflies

Studies about the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Four species of butterfly in Gauteng Province and North West Province combined are listed as threatened in the recent butterfly conservation assessment of South Africa (Mecenero et al., 2013). The expected presence or not of these threatened butterfly species as well as species of high conservation priority that are not threatened, at the site (

5.6.5 Fruit chafer beetles

The table below lists the fruit chafer beetle species (Coleoptera: Scarabaeidae: Cetoninae) that are of known high conservation priority in the North West Province. No Ichnestoma stobbiai or Trichocephala brincki were found during the surveys. There appears to be no suitable habitat for Ichnestoma stobbiai or Trichocephala brincki at the site. There appears to be no threat to any of the fruit chafer beetles of particular high conservation priority if the site were developed.

5.6.6 Scorpions

The table below lists the rock scorpion species (Scorpiones: Ischnuridae) that are of known high conservation priority in the North West Province. None of these rock scorpions have been found at the site and the habitat does not appear to be optimal.

5.7 SPECIES OF CONSERVATION CONCERN

The tables below outline the terrestrial fauna of conservation concern that may occur in the area as well as well as whether they are likely to be found at the site (No = Not recorded at site/ Unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site)

Table 24: Threatened mammal species of the North West Province.

Species	Threatened Status	Recorded at site during survey	Likely to be found based on habitat assessment
Chrysospalax villosus Rough-haired golden mole	Vulnerable	No	No
Cloeotis percivali Short-eared Trident Bat	Vulnerable/ Near-threatened	No	No
Diceros bicornis Black rhinoceros	Critically Endangered	No	No
Lycaon pictus African wild dog	Endangered	No	No
Loxodonta africana African elephant	Vulnerable	No	No
Mystromys albicaudatus White-tailed mouse	Endangered	No	No
Neamblysomus julianae Juliana's Golden Mole	Critically Endangered	No	No
Panthera leo Lion	Vulnerable	No	No

Species	Threatened Status	Recorded at site during survey	Likely to be found based on habitat assessment
Rhinolophus blasii Blasi's Horseshoe Bat	Vulnerable	No	No
Smutsia temminckii Ground Pangolin	Vulnerable	No	No

Table 25: Near Threatened mammal species known to occur in the North West Province.

Species	Threatened Status	Recorded at site during survey	Likely to be found based on habitat assessment
Ceratotherium simum White Rhinoceros	Near threatened	No	No

Table 26: Data deficient (or uncertain) mammal species of the North West Province.

Species	Threatened Status	Recorded at site during survey	Likely be a resident at the site
Myosorex varius Forest shrew	Uncertain	No	No

Table 27: Threatened reptile species in North West Province.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Crocodylus niloticus Nile Crocodile	Vulnerable	No	No	No

Table 28: Near threatened reptile species in North West Province.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Homoroselaps dorsalis Striped Harlequin Snake	Near threatened	No	No	No

Table 29: Near threatened amphibian species in North West Province.

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Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Pyxicephalus adspersus Giant Bullfrog	Least Concern (IUCN) Remains a species of particular conservation concern.	No	No	No

Table 30: Threatened butterfly species in North West Province and Gauteng Province.

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
Aloeides dentatis dentatis Roodepoort Toothed Russet	Endangered	No	Highly unlikely
Chrysoritis aureus Golden Opal/ Heidelberg Copper	Endangered	No	Highly unlikely
Lepidochrysops praeterita Highveld Giant Cupid/ Highveld Blue	Endangered	No	Highly unlikely
Orachrysops mijburghi Heilbron Cupid	Endangered	No	Highly unlikely

Table 31: Butterfly species of the North West Province and Gauteng Province that are Near Threatened

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
Metisella meninx Marsh Sylph	Near Threatened	No	Possibly but riparian zone at site not ideal habitat; could use riparian zone as corridor

Table 32: Fruit chafer species (Coleoptera: Scarabaeidae: Cetoninae) in the Gauteng Province and North-West Province which are of known high conservation priority.

Species	Threatened Status	Recorded at site during survey	Likely to be resident based on habitat assessment
Ichnestoma stobbiai	Uncertain	No	No
Trichocephala brincki	Uncertain	No	No

Table 33: Rock scorpion species (Scorpiones: Ischnuridae) species that are of known high conservation priority in the Gauteng Province and North-West Province.

Species	Threatened Status	Recorded at site during survey	Likely to be resident at site based on habitat assessment
Hadogenes gracilis	Uncertain	No	No
Hadogenes gunningi	Uncertain	No	No

5.8 AVIFAUNAL COMPONENT OF THE STUDY SITE

Mr Chris van Rooye undertook an Avifaunal Assessment for the proposed Roan 2 PV. Please refer to the Avifaunal Impact Assessment attached in **Annexure E3** from which the following general descriptions of the avifauna on site has been drawn.

A total of 268 species could potentially occur within the broader where the project is located. Of these, 97 are classified as priority species. Of the 97 priority species, 38 have a medium to high probability of occurring in the development area. Of the 38 priority species with a medium to high probability of occurrence, 14 were recorded during site surveys.

All the species of conservation concern (SSC) recorded in the broader area by SABAP2 (Lanner Falcon, Secretarybird, Verreaux's Eagle), except one (Yellow-billed Stork), have a full protocol reporting rates of less than 1%, indicating vagrant status in the area. Yellow-billed Stork has a reporting rate of 1.74%, which is also very low.

No Species of Conservation Concern were recorded at the Roan 2 development area during surveys .

5.8.1 Important Bird Areas (IBAs)

The Barberspan and Leeupan IBA SA026 is the closest IBA and is located approximately 86km north-west of the site. The proposed development is not expected to have any impact on the avifauna in this IBA due to the distance from the development.

5.8.2 Bird Habitat

The study area is located in the Grassland Biome, in the Dry Highveld Grassland Bioregion and is situated in area that is made up of a mixture of grassland and thorny woodland. The habitat is quite variable and consists of fallow fields (recovering grassland), natural grassland, shrub- and woodland, some wetland and pans, and some agricultural and industrial activities. Mucina & Rutherford (2006) classifies the area as mixture between Vaal-Vet Sandy Grassland and Klerksdorp Thornveld.

There is a riparian zone, the Jagspruit River and its floodplain and wetlands, in the north of the study area. The is also a scattering of artificial wetlands, pans, and round cement dams. The eastern half of the study area.

The following distinct habitat features are present in or in the immediate vicinity of the development area:

- Grassland
- Woodland
- Rivers and Wetlands
- Pans and Dams
- Agriculture
- Industrial

5.8.2.1 Grassland

SABAP1 recognises six primary vegetation divisions within South Africa, namely (1) Fynbos (2) Succulent Karoo (3) Nama Karoo (4) Grassland (5) Savanna and (6) Forest (Harrison et al. 1997). The criteria used by the authors to amalgamate botanically defined vegetation units, or to keep them separate were (1) the existence of clear differences in vegetation structure, likely to be relevant to birds, and (2) the results of published community studies on bird/vegetation associations. It is important to note that no new vegetation unit boundaries were created, with use being made only of previously published data (Harrison et al. 1997).

Grassland is dominated by grasses, with geophytes and herbs also well represented. Grasslands are maintained by a combination of relatively high summer rainfall, frequent fires, frost, and grazing, which prevent the presence of shrubs and trees (Harrison et al. 1997).

The following priority species with a medium to high likelihood of occurrence could potentially use the grassland in the development area:

- African Sacred Ibis
- Amur Falcon
- Black-headed Heron
- Blacksmith Lapwing

- Black-winged Kite
- Cloud Cisticola
- Common Buzzard
- Lesser Kestrel
- Pied Starling
- South African Cliff Swallow
- Western Barn Owl
- Western Cattle Egret

5.8.2.2 Woodland

The dominant habitat in the development area is mainly woodland and thornveld. Woodlands can be important nesting areas for avian species. The woodland areas consist of mainly fine-leaved, semi-deciduous Vachellia-dominated habitat.

The following priority species with a medium to high likelihood of occurrence could potentially use the woodland in the development area:

- Black-winged Kite
- Common Buzzard
- Fiscal Flycatcher
- Karoo Thrush
- Western Barn Owl

5.8.2.3 Rivers and wetlands

Rivers and wetlands are important habitats, especially for priority species. There are a number of wetlands scattered across the study area. These provide habitat for waterfowl, waders and reedbed dwellers such as rails and crakes. There is riparian zone, the Jagspruit River, and its floodplain and wetlands, bordering on the development area in the north.

The following priority species with a medium to high likelihood of occurrence could potentially use the riverine habitat and wetlands in close proximity the development area:

- Fiscal Flycatcher
- Glossy Ibis
- Great Crested Grebe
- Grey Heron
- Kittlitz's Plover
- Little Egret
- Little Grebe
- Little Stint
- Marsh Sandpiper
- Red-billed Teal
- Red-knobbed Coot
- Reed Cormorant
- Ruff
- South African Cliff Swallow
- South African Shelduck
- Southern Pochard
- Spur-winged Goose
- Three-banded Plover
- Western Cattle Egret
- Whiskered Tern
- White-breasted Cormorant

- White-faced Whistling Duck
- Wood Sandpiper
- Yellow-billed Duck

5.8.2.4 Pans, dams and water reservoirs

Surface water is of importance to avifauna in this semi-arid area. The study area contains a few small seasonal pans and some artificial impoundments (ground dams and water reservoirs) which provide habitat for waterbirds. Some of these are located in (water reservoirs) or near (pans) the development area.

The following priority species with a high or medium likelihood of occurrence could use pans and dams in the development area:

- African Sacred Ibis
- African Spoonbill
- Red-knobbed Coot
- Blacksmith Lapwing
- Black-winged Stilt
- Cape Shoveler
- Cape Teal
- Egyptian Goose
- Grey Heron
- Little Grebe
- Common Buzzard
- Kittlitz's Plover
- Little Stint
- Marsh Sandpiper
- Red-billed Teal
- Reed Cormorant
- South African Shelduck
- Southern Pochard
- Spur-winged Goose
- Three-banded Plover
- Whiskered Tern
- White-breasted Cormorant
- White-faced Whistling Duck
- Wood Sandpiper
- Yellow-billed Duck

5.8.2.5 Agriculture

There is some agricultural activity within the development area. The fields are mainly used for grazing. Certain bird species have adapted to, and some even thrive, in agricultural habitats.

The following species with a high or medium likelihood of occurrence could use agricultural lands in the development area:

- African Sacred Ibis
- Amur Falcon
- Blacksmith Lapwing
- Egyptian Goose
- Black-winged Kite
- Common Buzzard
- Lesser Kestrel

- Pied Starling
- Spur-winged Goose
- Western Cattle Egret
- Western Barn Owl

5.8.2.6 Industrial

There are some industrial developments and heavily transformed habitats bordering the development area. Remnants of old mining quarries, extraction pits and stockpiles are present in the study area as well as an electrical substation. There are also some areas with alien trees and residential homes.

The following priority species with a high or medium likelihood of occurrence could use industrial habitat (including alien trees) on occasion:

- Amur Falcon
- Black-headed Heron
- Black-winged Kite
- Common Buzzard
- Fiscal Flycatcher
- Lesser Kestrel
- Karoo Thrush
- Western Barn Owl

5.9 AQUATIC COMPOSITION OF THE STUDY SITE

Anthene Ecological Cc undertook an Aquatic Ecosystems Assessment. Please refer to the Aquatic Ecosystems Impact Assessment attached in **Annexure E2** from which the following has been drawn.

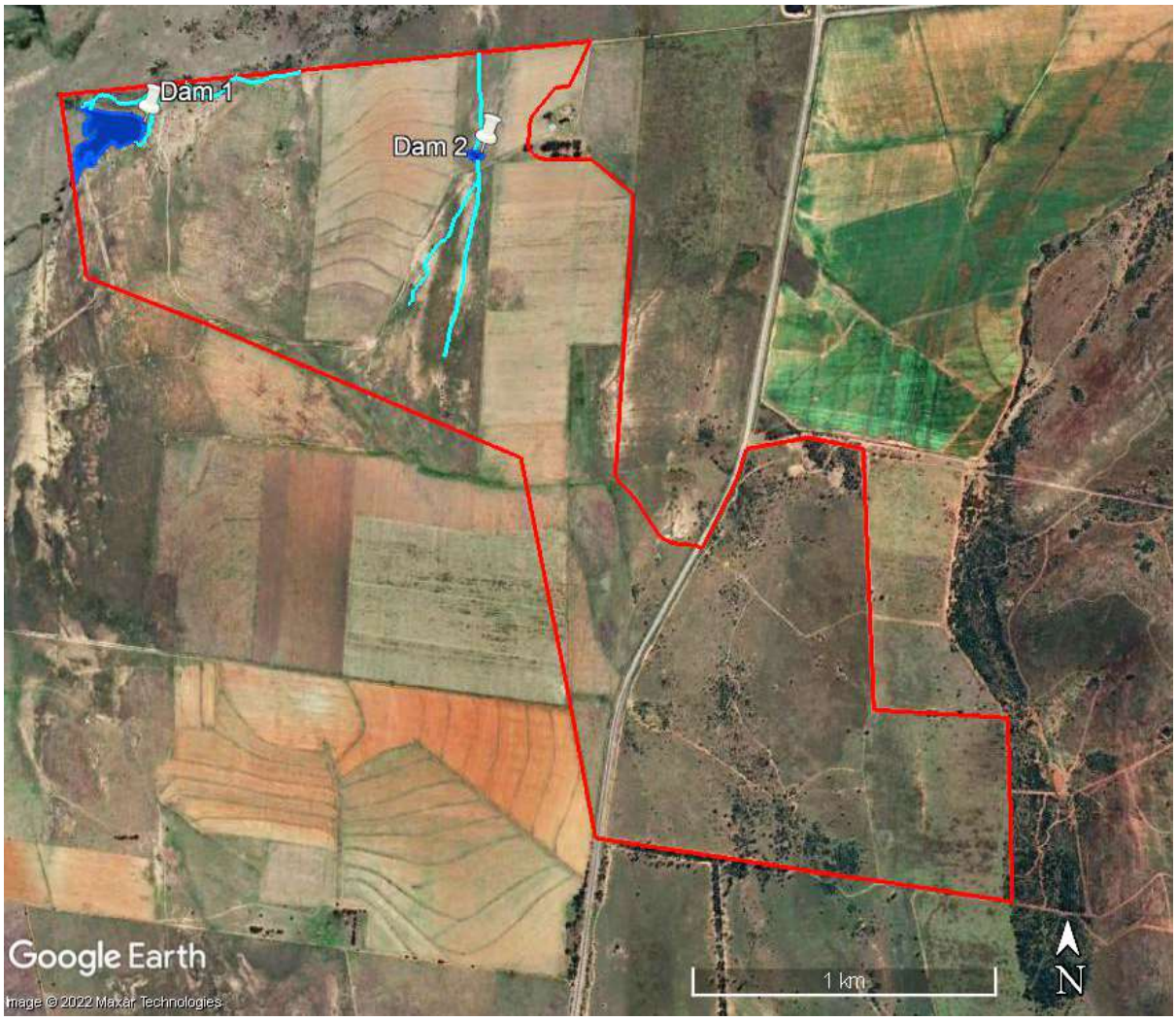

Figure 53: Location of non-perennial rivers and in channel dams within the study site (Terblanche, 2022)

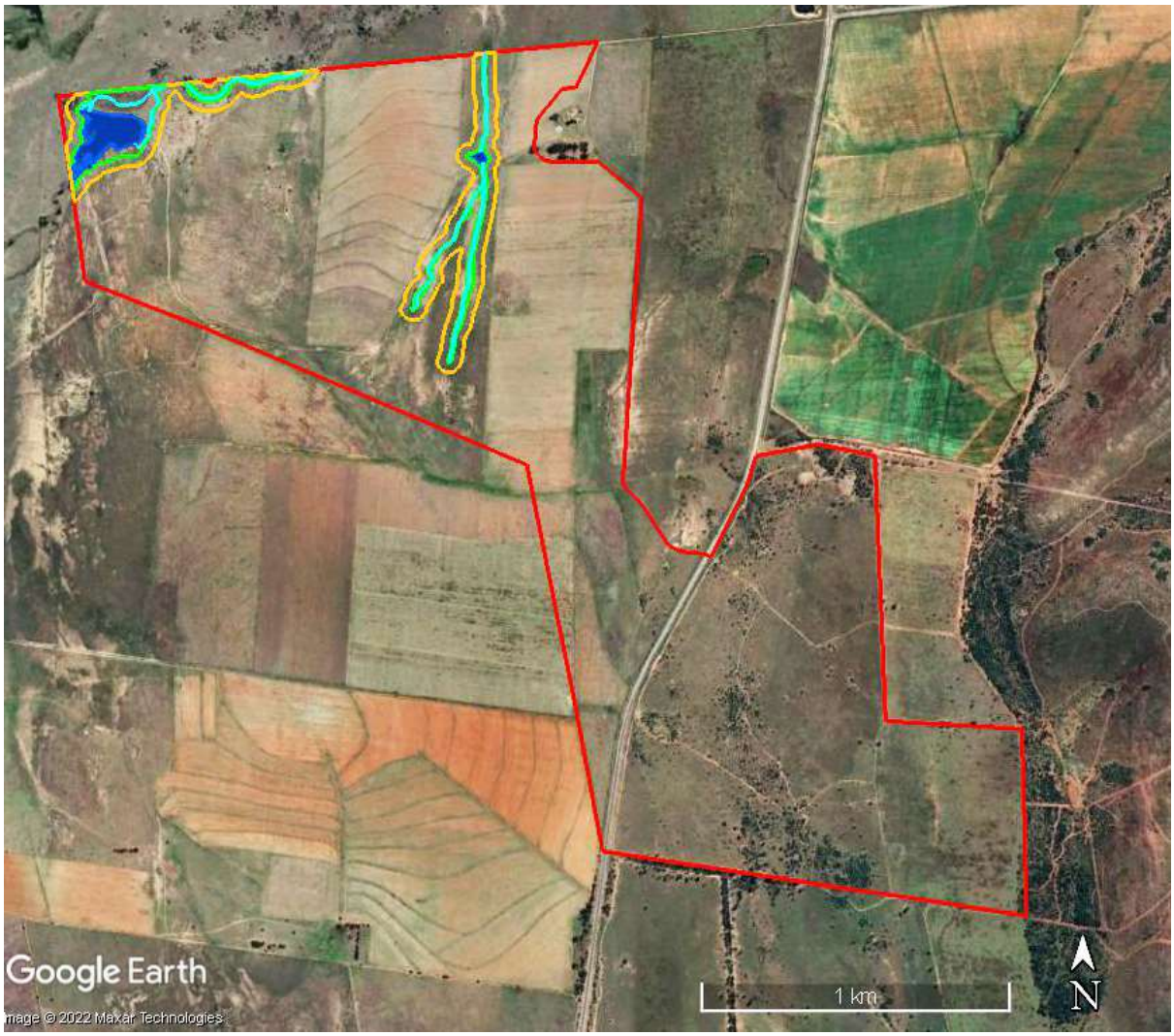

Figure 54: Location of non-perennial rivers and In channel Dams, with their buffer zones (30 m), at the site. (Terblanche, 2022)

Wetlands that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at site.

A narrow non-perennial river, with its active channel and riparian zone, is present at the northwestern part of the site. An in-channel dam (Dam 1), is present at the northeastern part of the site. Another poorly defined active channel and riparian zone are present at the central part of the site. There is a very small dam (Dam 2) at this poorly defined active channel.

Riparian zones have distinctive characteristic vegetation which is often visibly distinct from the surrounding vegetation. It is often clearly adapted to different levels of frequency and inundation and distributed accordingly within the broad riparian zone. The more water loving or mesic species are therefore located close to the river channel, while species which are less dependent on water are located further away. It is the ability of species to tolerate different levels of inundation, the need for excessive water availability, or the need for close river proximity for growth, propagation, temperature control and nutrient enrichment which clearly determinate the structural, compositional and functional characteristics of riparian zones.

Vegetation at the riparian zone and along the fringes of the in-channel dam (Dam 1) at the western part of the site includes the trees Vachellia karroo and Searsia pyroides. Shrubs such as Asparagus laricinus and the herbaceous shrub Gomphocarpus fruticosus are conspicuous near and at the riparian zone.

The indigenous herbaceous plant species Berkheya radula and the alien invasive Cirsium vulgare are found at the outer edges of the riparian zone. Sedge species such as Cyperus longus and Eleocharis limosa, with the grass species Echinochloa holubii and herbaceous Persicaria species are present at the more permanently inundated soils at the riparian zone. The alien invasive grass species Paspalum dilatatum as well as the alien invasive herbaceous species Oenothera rosea and Rumex crispus occur at the riparian zone and edges of the in-channel dam as well.

The riparian vegetation along the poorly defined active channel at the central part of the site is also poorly defined in many areas. Few trees or shrubs are present at this riparian zone. This area appears to be trampled or eroded. The succulents Chasmatophyllum muscilinum and Ruschia canonotata are present at some of these bare areas with the karoo element Pentzia globosa. The sedge Kyllinga erecta is in particular conspicuous at wet areas along the riparian zone. The graminoids Echinochloa holubii, Eleocharis limosa and Kyllinga erecta are visible at the periphery of this small dam (Dam 2).

Present ecological status (PES) of the Non-perennial River (with Dam 1) at the site is CATEGORY C which means the watercourse is moderately modified but with some loss of natural habitats. Ecological Importance and Sensitivity (EIS) of the non-perennial river (with Dam 1) at the site is Category C which is Moderate and refers to watercourses that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.

Present ecological status (PES) of the Non-perennial River (with Dam 2) at the site is CATEGORY C which means the watercourse is moderately modified but with some loss of natural habitats. Ecological Importance and Sensitivity (EIS) of the non-perennial river (with Dam 2) at the site is Category C which is Moderate and refers to watercourses that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.

It must be noted that the preferred layout (Layout Alternative 1) has been specifically developed to exclude these two non-perrennial rivers, the in stream dams and the associated buffers identified by the Aquatic Specialist

5.10 SOCIO ECONOMIC CONTEXT

This section is summarised from the Social Impact Assessment undertaken by Savannah Environmental (Appendix E8) and provides an overview of the spatial context of the Province, District Municipality, and Local Municipality within which Roan 2 PV is proposed, and furthermore provides the socio-economic basis against which potential social issues have been identified and assessed.

Table 34: Spatial Context of the study area for the development of the Roan 2 PV Facility and associated infrastructure

Province	North West Province
District Municipality	Dr Kenneth Kaunda District Municipality
Local Municipality	City of Matlosana Local Municipality
Ward number(s)	1 & 18
Nearest town(s)	Hartbeesfontein (approximately 5km north of the proposed site)

5.10.1 North West Province

The North West Province is situated in the central-northern extent of South Africa. The Province is bordered by Northern Cape Province to the west, and south-west; Free State Province to the south; Gauteng Province to the east; Limpopo Province to the north-east; and Botswana to the north. It occupies an area of land approximately 104 882km² in extent, making it South Africa's 6th largest in

terms of area; and has a population of 3 509 953 (2011) and population density of 33/km² (2011), making it South Africa's 7th most densely populated Province.

The North West Province is characterised by altitudes ranging from 920 - 1782m amsl, which makes it one of the provinces with the most uniform terrain. The central and western extents of the Province are characterised by gently undulating plains, while the eastern extent is characterised as mountainous, and includes the Magaliesberg mountain range. Ancient igneous rock formations dominate the north-eastern and north-central extent of the Province; and the Gatsrand between Potchefstroom and Carletonville is considered to be one of the most ancient preserved landscapes in the world. The geology of the Province is significant given its mineral resources which are rich in platinum, gold, uranium, iron, chrome, manganese and diamonds.

In terms of land use patterns, approximately 69% of the North West Province is in a natural, or near-natural state; while 31% of the province is irreversibly modified as a result of croplands (25.6%), urban (3.5%), and mining (0.7%) activities. The Province is predominantly rural with the main economic activities comprising mining and agriculture. The North West Province comprises 4 Districts, namely Bojanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompati, and Dr Kenneth Kaunda.

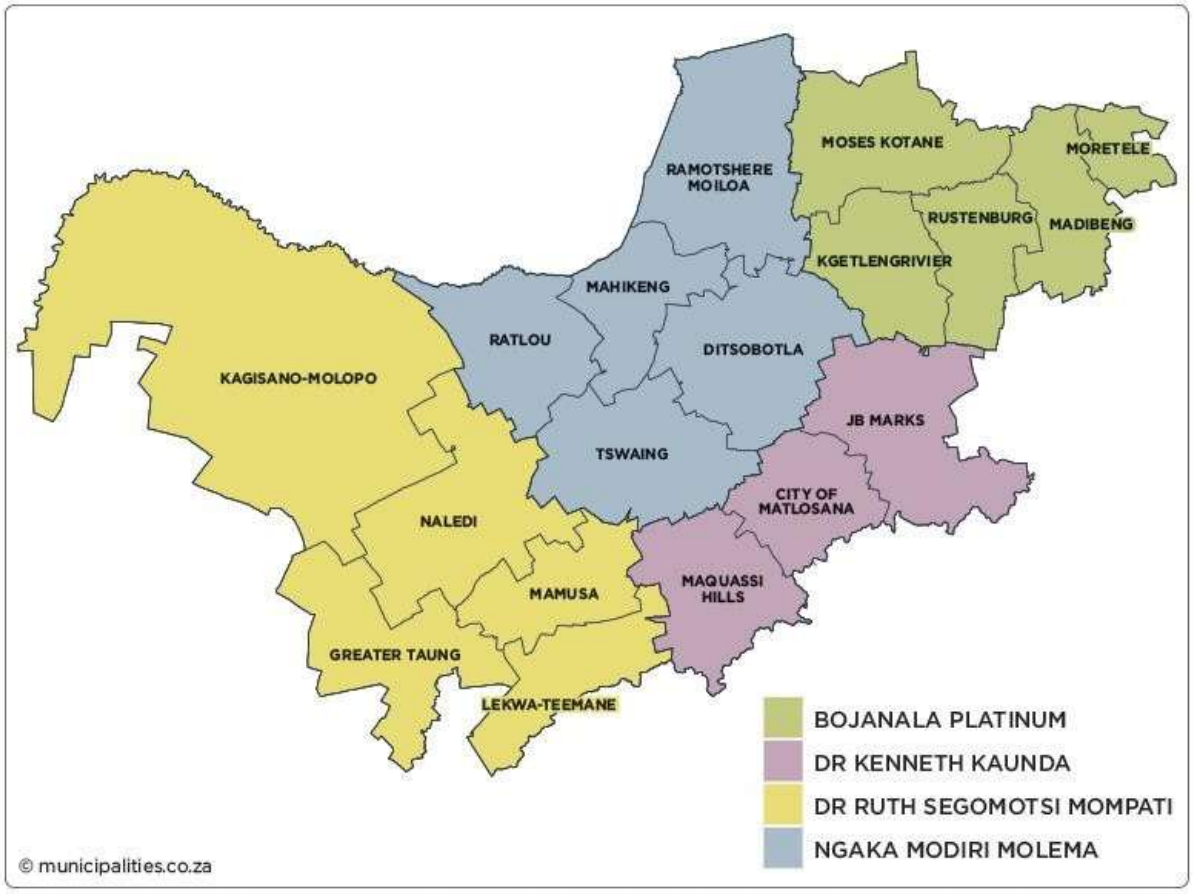

Figure 55: Districts and local municipalities within the North West Province (Savannah, 2022)

5.10.2 Dr Kenneth Kaunda DM

The Dr Kenneth Kaunda District Municipality (DKKDM) is situated at the southern part of the North West Province and borders both the Gauteng (located 65km south-west of Johannesburg) and the Free State Province (Refer to **Error! Reference source not found.**). The DKKDM is the smallest of the four districts and is made up of five local municipalities namely, Ventersdorp, Tlokwe, City of Matlosana, Lekwa Teename and Maquassi Hills.

Mining is the dominant economic activity of the district, Additional sectors in terms of employment are social services, trade and farming. Potchefstroom is home to several tertiary institutions and training centres while the economic base for Ventersdorp is agriculture. The main economic sectors in the DKKDM include mining, trade, finance, business services, manufacturing, construction, government services and agriculture.

The district is serviced by several primary roads, with the N12 Treasure Corridor forming the main development axis in the district and serving as a potential concentration point for future industrial, commercial and tourism development. DKKDM is a region with a rich and diverse natural and cultural heritage, with the potential for sustained economic growth. The major cities/towns in the District municipality include, Hartbeesfontein, Klerksdorp, Leeudoringstad, Makwassie, Orkney, Potchefstroom, Stilfontein, Ventersdorp, Witpoort and Wolmaransstad.

5.10.3 City of Matlosana Local Municipality

The City of Matlosana Local Municipality (CMLM) is located in the DKKDM in the North West Province It is one four local municipalities in this district, The major towns are Hartbeesfontein, Klerksdorp, Orkney and Stilfontein (Local government handbook, 2021). The CMLM is also located 120km south of Rustenburg and the platinum belt. Klerksdorp, Jouberton, Alabama, Manzilpark, Orkney, Kanana, Vaal Reefs, Stilfontein, Khuma, Tigane and Hartebeesfontein area all areas that form part of the CMLM. The following characteristiecs are found within the CMLM (South African Cities Network, 2012):

- Klerksdorp was originally established and developed as a regional service centre between the gold mining areas on the Rand and the diamond mining fields in the Cape in the late 1800s. The paper makes the specific point that this historical role as regional/rural service centre has helped to mitigate the impact of mine downscaling since the early 1990s. Although Klerksdorp has always been the main economic hub of the greater municipal area, it has not specifically been involved in the mining activities but has maintained the function of a regional service centre in terms of agricultural supplies, retail facilities, schools and medical services which stretches further than the boundaries of the Dr Kenneth Kaunda District Municipality into the North West Province and even Botswana. It is precisely this notion which has helped sustain the area in a period of considerable mining decline over the last 20 years.
- Since the early 1990s but more specifically since 2001, mining activities have downscaled drastically. This downscaling also lead to nearly 75% of the original workforce in 1996 being retrenched by 2011. It seems as if significant percentages of these retrenchment packages have been reinvested in the area because the housing market has improved despite the decrease in employment. Entrepreneurial activities have also intensified due to compulsory self-employment advancements. The City of Matlosana case study can therefore be strongly linked to the research that has been completed in terms of mining downscaling and closures.
- The declining mining industry has resulted in the number of people living in poverty in the City of Matlosana almost doubling between 1996 and 2011. This is due to the fact that the municipal area is characterised by high unemployment levels (19.6%) – albeit the fact that this percentage is somewhat lower than the national average.
- Although the economic decline of the area is similar to that experienced in the Free State Goldfields the overall impact in Matlosana seems significantly less than in the Free State Goldfields. The rapid economic decline of the area has been buffered by (1) the regional service character of the area (2) a business focus which has expanded into Botswana (3) proximity to platinum belt (4) proximity to Gauteng (in fact some researchers view the areas as a spatial extension of Gauteng) and more specifically, proximity to the West Rand.
- Currently, the N12 Treasure Route puts Klerksdorp in the centre of new developments. Towards the west of the N12, developments comprise residential development, retail nodes and mixed

land usages. This is where the new Rio Casino Resort and shell garage (future truck inn) was developed as well as a Tower Mall retail centre to open at the end of 2013. The east of this corridor is earmarked for bulk services, with projects like a regional shopping complex, integrated housing, IT Call Centre, and light industry (medical and mining supplies show potential). This development has also affected the decentralisation of business into the northern suburbs of Klerksdorp and business activities along the N12. These activities probably have two main implications. In the first place the emphasis on new trade space probably confirms the regional service role of the town. In fact the distance of influence has probably increased over the past 20 years. Secondly, the corridor development suggests the importance of the link with Gauteng.

- Like many other cities and towns in South Africa, old infrastructure is a matter of concern. The old infrastructure systems are already in need of drastic upgrades and continuous maintenance – this pressure will only increase, resulting in various challenges. At the same time the historic role related to mining has created significant problems for municipal management in the advent of mine downscaling and closure. One such an example is the inability of the municipality to institute an appropriate billing system.
- The notion of becoming a metropolitan area is high on the agenda of The City of Matlosana. The conceptual idea is to link up with Tlokwe and form a metro on the N12 corridor development.

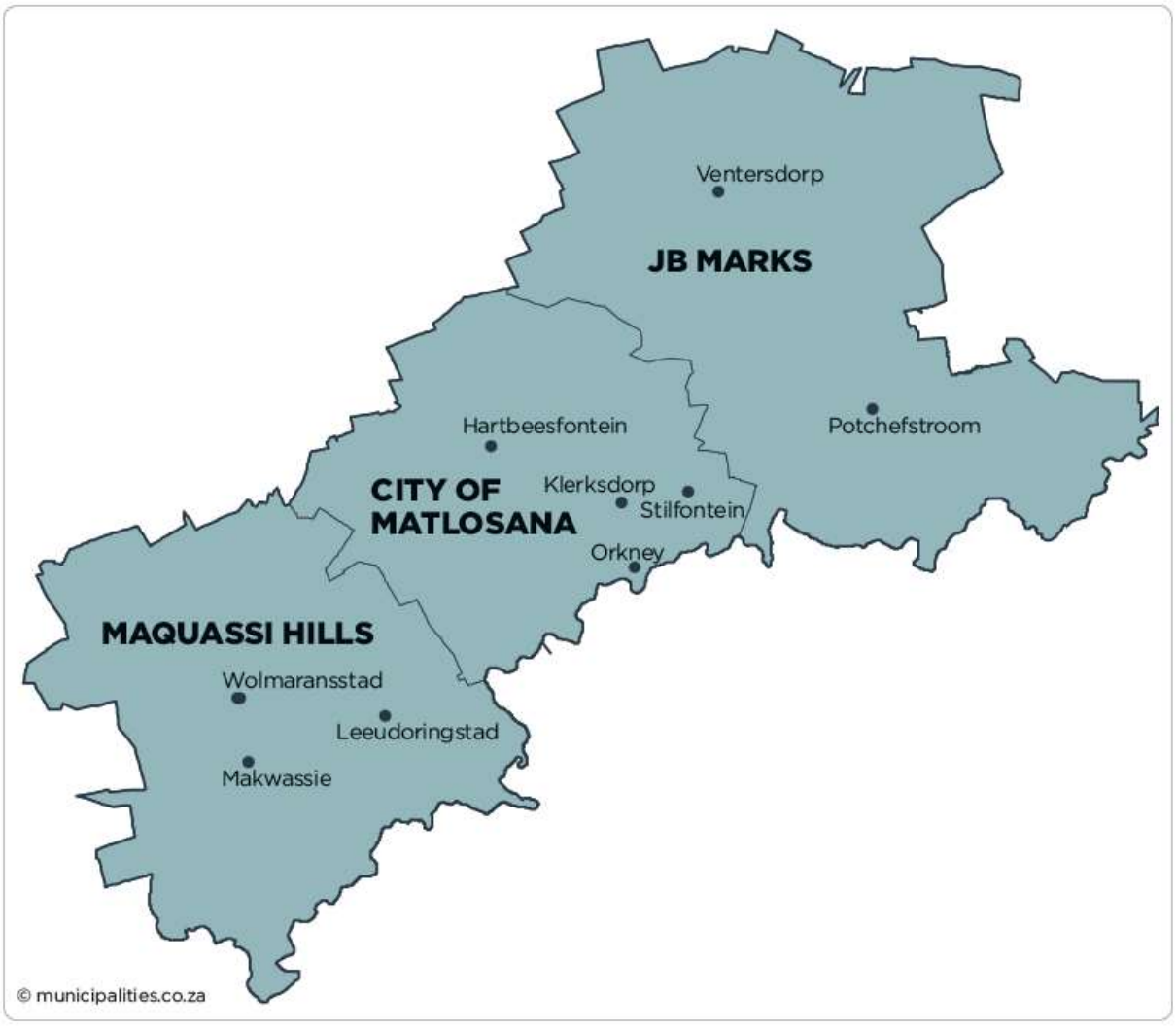

Figure 56: Local Municipalities within the Dr Kenneth Kaunda District (Savannah, 2022)

5.10.4 Baseline Description of the Social Environment

The table below provides a baseline summary of the socio-economic profile of the City of Matlosana Local Municipality within which Roan 2 PV Facility is proposed. To provide context against which the Local Municipality's socio-economic profile can be compared, the socio-economic profiles of the Dr Kenneth Kaunda District, North West Province, and South Africa have also been provided where applicable. The data presented in this section have been derived from the 2011 Census, the North West Provincial Spatial Development Framework (PSDF), and the Dr Kenneth Kaunda DM and City of Matlosana LM IDPs.

Table 35: Baseline description of the socio-economic characteristics of the area within which the Roan 2 PV Facility (Savannah, 2022)

Location characteristics
• The project is proposed within the North West Province, the province located to the west of the major population centre of Gauteng Province. • The project is proposed within the City of Matlosana LM of the Dr Kenneth Kaunda DM. • The City of Matlosana LM is approximately 3 608.6km² in extent.
Population characteristics
• The City of Matlosana LM has a population of 417 282 which is about three-fifths of the figure in Dr Kenneth Kaunda 742,822. • The LM occupies an area of land approximately 3 608.6km² in extent and has a population density of 115.6km². • According to estimates based on the population growth rate of SA Statistics (1.04%) and the Matlosana Socio-Economic Report. • Population growth and household growth has declined over time. This can be ascribed to the fact that the local economy has become less dependent on the mining sector with the tertiary sectors growing in the long term. • Downscaling in terms of economic activity in the LM has lead to nearly 80% of the original workforce in 1996 being retrenched by 2016. • The declining mining industry has resulted in the number of people living in poverty in the City of Matlosana almost doubling between 1999 and 2019. • The average annual household growth between 1996 and 2019 was 3.46%. • The dependency ratio is high at 50.7% of the KM population (that is half the local population) which puts pressure on the Economically Active Population and local municipalities. • The dependency ration indicates the number of individuals that are below the age of 15 and over the age of 65, that are dependent on the Economically Active Population (individuals that are aged 15-64 that are either employed or actively seeking employment.
Economic, education and household characteristics
• According to Census 2011 the unemployment rate for the LM is high at 32.7% whilst youth unemployment rate is 43.1%. • There is 40.4% of the population which is employed under the LM. 4.3% represent discouraged work – seeker, 35.7% are not economically active whilst 19.6% are unemployed. • The LM is largely populated by potentially economically active and young people. • There is a high number of households that fall within a low-income category and within the poverty level, this is being 62.1% of the local population. • A low percentage of households fall within the middle-income category (33.1% of the population) and high income category (4.7%). • Majority of the population live in urbanised areas within formal dwellings. • A large number of people in the LM have access to basic services. • Approximately 69.9% have completed Grade 9 or higher which is a little higher than the rate of Dr Kenneth Kaunda 67.26% • According to Census 2011, R2 400 is the average annual income for employed children between 15 and 17. • 13.6% of children between 15 and 17 are in the labour force. • There is 526 households with heads under 18 years old and 9.3% of child-headed households that are informal dwellings (shacks). • There is 45.4% child-headed households with women as their head. • The average child-headed household income for the LM is R2400.
Services

- According to Community Survey 2016, 96.2% of the population are getting water from regional or local service provider which is a little higher that the rate of Dr Kenneth Kaunda (93.33%)
- 48.3% have piped water inside the yard, 47.8% have piped water inside the house, 1.8% have public/communal tap whilst 0.7% have borehole outside the yard.
- 3.7% have no access to electricity and which is about three quarters of the rate in Dr Kenneth Kaunda (5.12%)
- 77.7% have in-house prepaid meter, 17.2% in-house conventional meter, 3.7% have no access to electricity and 1.1% use other source (not paying for)
- 95.7% have access to flush or chemical toilets which is a little higher than the rate in Dr Kenneth Kaunda 90.07%, whilst 2% have no access to any toilets.
- 94.1% are getting refuse disposal from local authority, private company or community members, which is about 10% higher than the rate in Dr Kenneth Kaunda (82.71%).

5.11 VISUAL CONTEXT

Mr Stephen Stead of Visual Resource Management Africa (VRMA) undertook a Visual Impact Assessment of the proposed Roan 2 PV (See Appendix E7). The following visual context was determined from this study.

5.11.1 Regional Locality

The proposed Roan 2 PV Solar Facility is located 3 km south of the town of Hartbeesfontein in the North West Province of South Africa. Like many small rural towns, infrastructure is degraded. The large silo located to the south of the town is the main landscape feature. Within the regional context, the property is located in a rural agrarian landscape predominantly related to maize production, but also including cattle farming. To the east towards Klerksdorp, there is a strongly landscape context of mining, with the now non-operational Rietkuil Uranium Mine located adjacent to the Roan PV1 site. Also clearly visible is the Tailing Storage Facility located to the east of the site. Some rehabilitation has taken place but only on the crest, but this is marginal and with the sides of the tailings eroding, creates a clear mining landscape feature.

5.11.2 Vegetation

Vegetation type is a large factor in determining the scenic quality of the site in terms of colour and texture, as well as influencing the local ability of the landscape to absorb the landscape change. The Klerksdorp area falls within the grassland biome comprising a wide range of grasses typical of arid areas.

5.11.3 Mountain and Hill Features

The Matlosana municipal area has a slightly irregular undulating topography dictated by the Vredefort event, which brought about the Vredefort Dome near Parys. The height above sea level ranges between 1 300m and 1 600m, increasing in a general north-westerly direction. The ridges and hills of Klerksdorp have a characteristic range of different aspects, slopes, altitudes, soils and hydrological conditions conducive to heterogeneous abiotic conditions that provide a greater diversity of potential niches for plants and animals than homogeneous landscapes. As a result, many Red Data or threatened species of plants and animals inhabit ridges. In

As depicted in the photograph below, the Renosterberg Hill is located adjacent to the project area on the western border of the southern portion of the site. The elevated views from this landscape feature have been use

Figure 57: Photograph of the Renosterberg Hills located to the east of the site (Stead, 2022)

5.11.4 Infrastructure, Mining and Road Access

There are not significant roads or major infrastructure located within the project Zone of Visual Influence (ZVI). The main road past the site is the Hartbeesfontein / Dominionville tarred road that connects the main roads of R503 (north) to the N12 (south). There are no significant tourist destinations in the regional vicinity that would result in tourist related traffic making use of the minor roads located with the project ZVI. There is a substation located to the northeast of the site that provided electricity to the closed Rietkuil Uranium Mine. There is a large power line corridor linking to the substation but this routes to the east away from the proposed site.

Figure 58: Photograph of Rietkuil Substation (Stead, 2022)

Figure 59: Photograph of partially rehabilitated Rietkuil Tailings Storage Facility as seen from the Southern PV1 site (Stead, 2022)

5.11.5 Nature and Tourism Activities

As depicted in **Figure 60** below, the nearest significant nature conservation areas are the Bosworth and Faan Mentjies Private Nature Reserve. These facilities are not located in the project ZVI.

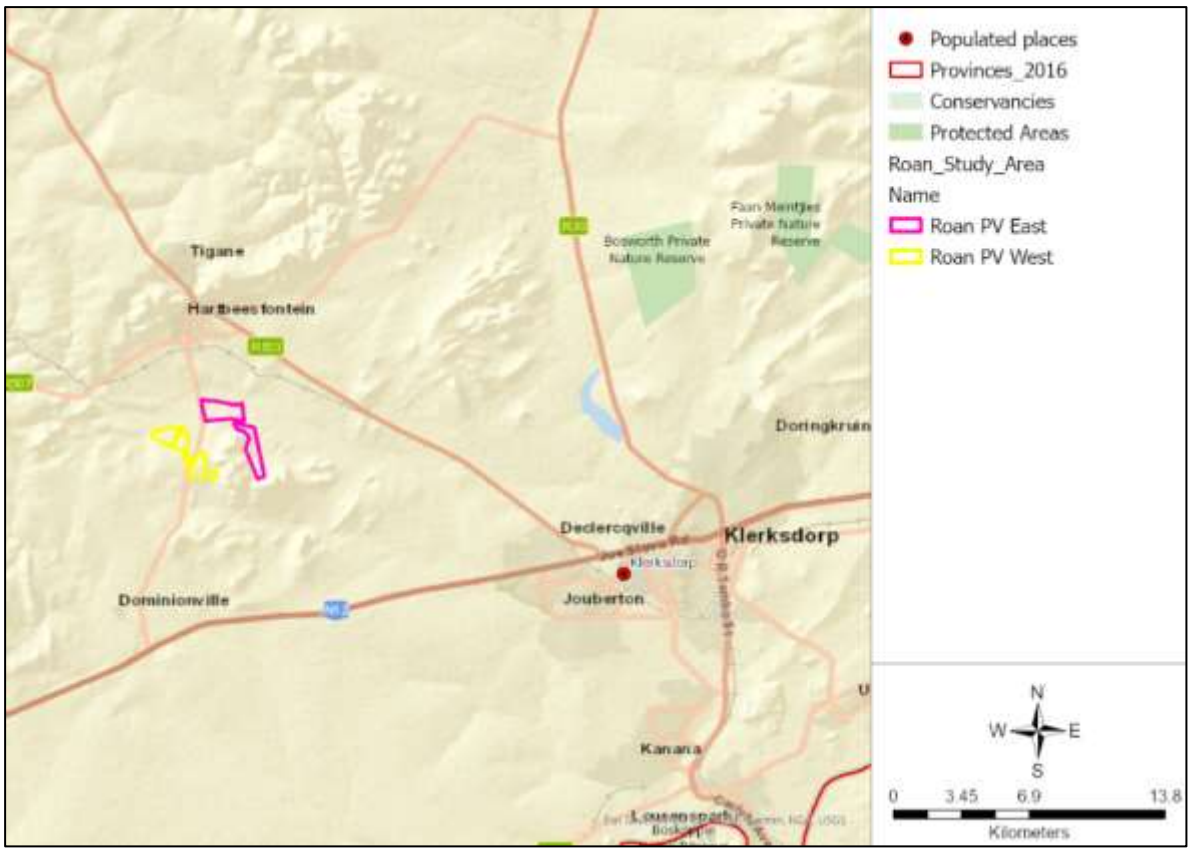

Figure 60: Map depicting the mapped tourism activities outside of the project viewshed (Stead, 2022)

The nearest tourist related activity is the Renosterberg Safari located adjacent to the site. The area is well established with game and includes two accommodation areas. The following photographs depict the accommodation units. The views from the accommodation look due east and as such would not overlook the proposed PV areas. Tourist making use of the site would have clear views of the PV landscape change as seen from the Renosterberg Hill..

Figure 61: Photographs depicting the main accommodation that will not have views to the PV2 project (Stead, 2022)

6. IMPACT ASSESSMENT

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

- Terrestrial Biodiversity (Anthene Ecological Cc, 2022)
- Avifauna (Chris van Rooyen Consulting, 2022)
- Plant Species (Anthene Ecological Cc, 2022)
- Animal Species (Anthene Ecological Cc, 2022)
- Aquatic Biodiversity (Anthene Ecological Cc, 2022)
- Agricultural (Johan Lanz 2022)
- Palaeontology (Prof Marion Bamford, 2022)
- Archaeology and Heritage (Beyond Heritage, 2022)
- Visual (Stephen Stead, 2022)
- Socio Economic (Savannah Environmental, 2022)
- Traffic Impact Assessment (JG Afrika, 2022)
- Stormwater Management (JG Afrika, 2022)

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

6.1 ASSESSMENT METHODOLOGY

All possible impacts need to the 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 Roan 2 PV have been described in terms of whether they are negative or positive and to what extent.
- **Duration of impacts**: Impact 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 1) and the No-Go Alternative 1 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.

6.2 IDENTIFICATION OF IMPACTS ASSESSED

This section simply lists the potential key impacts identified and assessed by the various specialists (more details on the significance and ratings of these impacts are provided in section 6.4 – 6.11 below and in the specialist reports attached in Appendix E).

6.2.1 Terrestrial Biodiversity Impacts Assessed

6.2.1.1 Construction Phase Impacts

- Loss of habitat owing to the removal of vegetation at the proposed development.
- Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of connectivity and conservation corridor networks in the landscape.
- Contamination of soil during construction in particular by hydrocarbon spills.
- Killing of vertebrate fauna during the construction phase.

6.2.1.2 Operational Phase Impacts

- An increased infestation of exotic or alien invasive plant species owing to disturbance.

6.2.1.3 Decommissioning Phase Impacts

The decommissioning phase impacts are deemed to be the same as the construction phase impacts and will include:

- Loss of habitat owing to the removal of vegetation at the proposed development.
- Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of connectivity and conservation corridor networks in the landscape.
- Contamination of soil during construction in particular by hydrocarbon spills.
- Killing of vertebrate fauna during the construction phase.

6.2.2 Agricultural Impacts Assessed[37]

- Loss of agricultural potential by occupation of land.
- Loss of agricultural potential by soil degradation
- Enhanced agricultural potential through increased financial security for farming operations.[38]
- Improved security against stock theft and other crime due to the presence of security infrastructure and security personal at the facility.[39]

6.2.3 Avifaunal Impacts Assessed

6.2.3.1 Construction Phase Avifaunal Impacts

- Displacement due to disturbance and habitat transformation associated with the construction of the solar PV plant and associated infrastructure.

6.2.3.2 Operational Phase Avifaunal Impacts

[37] The agricultural impacts identified apply equally to all phases of the development.

[38] This is deemed to be a positive agricultural impact.

[39] This is deemed to be a positive agricultural impact.

- Collisions with the solar panels
- Entrapment in perimeter fences
- Electrocutions in the onsite substations
- Collisions with the 132kV grid connection

6.2.3.3 Decommissioning Phase

- Displacement due to disturbance associated with the decommissioning of the solar PV plant and associated infrastructure.

6.2.4 Aquatic Biodiversity Impacts Assessed

6.2.4.1 Construction Phase Aquatic Biodiversity Impacts

- Loss of riparian habitat owing to the removal of vegetation at the proposed footprint for development.
- Changes in flow regime.
- Exposure of soil leading to soil compaction and/ or erosion.
- Loss of sensitive wetland/ riparian species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of riparian connectivity and conservation corridor networks in the landscape.
- Contamination of riparian soil during construction in particular by hydrocarbon spills.
- Contamination of habitat by littering and dumping of rubble/ construction material.
- Poor recovery of soils that were exposed and compacted during the construction phase.

6.2.4.2 Operational Phase Aquatic Biodiversity Impacts

- An increased infestation of exotic or alien invasive plant species owing to disturbances associated with the proposed development.
- Poor recovery of soils that were exposed and compacted during the construction phase.

6.2.4.3 Decommissioning Phase Aquatic Biodiversity Impacts

The decommissioning impacts are deemed to be similar to those outlined for the construction phase.

6.2.5 Heritage Impacts Assessed[40]

- Impact on the Stone cairn - R001
- Impact on the Stone Age site RB002.
- Impact on the dwelling ruin at R003
- Impact the Stone Age scatter RB004

6.2.6 Visual Impacts Assessed

6.2.6.1 Construction Phase Visual Impacts:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

6.2.6.2 Operational Phase Visual Impacts

- Massing effect in the landscape from a large-scale modification.

[40] Impact on heritage resources will occur in the construction phase and that impact will remain.

- Soil erosion.
- Windblown dust..

6.2.6.3 Decommissioning phase Visual Impacts

- Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations.
- Wind-blown dust from impacts to vegetation.
- Wind-blown litter from the laydown and deconstruction sites

6.2.7 Traffic Impacts Assessed

6.2.7.1 Construction phase Traffic Impacts

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching for electrical cables and other ancillary construction works that will temporarily generate the most traffic.

6.2.7.2 Operational phase Traffic Impacts

The traffic generated during the operational phase will be minimal and will not have an impact on the surrounding road network.

6.2.7.3 Cumulative Traffic Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

6.2.8 Social Impacts Assessed

6.2.8.1 Construction Phase Social Impacts

- Direct and indirect employment opportunities
- Economic multiplier effects
- Influx of jobseekers and change in population
- Safety and security impacts
- Impacts on daily living and movement patterns
- Nuisance impacts, including noise and dust
- Visual impacts and sense of place impacts

6.2.8.2 Operational Phase Social Impacts

- Direct and indirect employment opportunities
- Development of non-polluting, renewable energy infrastructure
- Contribution to Local Economic Development (LED) and social upliftment
- Visual and sense of place impacts
- Impacts associated with the loss of agricultural land

6.3 SITE SENSITIVITY CONSTRAINTS AND POTENTIAL RISKS & IMPACTS

The following spatial site-specific constraints were identified by various specialists and the EAP during the initial stage of the environmental process.

Table 36: Summary of potential site constraints identified during the initial phase of the BAR Process, and which are assessed in the section below.

Specialist Discipline	Site Constraints
Terrestrial Biodiversity.	Koppie / Ridge
Animal Species	Sensitive habitat associated with the Koppie, Ridge, and the non perennial watercourse.
Plant Species	Sensitive habitat associated with the Koppie, Ridge, and the non perennial watercourse.
Aquatic Biodiversity	non perennial watercourse and in channel dams
Avifauna	All water sources, including man mad reservoirs within the study site.
Agricultural	No specific spatial constraints identified.
Heritage	No specific spatial constraints identified
Visual	Scenic receptors most notably the Renosterberg Safar operations. The views from Renosterberg Safari are not towards Roan 2 PV.
Traffic	Insufficient line of site distance at one of the existing farm access points to Roan 2 PV East.
Social	No specific spatial constraints identified
Stormwater	Stormwater management buffer along the main river channel.

The preferred layout (layout alternative 1) was developed to exclude the rocky outcrop, non perennial watercourse, in stream dam and associated buffers as shown in the image below.

Figure 62: Roan 2 PV Showing the exclusion of the identified ecologically sensitive areas and associated buffers.

The stormwater specialist identified a on the main water course. This stormwater buffer was also incorporated into the preferred alternative (Layout Alternative 1) as shown in the image below.

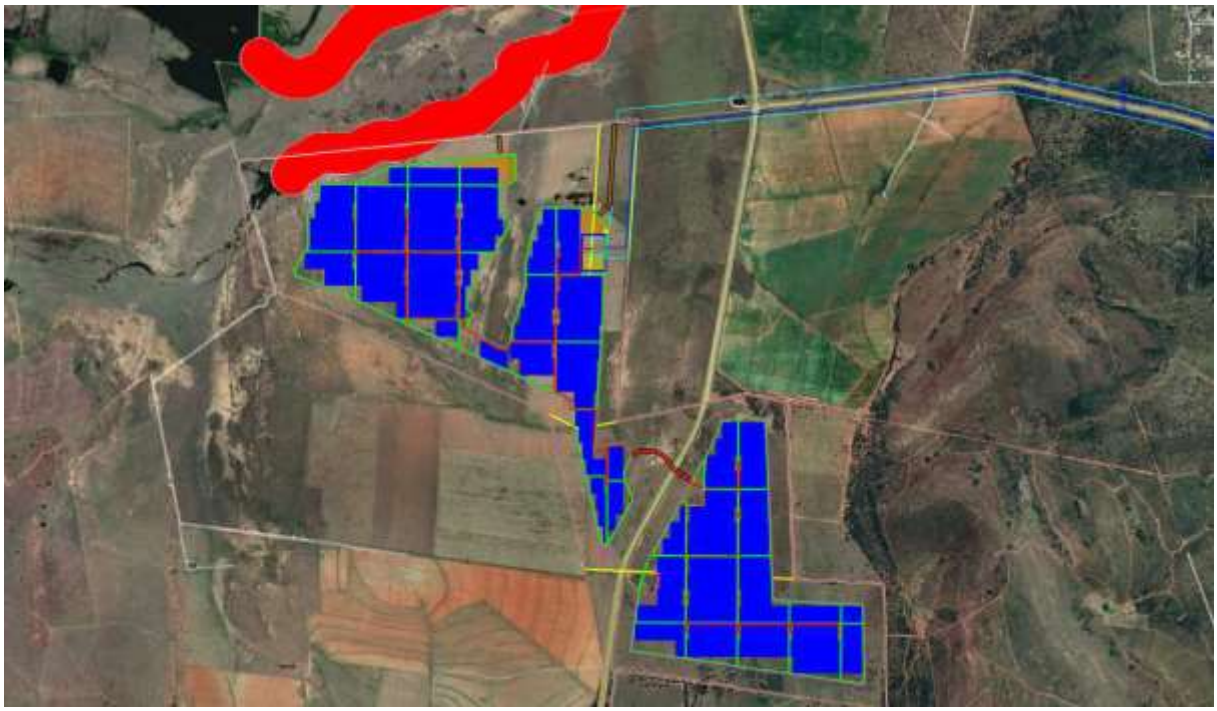

Figure 63: Roan 2 PV Showing exclusion of the stormwater management buffers.

The visual specialist produced a viewshed from the main camp of Renosterberg Safaris. The proposed Roan 2 PV is not within this viewshed as depicted in the image below.

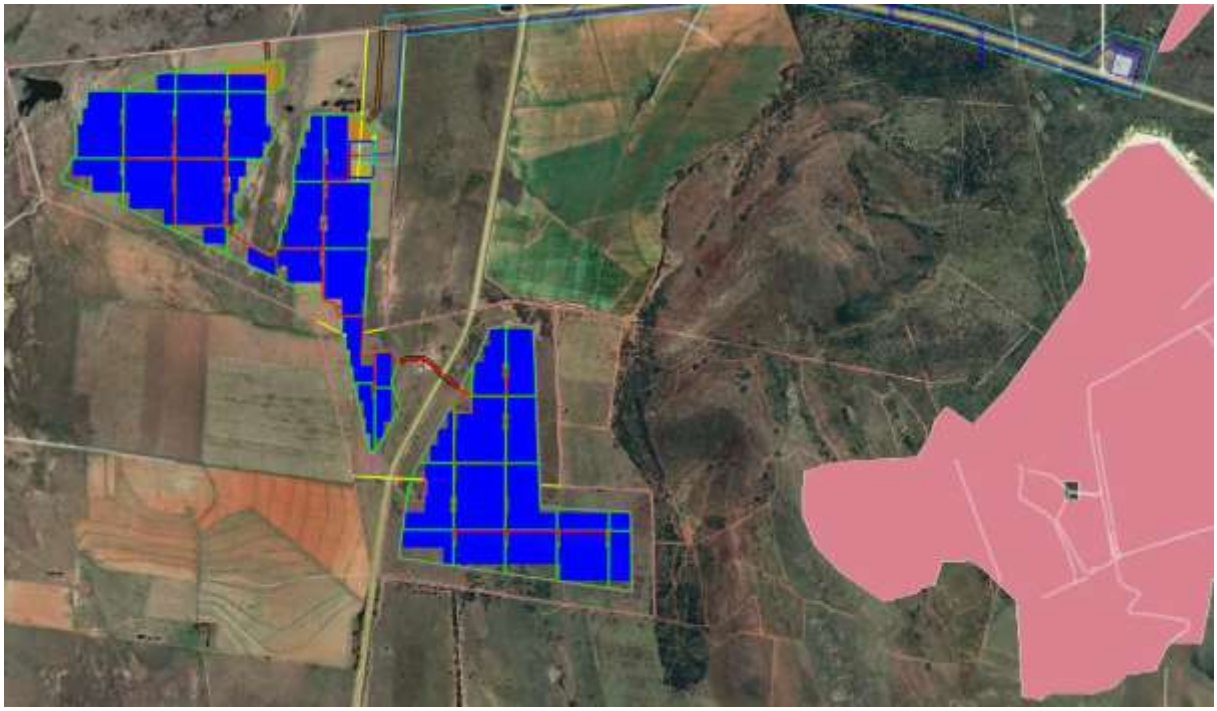

Figure 64: Roan 2 PV outside of the viewshed from the Renosterberg Safaris, main camp.

The avifaunal specialist furthermore recommended various buffers around water resources (including reservoirs and livestock drinking troughs). These buffers were incorporated into the preferred layout as shown in the image below.

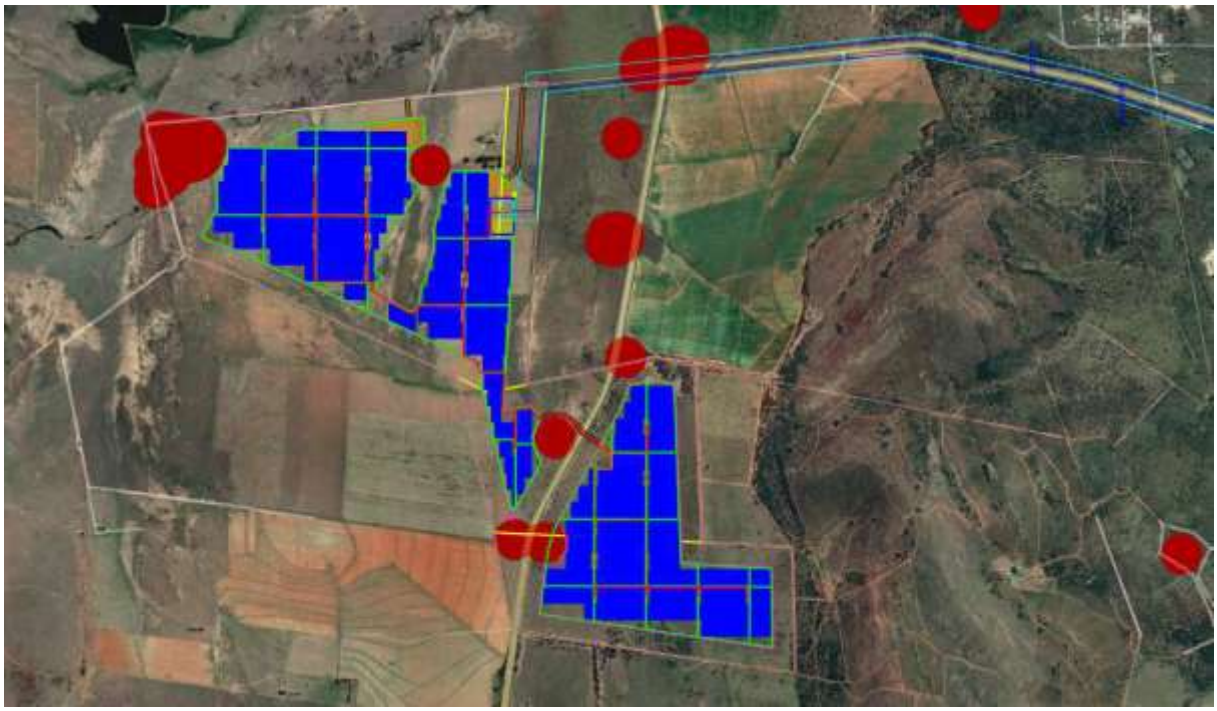

Figure 65: Roan 2 PV showing exclusion of all buffer areas identified by the Avifaunal specialist.

Kindly refer to section 2.9 and section 2.10 above and the detailed layout plan in Appendix D for details as to how the preferred alternative incorporated these sensitive features.

In summary, the following sensitive features were all entirely avoided by the preferred footprint of Roan 2 PV:

- All high and very high sensitivity terrestrial and aquatic biodiversity features and their buffers.
- All avifaunal buffers
- All Stormwater management buffers
- The entire viewshed from the Renosterberg Safaris main camp.

6.4 TERRESTRIAL BIODIVERSITY IMPACTS

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

The following potential impacts were identified by the specialist and are assessed in the tables below:

Construction Phase

- Loss of habitat owing to the removal of vegetation at the proposed development.
- Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of connectivity and conservation corridor networks in the landscape.
- Contamination of soil during construction in particular by hydrocarbon spills.
- Killing of vertebrate fauna during the construction phase.

Operational Phase

- An increased infestation of exotic or alien invasive plant species owing to disturbance.

6.4.1 Construction Phase Terrestrial Biodiversity Impacts[41]

Table 37: Assessment of Construction Phase Terrestrial Biodiversity Impacts.

Aspect/Activity	Clearance of vegetation at part of the site for the development
Type of Impact (i.e. Impact Status)	Direct
Potential Impact	Clearing of vegetation at the proposed development. This will entail the partial destruction of habitat of medium and low ecological sensitivity.
Status	Negative
Mitigation Required	Non-perennial active channels and riparian zones with 30 m bufferzones, as well as the rocky ridge area with 30 m buffer zones, are excluded from the development.
Impact Significance (Pre-Mitigation)	**High**
Impact Significance (Post-Mitigation)	**Moderate**
Risk	Following the mitigation measures a moderate risk of impact is expected.

Aspect/Activity	Removal of sensitive species
Type of Impact (i.e. Impact Status)	Direct
Potential Impact	Sensitive species: Presence of Threatened or Near Threatened Plants, Mammals, Reptiles, Amphibians and Invertebrates at the site appear to be unlikely.
Status	Negative.
Mitigation Required	No specific mitigation measures for Threatened or Near Threatened sensitive species at the site apply at the site.
Impact Significance (Pre-Mitigation)	**Moderate**
Impact Significance (Post-Mitigation)	**Low**
Risk	A low risk of threat to any sensitive species at the site is anticipated.

Aspect/Activity	Fragmentation of corridors of particular conservation concern
Type of Impact (i.e. Impact Status)	Direct
Potential Impact	Non-perennial rivers, as well as the area where a rocky ridge enters the site are corridors of particular conservation concern.
Status	Negative
Mitigation Required	Active channels with riparian zones with 30 m bufferzones as well as area where a rocky ridge enters the site with 30 m buffer zones are excluded from the development.
Impact Significance (Pre-Mitigation)	**High**
Impact Significance (Post-Mitigation)	**Low**
RISK	Following mitigation, a low impact risk is expected.

Aspect/Activity	Contamination of soil by leaving rubble/ waste or spilling petroleum fuels or any pollutants on soil which could infiltrate the soil
Type of Impact (i.e. Impact Status)	Direct

[41] The impact tables in this section reflect those of the preferred alternative (Layout Alternative 1. Cumulative and no-go impacts assessed in following separate sections.

Potential Impact	Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils.
Status	Negative
Mitigation Required	Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.
Impact Significance (Pre-Mitigation)	**Moderate**
Impact Significance (Post-Mitigation)	**Low**
Risks	A low risk is expected following mitigation.

Aspect/Activity	**Possible disturbance, trapping, hunting and killing of vertebrates during construction phase**
Type of Impact (i.e. Impact Status)	Direct
Potential Impact	During the construction phase animal species could be disturbed, trapped, hunted or killed.
Status	Negative
Mitigation Required	If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed during the construction phase.
Impact Significance (Pre-Mitigation)	**Moderate**
Impact Significance (Post-Mitigation)	**Low**
RISKS	Following mitigation a low risk is anticipated.

6.4.2 Operational Phase Terrestrial Biodiversity impacts[42]

Table 38: Assessment of Operational Phase Terrestrial Biodiversity Impacts.

Aspect/Activity	**An increased infestation of exotic or alien invasive plant species owing to clearance or disturbance where the footprint took place.**
Type of Impact (i.e. Impact Status)	Direct
Potential Impact	Infestation by alien invasive species could replace indigenous vegetation or potential areas where indigenous vegetation could recover. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia* azedarach (Syringa) or alien invasive Australian *Acacia* species (Australian Wattles) that should not be allowed to establish. Once established these combatting these alien invasive plant species may become very expensive in the long term.
Status	Negative
Mitigation Required	Continued monitoring and eradication of alien invasive plant species are imperative. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia azedarach* (Syringa) and alien invasive Australian *Acacia* species (Australian wattles) that should not be allowed to establish.
Impact Significance (Pre-Mitigation)	**Moderate**

[42] The impact tables in this section reflect those of the preferred alternative (Layout Alternative 1. Cumulative and no-go impacts assessed in following separate sections.

Impact Significance (Post-Mitigation)	Low
RISKS	Following mitigation, a low risk is anticipated.

6.4.3 Decommissioning Phase Terrestrial Biodiversity Impacts

It is likely that the decommissioning phase Terrestrial Biodiversity impacts will be similar to those encountered during the construction phase. Please refer to the tables above for the assessment of the Terrestrial Biodiversity Impacts during the construction phase.

6.4.4 Concluding Statement – Terrestrial Biodiversity Impacts

Ecological sensitivity at the site ranges from high and medium to low. Ecological sensitivity at the cultivated areas is low. Ecological sensitivity at the disturbed savanna-like grassland at the site is medium. Ecological sensitivity at the non-perennial active channels with riparian zones, as well as the rocky ridge that enters the site, is high owing to the importance of the watercourses and rocky ridge as conservation corridors for biodiversity in the larger area. These rocky ridges and non perennial watercourses have been excluded from the preferred layout alternative.

No Threatened or Near Threatened animal or plant species appear to be resident at the site.

Two plant species, which are not threatened but listed as Declining occur at the site: Boophone disticha and Hypoxis hemerocallidea (Star Flower). A search and rescue operation should apply for these plant species.

The non-perennial rivers (with active channel, riparian zone and buffer zone) as well as the area where a rocky ridge enters the site and their buffer zones are excluded from the development. Risks and possible impacts to the watercourses if the bufferzone is upheld, are not expected to be significant because excessive surface flow and erosion are not anticipated. There is no distinct indication that interflow plays an important role in the maintenance of the watercourse. The geomorphological setting and flow regime will not be impacted. Loss of any wetland animal or plant species are not expected.

The specialist has confirmed that from an ecological perspective the proposed development is found to be acceptable, (i.e the proposed footprint of the photovoltaic power plant, associated infrastructure as well as the powerline that would connect the photovoltaic power plant to the national grid)

6.5 AVIFAUNAL IMPACTS

An Avifaunal Impact Assessment was undertaken by Mr Chris van Rooyen of Chris van Rooyen Consulting and is attached in Annexure E3**.** The following has been summarised from this assessment.

The specialist identified the following avifaunal impacts that have been assessed further in the tables below:

Construction Phase

- Displacement due to disturbance and habitat transformation associated with the construction of the solar PV plant and associated infrastructure.

Operational Phase

- Collisions with the solar panels
- Entrapment in perimeter fences
- Electrocutions in the onsite substations
- Collisions with the 132kV grid connection

Decommissioning Phase

- Displacement due to disturbance associated with the decommissioning of the solar PV plant and associated infrastructure.

6.5.1 Construction Phase Avifaunal Impacts

Table 39: Assessment of Avifaunal Impacts during the construction phase.

Displacement of priority species due to disturbance and habitat transformation associated with construction of the PV plant and associated infrastructure		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	High	High
Duration	Long term	Long term
Extent	Local	Local
Consequence	High	High
Probability	Definite	Probable
Significance	**High**	**High**
Status	Negative	Negative
Confidence	Medium	Medium
Degree to which impact can be reversed	Low	
Degree to which impact may cause irreplaceable loss of resources	High	
Degree to which impact can be mitigated	Low	
PROPOSED MITIGATION		
• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum. • The mitigation measures proposed by the botanical specialist must be strictly enforced. • A 100m solar panel exclusion zone must be maintained around sensitive areas i.e. rivers, pans, dams, water reservoirs and wetlands.		

6.5.2 Operational Phase Avifaunal Impacts

Table 40: Assessment of Avifaunal Impacts During the operational phase

Mortality of priority species due to collisions with the solar panels		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	Low	Low
Duration	Long term	Long term
Extent	Local	Local
Consequence	Low	Low
Probability	Possible	Possible
Significance	Very low	Very low
Status	Negative	Negative
Confidence	Medium	Medium
Degree to which impact can be reversed	Irreversible	
Degree to which impact may cause irreplaceable loss of resources	Low	

Mortality of priority species due to collisions with the solar panels	
Degree to which impact can be mitigated	Low
PROPOSED MITIGATION	
A 100m solar panel exclusion zone must be maintained around sensitive areas i.e. rivers, pans, dams, water reservoirs and wetlands.	

Entrapment of birds in the perimeter fence		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	Medium	Medium
Duration	Long term	Long term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Confidence	Medium	Medium
Degree to which impact can be reversed	Irreversible	
Degree to which impact may cause irreplaceable loss of resources	Low	
Degree to which impact can be mitigated	Medium	
PROPOSED MITIGATION		
• Increasing the spacing between at least the top two wires (to a minimum of 30cm) and ensuring they are correctly tensioned will reduce the snaring risk. • If possible, a single perimeter fence should be used.		

Electrocution of priority species in the onsite substations.		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	Medium	Medium
Duration	Long term	Long term
Extent	Local	local
Consequence	Medium	Medium
Probability	Possible	Improbable
Significance	Low	Low
Status	Negative	Negative
Confidence	High	High
Degree to which impact can be reversed	Irreversible	
Degree to which impact may cause irreplaceable loss of resources	Low	
Degree to which impact can be mitigated	Medium	
PROPOSED MITIGATION		
Due to the complicated design of the substation hardware, pro-active mitigation is not a practical option. Instead, the situation must be monitored, and should electrocutions of priority species be recorded, reactive mitigation could be applied in the form of insulation of live components.		

Mortality of priority species due to collisions with the 132kV OHL		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	Medium	Medium
Duration	Long term	Long term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Probable	Possible
Significance	Medium	Low
Status	Negative	Negative
Confidence	High	High
Degree to which impact can be reversed	Medium	
Degree to which impact may cause irreplaceable loss of resources	Low	
Degree to which impact can be mitigated	Medium	
PROPOSED MITIGATION		
The whole grid connection needs to be marked with Eskom approved bird flight diverters. The bird flight diverters should be installed on the full span length on the earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung.		

6.5.3 Decommissioning Phase Avifaunal Impacts

Table 41: Assessments of Avifaunal Impacts during the decommissioning phase.

Displacement of priority species due to disturbance associated with decommissioning of the PV facility and associated infrastructure.		
CRITERIA	**WITHOUT MITIGATION**	**WITH MITIGATION**
Intensity	High	High
Duration	Short term	Short term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite	Definite
Significance	**Medium**	**Medium**
Status	Negative	Negative
Confidence	High	High
Degree to which impact can be reversed	High	
Degree to which impact may cause irreplaceable loss of resources	Low	
Degree to which impact can be mitigated	Low	
PROPOSED MITIGATION		
• Decommissioning activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry.		

6.5.4 Concluding Statement – Avifauna

The study area and immediate environment is classified as Low to Medium sensitivity for terrestrial animals according to the Terrestrial Animal Species Theme. The medium sensitivity classification is not linked to avifauna. The project site contains marginal habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020, namely listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable. The absence of SCC at the Roan 2 development area was confirmed during the site surveys. Based on these criteria, the development area is correctly classified as Low sensitivity for avifauna. No fatal flaws were discovered during the investigations. The specialist has therefore recommended that the activity be authorised, on condition that the proposed mitigation measures as detailed in the Impact Tables and the EMPr are strictly implemented.

6.6 AGRICULTURAL IMPACTS

Mr Johann Lanz completed a specialist assessment of the potential impacts of Roan 2 PV on the agricultural environment. A copy of this assessment is attached in Annexure E3, and the outcome of the assessment is summarised below.

The agricultural specialist identified 3 potential direct negative impacts on agricultural resources:

- **Loss of agricultural potential by occupation of land** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use, with consequent potential loss of agricultural productivity and employment. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
- **Loss of agricultural potential by soil degradation** – This impact only becomes relevant once the land is returned to agricultural land use after decommissioning. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact occurs only during the construction and decommissioning phases. Due to the very low slope of the land, the site has a low susceptibility to soil erosion.
- **Dust impact** – The disturbance of the soil surface, particularly during construction, will generate dust that can negatively impact surrounding veld and farm animals.

The specialist furthermore identified two positive agricultural impacts:

- **Enhanced agricultural potential through increased financial security for farming operations -** Reliable income will be generated by the farming enterprises through the lease of the land to the energy facility. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased investment into farming.
- **Improved security against stock theft and other crime due to the presence of security infrastructure and security personal at the facility.**

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6.6.1 Assessment of Agricultural Impacts

All agricultural impacts of this proposed development are assessed as being of **low significance.** For the following reasons:

- The proposed development will occupy land that is of very limited land capability and is totally unsuitable for the production of cultivated crops. There is not a scarcity of such agricultural land in South Africa and its conservation for agriculture is not therefore a priority.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.
- The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits.

6.6.2 Cumulative agricultural impacts

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The potential cumulative agricultural impact of importance is a regional loss of agricultural land, with a consequent decrease in agricultural production.

There are 3 other renewable energy project applications within 30km of the proposed site.. In addition, there is a second PV project associated with this current development and this has also been included in the consideration of cumulative impact in this report.

The cumulative impact is affecting an agricultural environment that has been declared a REDZ precisely because it is an environment that can accommodate numerous renewable energy developments without exceeding acceptable levels of agricultural land loss.

In quantifying the cumulative impact, the area of land taken out of agricultural production (grazing) as a result of all 5 developments (total generation capacity of 436 MW) will amount to a total of approximately 1,090 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 0.39% of the surface area. That is well within an acceptable limit in terms of loss of grazing land, of which there is no particular scarcity in the country. This is particularly so when considered within the context of the following point.

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of lower potential agricultural land in a region which has been designated as a REDZ, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country.

It should also be noted that there are few land uses, other than renewable energy, that are competing for agricultural land use in this area. The cumulative impact from developments, other than renewable energy, is therefore likely to be low.

Because the power line component leads to insignificant agricultural land loss, its cumulative impact must also logically be insignificant. It therefore does not make sense to conduct a more formal assessment of cumulative power line impacts as per DFFE requirements. Many times more power lines than currently exists, or are currently proposed, can be accommodated before acceptable levels of change in terms of agricultural land loss are exceeded. Acceptable levels of change in terms of other types of impact, for example visual impact, would be exceeded long before the levels for agricultural

impact became an issue. In reality the landscape in this environment could be covered with power lines and agricultural production would continue, largely unaffected.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved..

6.6.3 Concluding Statement - Agriculture

The agricultural impact of this proposed development was assessed by the specialist as having a low significance.

The conclusion of the agricultural assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site.

The agricultural specialist furthermore confirmed that from an agricultural impact point of view, the proposed development is considered acceptable and it is recommended that it be approved..

6.7 HERITAGE IMPACTS

A detailed Heritage Impact Assessment including and Archaeological Impact Assessment, Palaeontology Impacts Assessment was undertaken by Mr Jaco van der Walt of Beyond Heritage. A copy of these assessments are attached in Annexures E5 and E6 and the outcome of the various assessments are summarised below.

During the pre-construction and construction the specialist has assumed that the topsoil and vegetation would be disturbed for the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

No impacts are expected during the operation phase.

The tables below outline the assessment of the impacts on the heritage resources identified during the assessment.

Table 42. Impact assessment of the proposed project on the Stone cairn - R001

Nature: 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 (Preservation/ excavation of site)**
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	**Low**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: • Preservation of the feature in situ if this is not possible confirmation of whether the feature represents a grave (either through social consultation/ test excavation with the relevant permits) prior to construction; • Implementation of a chance find procedure for the project.		
Cumulative impacts: With the implementation of the mitigation measures in this report the proposed project will have a low cumulative impact on heritage resources.		
Residual Impacts:		

Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.

Table 43: Impact assessment of the proposed project on the Stone Age site RB002.

Nature: 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 (Preservation/ excavation of site)**
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Moderate	Low
Probability	Probable	Improbable
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Avoidance and in situ preservation of the site, if this cannot be achieved mitigation will be required (surface sampling and test excavation) subject to a Section 35 SAHRA permit.		
Cumulative impacts: With the implementation of the mitigation measures in this report the proposed project will have a low cumulative impact as archaeological data will not be lost.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Table 44: Impact assessment of the proposed project on the dwelling ruin at R003

Nature: 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 (Preservation/ excavation of site)**
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Low	Low
Probability	Probable	Improbable
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Preservation of the feature in situ if this is not possible confirmation of whether graves are present through social consultation prior to construction.		
Cumulative impacts: With the implementation of the mitigation measures in this report the proposed project will have a low cumulative impact on heritage resources.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Table 45: Impact assessment of the proposed project on the Stone Age scatter RB004

Nature: 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 (Preservation/ excavation of site)**
Extent	Local	Local
Duration	Permanent	Permanent
Magnitude	Minor	Minor
Probability	Probable	Probable

Significance	**Low**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: The artefact density is too low and scattered too sparsely to be of significance apart from mentioning it in this report and no further mitigation is required.		
Cumulative impacts: With the implementation of the mitigation measures in this report the proposed project will have a low cumulative impact on the extensive natural landscape.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

6.7.1 Concluding Statement - Heritage

The Project area is surrounded by agricultural; mining, road and electrical infrastructure developments and the impact area is currently characterised by dense grass cover that limited archaeological visibility.

Nonetheless, the field survey recorded Stone Age artefacts in varying densities (namely R002 a high-density scatter of medium significance and R004 that is isolated and out of context and of no significance apart from mentioning it in this report), a stone cairn (R001) of unknown purpose that although unlikely could indicate a grave, and the ruin of a clay brick dwelling (R003).

The structure's potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance unless associated with burial sites[43]

According to the SAHRA Paleontological sensitivity map the study area is of insignificant to moderate paleontological significance, and an independent study was conducted for this aspect. Bamford (2022) concluded that it is extremely unlikely that any fossils would be preserved in the ancient volcanic rocks or in the sands and soils of the Quaternary but there is a very small chance that fossils may have been transported and deposited in the sands, these fossils would be fragmented and out of context and recommended the implementation of a chance find procedure.

The impact to heritage resources can be mitigated to an acceptable level provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

6.8 VISUAL IMPACTS

Mr Steven Stead of Visual Resource Management Africa (VRMA) undertook a detailed visual impact assessment of the proposed Roan 2 PV. A copy of this assessment is attached in Annexure E8 of the BAR and a summary outcome thereof is provided below.

The visual specialist identified the following impacts that have been assessed in the tables below.

Construction:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

[43] This structure was subsequently excluded from the development footprint.

Operation:

- Massing effect in the landscape from a large-scale modification.
- On-going soil erosion.
- On-going windblown dust.

Decommissioning:

- Movement of vehicles and associated dust.
- Wind-blown dust from the disturbance of cover vegetation / gravel.

Cumulative:

- A long-term change in land use setting a precedent for other similar types of solar energy projects.

6.8.1 Construction Phase Visual Impacts

Table 46: Assessment of Visual Impacts during the construction phase.

Project phase	Construction Phase			
Impact	Short-term landscape change from the current rural agricultural sense of place to the semi-industrial RE landscape.			
Description of impact	• Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure. • Wind-blown dust due to the removal of large areas of vegetation. • Possible soil erosion from temporary roads crossing drainage lines. • Wind-blown litter from the laydown and construction sites.			
Mitigability	High	The mitigation will reduce the significance of the visual and landscape impacts		
Potential mitigation	• Planting of indigenous, endemic thornveld trees along the R505 road in a scattered pattern reflecting natural scattered growth patterns. • Allow nature growth of the trees in the buffer without the trees becoming a fire risk. • Allow cattle access to the buffer areas to keep managing grasslands and retain a link to the rural agricultural sense of place. • Plant rescue of saplings on the site and the re-establishment of these along the road such that they do not shade the panel or create a fire risk.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	Impact will last approximately 8 months.	Short term	Impact will last approximately 8 months.
Extent	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)
Intensity	High	Natural and/ or social functions and/ or processes are strongly altered.	Low	Natural and/ or social functions and/ or processes are somewhat altered.
Probability	Likely	The impact is likely to occur	Likely	The impact is likely to occur.
Confidence	Sure	Substantive supportive data exists to verify the assessment	Sure	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.
Significance	**Medium to High**		**Medium to Low**	

Comment on significance	As the development takes place within the Klerksdorp REDZ, RE landscape change is planned and is likely to become more common in the landscape. While views from Renosterberg hill would have clear views overlooking the PV2 sites, the accommodation area have views to the east and would not be impacted (with mitigation).	.
Cumulatives	**High**	**Medium**
Cumulative impacts	Without mitigation the precedent could negatively influence tourist related resources in the region, undermining the planning emphasis encouraging biodiversity related tourism.	With mitigation, the cumulative risk is minimalised, setting a positive precedence for accommodating tourist related landscapes. As there is a tendency for clustering of renewable energy projects, some risk remains with the attraction of other RE projects in the vicinity.

6.8.2 Operational Phase Visual Impacts

Table 47: Assessment of Visual Impacts during the Operational phase.

Project phase	Operation			
Impact	Long term landscape change from the existing rural agricultural setting to that of a semi-industrial landscape.			
Description of impact	• Massing effect in the landscape from a large-scale modification. • Soil erosion. • Windblown dust.			
Mitigability	Medium to High	The mitigation will reduce the significance of the visual and landscape impacts		
Potential mitigation	• On-going soil erosion prevention. • On-going windblown dust management and the planting of vegetation cover of the impacted areas. • Light spillage management.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last approximately 20 years	Long term	Impact will last approximately 20 years
Extent	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)
Intensity	High	Natural and/ or social functions and/ or processes are strongly altered.	Low	Natural and/ or social functions and/ or processes are somewhat altered.
Probability	Likely	The impact is likely to occur	Likely	The impact is likely to occur.
Confidence	Sure	Substantive supportive data exists to verify the assessment	Sure	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.
Significance	High		Medium	

Comment on significance	The long-term time periods would degrade the local landscape resources used by the Renosterberg Safari accommodation. Un-necessary light spillage intrudes into the current dark sky night-time sense of place.	With mitigation the High Visual Intrusion areas in the front view of the said accommodation are retain as natural/ farming, maintaining the existing sense of place for the accommodation areas. Views of the loss of vegetation will still be visible from higher vantage points on the hill, but these views also include the tailings facility that detract from the sense of place. Light spillage management limits light pollution to acceptable levels.
Cumulatives	High	Medium
Cumulative impacts	Without mitigation the precedent could negatively influence tourist related resources in the region, undermining the planning emphasis encouraging biodiversity related tourism.	With mitigation, the cumulative risk is minimalised, setting a positive precedence for accommodating tourist related landscapes. As there is a tendency for clustering of renewable energy projects, some risk remains with the attraction of other RE projects to the vicinity.

6.8.3 Decommissioning Phase Visual Impacts

Table 48: Assessment of Visual Impacts during the decommissioning phase.

Project phase	Decommissioning Phase			
Impact	Short-term landscape change from the removal of the PV structures, followed by rehabilitation of the impacted areas back to agricultural lands.			
Description of impact	• Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations. • Wind-blown dust from impacts to vegetation. • Wind-blown litter from the laydown and deconstruction sites.			
Mitigability	Medium	The mitigation will reduce the significance of the visual and landscape impacts		
Potential mitigation	• Dust suppression measures. • Litter management measures. • Rehabilitation of impacted areas to agriculturally viable grasslands.			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	Impact will last approximately 8 months.	Short term	Impact will last approximately 8 months.
Extent	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)	Local	Contained within the Foreground/ Mid Ground (approx. 6km from site)
Intensity	Medium	Natural and/ or social functions and/ or processes are moderately altered.	Medium	Natural and/ or social functions and/ or processes are moderately altered.
Probability	Likely	The impact is likely to occur	Likely	The impact is likely to occur.
Confidence	Sure	Substantive supportive data exists to verify the assessment	Sure	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.	Medium	The affected landscape will be able to recover from the impact as there are minimal cut/fills and the thornveld vegetation will regrow over time to some degree.

Significance	Medium	Low
Comment on significance	The dust and vehicle movement impacts are short-term in Duration, and outside the main views of the Renosterberg Safari accommodation.	Visual Intrusion from wind blown dust and from vehicle movement is limited and short-term in Duration.
Cumulatives	Medium (	None
Cumulative impacts	Without rehabilitation, the return of the vegetation to the site and the associated visual impacts would last a longer time period. However, as this is likely to occur naturally, the cumulative risk is limited.	Effective management of rehabilitation can result in the return of the landscape to that of a functional agricultural area.

6.8.4 Concluding Statement – Visual

The visual specialist has reccomended that the proposed development should be authorised with mitigation for the following key reasons:

- Alignment with National REDZ and local planning related to energy and job creation.
- Moderated ZVI that does include mining related landforms that do detract from the local sense of place to some degree.
- Receptors sensitive to landscape change are likely to be limited but do include the Renosterberg Safari & Farm who have expressed concern regarding the location of the PV in from on their eco-tourism accommodation.

Mitigation required to ensure that the landscape change remains congruent with the rural agricultural landscape character:

- Retaining the southern portion in from the Renosterberg Safari accommodation as a No-go area.
- Retain a 100m buffer from the tarred roads where existing Thornveld trees are retained and encouraged to grow but fenced in such a manner as to allow cattle access to the buffer strips for grazing and grass management purposed. This would need to be managed such that this area does not become a fire risk to the project.

6.9 AQUATIC BIODIVERSITY IMPACTS

An Aquatic Biodiversity Impact Assessment was undertaken by Anthene Ecological CC and is attached in Annexure E2. The following section has been summarised from this study.

The specialist identified the following potential impacts that are assessed in the tables below.

Construction Phase

- Loss of riparian habitat owing to the removal of vegetation at the proposed footprint for development.
- Changes in flow regime.
- Exposure of soil leading to soil compaction and/ or erosion.
- Loss of sensitive wetland/ riparian species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Loss of riparian connectivity and conservation corridor networks in the landscape.
- Contamination of riparian soil during construction in particular by hydrocarbon spills.
- Contamination of habitat by littering and dumping of rubble/ construction material.
-

Operational Phase

- An increased infestation of exotic or alien invasive plant species owing to disturbances associated with the proposed development.

- Poor recovery of soils that were exposed and compacted during the construction phase.

6.9.1 Construction Phase Aquatic Biodiversity Impacts.

The specialist undertook the assessment in accordance with the requirements of the published General Notice (GN) 509 by the Department of Water and Sanitation (DWS). This notice was published in the Government Gazette (no. 40229) under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016, for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 509 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application (WULA). A water use (or potential) qualifies for a GA under GN 509 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM). These are summarised in the tables below.

Table 49: Assessment of potential risks on the non perennial during construction[44].

Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating
Clearing of vegetation at proposed footprint in preparation for construction and during construction.	1	1	5	1	8	24	**Low**
Moving vehicles and working of machinery and equipment at bridge crossings and extra strip for manoeuvring.	1	1	5	1	8	24	**Low**
Vehicles and machinery could leak which then result in spilling of hydrocarbons.	1	1	5	2	8	24	**Low**
Waste or building rubble are generated during the construction phase.	1	1	5	1	8	24	**Low**
Creating access road(s) to construction area.	1	1	5	1	8	24	**Low**

Table 50: Assessment of potential risks on the non perennial watercourse during construction[45].

[44] It must again be noted that this non perennial watercourse was specifically excluded completely from the preferred layout alternative (along with the buffers proposed by the specialist.

[45] It must again be noted that this non perennial watercourse was specifically excluded completely from the preferred layout alternative (along with the buffers proposed by the specialist.

Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating
Clearing of vegetation at proposed footprint in preparation for construction and during construction.	1	2	5	1	9	40,5	**Low**
Moving vehicles and working of machinery and equipment at bridge crossings and extra strip for manoeuvring.	4	2	5	1	12	54	**Low**
Vehicles and machinery could leak which then result in spilling of hydrocarbons.	2	1	5	2	12	54	**Low**
Waste or building rubble are generated during the construction phase.	3	2	5	1	11	55	**Low**
Creating access road(s) to construction area.	1	1	5	1	8	24	**Low**

6.9.2 Operation Phase Aquatic Biodiversity Impacts

Table 51: Assessment of potential risks on the watercourses during operations[46].

Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating
Cleared areas where alien invasive plant species establish.	1	1	5	2	11	36	**Low**
Compacted and exposed soils do not recover easily without rehabilitation.	1	1	5	2	11	34	**Low**

Table 52: Assessment of potential risks on the non perennial watercourse during construction[47].

Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating
Cleared areas where alien	2	2	5	2	11	49,5	**Low**

[46] It must again be noted that this non perennial was specifically excluded completely from the preferred layout alternative (along with the buffers proposed by the specialist).

[47] It must again be noted that this non perennial watercourse was specifically excluded completely from the preferred layout alternative (along with the buffers proposed by the specialist.

invasive plant species establish.							
Compacted and exposed soils do not recover easily without rehabilitation.	2	2	5	2	11	49,5	**Low**

6.9.3 Concluding Statement – Aquatic Biodiversity.

Wetlands that could be classified as Floodplain Wetlands, Channelled Valley-bottom Wetlands, Unchannelled Valley-bottom Wetlands, Depressions (Pans), Seeps or Wetland Flats appear to be absent at the site.

Two non-perennial rivers (of which the active channel of one is poorly defined at places) are identified at the site. A narrow non-perennial river, with its active channel and riparian zone, is present at the northwestern part of the site. An in-channel dam (Dam 1), is present at the northeastern part of the site. Another poorly defined active channel and riparian zone is present at the central part of the site. There is a very small dam (Dam 2) at this poorly defined active channel.

Vegetation at the riparian zone and along the fringes of the in-channel dam (Dam 1) at the western part of the site includes the trees Vachellia karroo and Searsia pyroides. Shrubs such as Asparagus laricinus and the herbaceous shrub Gomphocarpus fruticosus are conspicuous near and at the riparian zone. The indigenous herbaceous plant species Berkheya radula and the alien invasive Cirsium vulgare are found at the outer edges of the riparian zone. Sedge species such as Cyperus longus and Eleocharis limosa, with the grass species Echinochloa holubii and herbaceous Persicaria species are present at the more permanently inundated soils at the riparian zone. The alien invasive grass species Paspalum dilatatum as well as the alien invasive herbaceous species Oenothera rosea and Rumex crispus occur at the riparian zone and edges of the in-channel dam as well.

The riparian vegetation along the poorly defined active channel at the central part of the site is also poorly defined in many areas. Few trees or shrubs are present at this riparian zone. This area appears to be trampled or eroded. The succulents Chasmatophyllum muscilinum and Ruschia canonotata (terrestrial species) are present at some of these bare areas with the karoo element Pentzia globosa (terrestrial species). The sedge Kyllinga erecta is in particular conspicuous at wet areas along the riparian zone. The graminoids Echinochloa holubii, Eleocharis limosa and Kyllinga erecta are visible at the periphery of this small dam (Dam 2).

Present ecological status (PES) of the Non-perennial River (with Dam 1) at the site is CATEGORY C which means the watercourse is moderately modified but with some loss of natural habitats. Ecological Importance and Sensitivity (EIS) of the non-perennial river (with Dam 1) at the site is Category C which is Moderate and refers to watercourses that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.

Present ecological status (PES) of the Non-perennial River (with Dam 2) at the site is CATEGORY C which means the watercourse is moderately modified but with some loss of natural habitats. Ecological Importance and Sensitivity (EIS) of the non-perennial river (with Dam 2) at the site is Category C which is Moderate and refers to watercourses that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.

Site is part of the Middle Vaal Water Management Area (WMA 9). The site is not part of a Freshwater Ecosystem Priority Area (FEPA) or wetland cluster (Nel et al., 2011a, 2011b).

The non-perennial rivers at the site, with small in-channel dams and with their riparian zones and buffer zones, are likely to be impacted by the proposed developments, but to a very limited extent. Apart from existing roads for access, these watercourses are excluded from the development. If the development is approved the construction should be planned in such a manner that surface flow function well while erosion is limited. There is no distinct indication that interflow plays an important role in the maintenance of the non-perennial river. The geomorphological setting and flow regime should be as similar as possible post development as to prior the development, if the development is approved (in this case there could be some positive impact on the flow regime). Loss of any wetland animal or plant species of particular conservation importance is not expected.

Loss of wetland Threatened or Near Threatened Plants, Mammals, Reptiles, Amphibians and Invertebrates at the proposed footprint appears to be unlikely.

Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils and also impact on water quality when the stream flows. Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.

A rehabilitation plan which include the combating of alien invasive plant species at the watercourse is essential. Infestation by alien invasive species could replace indigenous vegetation or potential areas where indigenous vegetation could recover. Once established combatting these alien invasive plant species may become very expensive to combat in the long term, especially if species such as Prosopis (Mesquite) and Melia azedarach (Syringa Berry-tree) is allowed to establish. Continued monitoring and eradication of alien invasive plant species are imperative.

The Negative Risk Rating in accordance with a risk matrix based on Section 21 c and (i) water use Risk Assessment Protocol and Notice 509 of 2016 (Government Gazette No. 40229: 105-133; Republic of South Africa) at the site is Low and as such it can be considered under General Authorisation.

6.10 SOCIAL IMPACTS

Savannah Environmental undertook a Social Impact Assessment of the proposed Roan 2 PV. A copy of this assessment is included in **Annexure E8,** and the following summary is provided in this regard.

6.10.1 Assessment of social impacts associated with the construction phase

The Social Specialist identified the following impacts that are assessed in the table below.

- Direct and indirect employment opportunities
- Economic multiplier effects
- Influx of jobseekers and change in population
- Safety and security impacts
- Impacts on daily living and movement patterns
- Nuisance impacts, including noise and dust
- Visual impacts and sense of place impacts

Table 53: Assessment of positive social impacts during the construction phase

Nature: The creation of direct and indirect employment opportunities during the construction phase of the project.		
	Without mitigation	**With mitigation**
Extent	Local - Regional	Local - Regional
Duration	Short term	Short term
Magnitude	Minor	Moderate
Probability	Highly Probable	Definite
Significance	**Low**	**Medium**

Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- To enhance the local employment, skills development and business opportunities associated with the construction phase the following measures should be implemented:
- It is recommended that local employment policy is adopted to maximise the opportunities made available to the local labour force. AMDA November (Pty) Ltd should make it a requirement for contractors to implement a 'locals first' policy, especially for semi and low skilled job categories. Enhance employment opportunities for the immediate local area Matlosana Local Municipality, if this is not possible, then the broader focus areas should be considered for sourcing workers.
- In the recruitment selection process; consideration must be given to women during recruitment process
- It is recommended to set realistic local recruitment targets for the construction phase
- Training and skills development programmes should be initiated prior to the commencement of the construction phase

Cumulative impacts:

Opportunity to upgrade and improve skills levels in the area

Residual Risks:

- Improved pool of skills and experience in the local area
- Temporary employment during the construction phase will result in job losses and struggles for construction workers to find new employment opportunities following the completion of construction.
- Economic growth for small-scale entrepreneurs

Nature: Significance of the impact from the economic multiplier effects from the use of local goods and services.

	Without mitigation	**With mitigation**
Extent	Local - Regional	Local - Regional
Duration	Short term	Short term
Magnitude	Low	Moderate
Probability	Highly Probable	Definite
Significance	**Medium**	**Medium**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- A local procurement policy should be adopted to maximise the benefit to the local economy and the existing local SMMEs.
- A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project-related work where applicable.
- Local procurement must be encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible.

Cumulative impacts:

Opportunity for local capital expenditure, potential for the local service sector

Residual Risks:

Improved local service sector; growth in local business

Nature: In-migration of labourers in search of employment opportunities, and a resultant change in population, and increase in pressure on local resources and social networks, or existing services and infrastructure.

	Without mitigation	**With mitigation**
Extent	Local	Local
Duration	Short term	Short term
Magnitude	Moderate	Low
Probability	Improbable	Improbable

Significance	**Low**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- Develop and implement a recruitment protocol in consultation with the municipality and local community leaders. Ensure that the procedures for applications for employment are clearly communicated.
- Develop and implement a local procurement policy which prioritises "locals first" to prevent the movement of people into the area in search of work.
- Engage with local community representatives prior to construction to facilitate the adoption of the local's first procurement policy.
- Provide transportation for workers to ensure workers can easily access their place of employment and do not need to move closer to the project site.
- Compile and implement a grievance mechanism.
- Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour.
- Prevent the recruitment of workers at the construction site.
- Implement a method of communication whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.
- Establish clear rules and regulations for access to the construction site.
- Appoint a security company and implement appropriate security procedures to ensure that workers to not remain on site after working hours.
- Inform local community organisations and policing forums of construction activities and times and the duration of the construction phase.

Cumulative impacts:
Possible increase in crime level (with influx of people) with subsequent possible economic losses,

Residual Risks:
Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure, resources and services

Nature: Temporary increase in safety and security concerns associated with the influx of people during the construction phase.
.

	Without mitigation	**With mitigation**
Extent	Local	Local
Duration	Short term	Short term
Magnitude	High	Moderate
Probability	Probable	Improbable
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- Working hours must preferably be restricted to daylight hours during the construction phase. Where deviation of working hours is required, it must be approved by the relevant local authorities and surrounding landowners must be notified.
- All vehicles must be road worthy, and drivers must be licensed, obey traffic rules, follow speed limits and made aware of the potential road safety issues.
- Construction vehicles should be inspected regularly by the EPC contractor to ensure their road worthiness.
- Adequate and strategically placed traffic warning signs and control measures must be placed along the gravel farm access roads to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be visible at all times, and especially at night and must be maintained throughout the construction phase.
- Implement penalties for reckless driving as a way to enforce compliance to traffic rules.
- Avoid heavy vehicle activity through residential areas during "peak" hours (when children are taken to school, people driving to work, etc.).
- The developer and EPC contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed or damaged due to construction activities.

• The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if damaged (i.e. wear and tear) due to construction activities. • A protocol for communication must be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. • Undertake information sessions with the surrounding communities, and affected and adjacent landowners, prior to construction in order to ensure that communities are fully informed of the project to be developed in its final form. This must be undertaken through the appointment of a CLO.
Cumulative impacts: Possible increase in crime level (with influx of people) with subsequent possible economic losses
Residual Risks: None anticipated.

Nature: Temporary increase in traffic disruptions and movement patterns during the construction phase.		
	Without mitigation	**With mitigation**
Extent	Local – Regional	Local – regional
Duration	Short term	Short term
Magnitude	High	Moderate
Probability	Probable	Probable
Significance	**Medium**	**Medium**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation: • Working hours must preferably be restricted to daylight hours during the construction phase. Where deviation of working hours is required, it must be approved by the relevant local authorities and surrounding landowners must be notified. • All vehicles must be road worthy, and drivers must be licensed, obey traffic rules, follow speed limits and made aware of the potential road safety issues. • Construction vehicles should be inspected regularly by the EPC contractor to ensure their road worthiness. • Adequate and strategically placed traffic warning signs and control measures must be placed along the gravel farm access roads to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be visible at all times, and especially at night and must be maintained throughout the construction phase. • Implement penalties for reckless driving as a way to enforce compliance to traffic rules. • Avoid heavy vehicle activity through residential areas during "peak" hours (when children are taken to school, people driving to work, etc.). • The developer and EPC contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed or damaged due to construction activities. • The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if damaged (i.e. wear and tear) due to construction activities. • A protocol for communication must be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process. • Undertake information sessions with the surrounding communities, and affected and adjacent landowners, prior to construction to ensure that communities are fully informed of the project to be developed in its final form. This must be undertaken through the appointment of a CLO. • The placement of the power line route within the grid connection corridor must avoid the sensitive land uses undertaken by the affected landowners as far as possible. Consultation with the affected landowners must be undertaken in this regard.		
Cumulative impacts: Possible increase in crime level (with influx of people) with subsequent possible economic losses,		
Residual Risks: None anticipated		

Nature: Nuisance impacts in terms of temporary increase in noise and dust.		
	Without mitigation	**With mitigation**
Extent	Local	Local

Duration	Short term	Short term
Magnitude	High	Moderate
Probability	Highly probable	Probable
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- The movement of heavy vehicles associated with the construction phase through populated areas should be timed to avoid weekends, public holidays and holiday periods, where feasible.
- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.
- A speed limit of 40km/hr should be implemented on gravel roads.
- Ensure all vehicles are road worthy, drivers are licensed and are made aware of the potential noise and dust issues.
- A CLO should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.
- A stakeholder management plan must be implemented by the EPC contractor to address neighbouring farmer concerns regarding safety and security.

Cumulative impacts:
Other construction activities in area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads.

Residual Risks:
None anticipated

Nature: Intrusion impacts from construction activities will have an impact on the area's "sense of place".		
	Without mitigation	**With mitigation**
Extent	Local	Local
Duration	Short term	Short term
Magnitude	Low	Low
Probability	Highly probable	Probable
Significance	**Low**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- Limit noise generating activities to daylight working hours and avoid weekends and public holidays.
- The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible.
- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads 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 licensed and made aware of the potential road safety issues and need for strict speed limits.
- Communication, complaints and grievance channels must be implemented and contact details of the CLO must be provided to the relevant local communities.
- Ensure proper management and tidiness of the construction site.
- Implement the relevant mitigation measures as recommended in the Visual Impact Assessment.

Cumulative impacts:
The primary visual impact, namely the layout and appearance of the PV panels is not possible to mitigate.

Residual Risks:
None anticipated

6.10.2 Assessment of social Impacts Associated with the operational phase.

The social specialist identified both positive and negative impacts associated with the operational phase of the development, these impacts were identified as follows:

- Direct and indirect employment opportunities
- Development of non-polluting, renewable energy infrastructure
- Contribution to Local Economic Development (LED) and social upliftment
- Visual and sense of place impacts
- Impacts associated with the loss of agricultural land

.

An assessment of both these positive and negative impacts are included in the tables below.

Table 54: Assessment of social impacts during the operational phase.

Nature: The creation of employment opportunities and skills development opportunities during the operation phase.		
	Without mitigation	**With mitigation**
Extent	Local-Regional	Local-regional
Duration	Long-term	Long-term
Magnitude	Low	Low
Probability	Highly probable	Definite
Significance	**Medium**	**Medium**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
• ***Mitigation:*** • It is recommended that a local employment policy is adopted by the developer to maximise the project opportunities being made available to the local community. Enhance employment opportunities for the immediate local area, City of Matlosana Local Municipality, if this is not possible, then the broader focus areas should be considered for sourcing employees. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible • The developer should establish vocational training programs for the local employees to promote the development of skills.		
Cumulative impacts: Opportunity to upgrade and improve skills levels in the area		
Residual Risks: Improved pool of skills and experience in the local area		

Nature: Renewable energy as an alternative		
	Without mitigation	**With mitigation**
Extent	Local-Regional	Local-Regional-National
Duration	Long-term	Long-term
Magnitude	Minor	Minor
Probability	Definite	Definite
Significance	**Medium**	**Medium**
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	No	
Mitigation: None identified.		
Cumulative impacts: None		
Residual Risks: Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming		

Nature: Local upliftment and contribution to the economy .		
	Without mitigation	**With mitigation**
Extent	Local-Regional- National	Local-Regional-National
Duration	Long-term	Long-term
Magnitude	Moderate	High
Probability	Highly probable	Highly probable
Significance	**Medium**	**Medium**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation: • A CNA must be conducted to ensure that the LED and social upliftment programmes proposed by the project are meaningful. • Ongoing communication and reporting are required to ensure that maximum benefit is obtained from the programmes identified, and to prevent the possibility for such programmes to be misused. • The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs of the community at the time (bearing in mind that these are likely to change over time).		
Cumulative impacts: None		
Residual Risks: Social upliftment of the local communities through the development and operation of the project.		

Nature: Visual impacts and sense of place impacts associated with the operation phase of the visual PV Facility.		
	Without mitigation	**With mitigation**
Extent	Local	Local
Duration	Long-term	Long-term
Magnitude	Low	Minor
Probability	Highly Probable	Probable
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation: • Maintain and manage the associated infrastructure to be in a good and neat condition to ensure that no degradation of the area and the associated infrastructure servitude takes place and impacts the visual quality of the area. • Implement the relevant mitigation measures as recommended in the Visual Impact Assessment.		
Cumulative impacts: Vegetation screening established if required		
Residual Risks: The visual impact of the PV facility will remain until the infrastructure is completely decommissioned and removed. Thereafter the impact will be removed.		

Nature: Loss of agricultural land and overall productivity because of the operation of the proposed project on an agricultural property.		
	Without mitigation	**With mitigation**
Extent	Local	Local-regional
Duration	Long-term	Long-term
Magnitude	Moderate	Low
Probability	Probable	Improbable
Significance	**Medium Negative**	**Medium Negative**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be mitigated?	Yes
Mitigation: Keep the project footprint as small as possible. Avoid interference with current agricultural activities undertaken within the affected properties.	
Cumulative impacts: Vegetation screening established if required	
Residual Risks: None expected to occur.	

6.10.3 Concluding Statement - Social

The social specialist has confirmed that the proposed project is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the report and the potential for mitigation and management of impacts, it is the reasoned opinion of the specialist that the project can be authorised from a social perspective.

6.11 TRAFFIC IMPACTS

JG Afrika undertook a Traffic Impact Assessment of the proposed Roan 2 PV. A copy of this assessment is included in **Annexure E13,** and the following summary is provided in this regard.

6.11.1 Construction Phase Traffic Impacts

Table 55: Assessment of Construction Phase Traffic Impacts

Nature: Transport of equipment, material and staff to site that leads to traffic congestion.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Low
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No loss	No Loss
Reversibility	Completely reversible	
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Traffic on roads will generate dust.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor

Probability	Highly probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	Completely reversible
Mitigation:	See section 7 for required mitigation measures.	

Nature: Noise pollution due to increased traffic.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	
Mitigation:	See section 7 for required mitigation measures.	

6.11.2 Operational Phase Traffic Impacts

The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.

6.11.3 Decommissioning Phase Traffic Impacts

Table 56: Assessment of Decommissioning Phase Traffic Impacts

Nature: Transport of equipment, material and staff to site that leads to traffic congestion.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Low
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No loss	No Loss
Reversibility	Completely reversible	Completely reversible

Can impact be mitigated	Yes
Mitigation:	See section 7 for required mitigation measures.

Nature: Traffic on roads will generate dust.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	Completely reversible
Mitigation:	See section 7 for required mitigation measures.	

Nature: Noise pollution due to increased traffic.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	
Mitigation:	See section 7 for required mitigation measures.	

6.11.4 Cumulative Traffic Impacts

Table 57: Assessment of Cumulative Traffic Impacts

Nature: Traffic generated by the proposed development and the associated noise and dust pollution		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent / Spatial Scope	Low	Moderate
Duration	Very Short	Short
Magnitude / Severity	Moderate	Moderate

Probability	Highly probable	Definite
Significance	Medium	Medium
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No	No
Reversibility	reversible	reversible
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.11.5 Concluding Statement – Traffic

The construction and decommissioning phases of a development is the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is short term i.e. the impact of the traffic on the surrounding road network is temporary and solar farm, when operational, does not add any significant traffic to the road network.

The proposed access point and the access road to the facility are deemed feasible from a traffic engineering perspective.

The impacts associated with the proposed Roan 2 PV Facility are acceptable with the implementation of the recommended mitigation measures and can therefore be authorised.

6.12 CUMULATIVE IMPACT ASSESSMENT

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."

A Strategic Environmental Assessment process was undertaken by the CSIR in order to identify geographical areas most suitable for the rollout of Renewable Energy projects and the supporting electricity grid network. The aim of the assessment was to designate REDZs within which such development will be incentivised and streamlined. Subsequent to the SEA, these REDZ have been gazetted. Roan 2 PV is within one of these Gazetted REDZ and as such deemed more suitable for such development on a cumulative scale.

Cumulative impacts that could occur due to the development of solar energy facilities and associated infrastructure in close proximity to each other include impacts such as:

- Visual impacts
- Socio-economic impacts
- Loss of vegetation and the inability to achieve conservation targets
- Impacts to soil and agricultural potential
- Impacts on heritage resources (in this area particularly relating to Archaeology resources)
- Surface water resources

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

- Cumulative impacts due to the cumulative effects of Roan 2 PV added to all other renewable energy facilities in the Hartebeesfontein Area. These impacts 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 Solar Facilities proposed to be co-located in close proximity to oneanother (i.e Roan 2 PV and Roan 2 PV).

According the DFFE Database of renewable energy facilities, there are no renewable energy facilities within 30km of Roan 2 PV [48]..

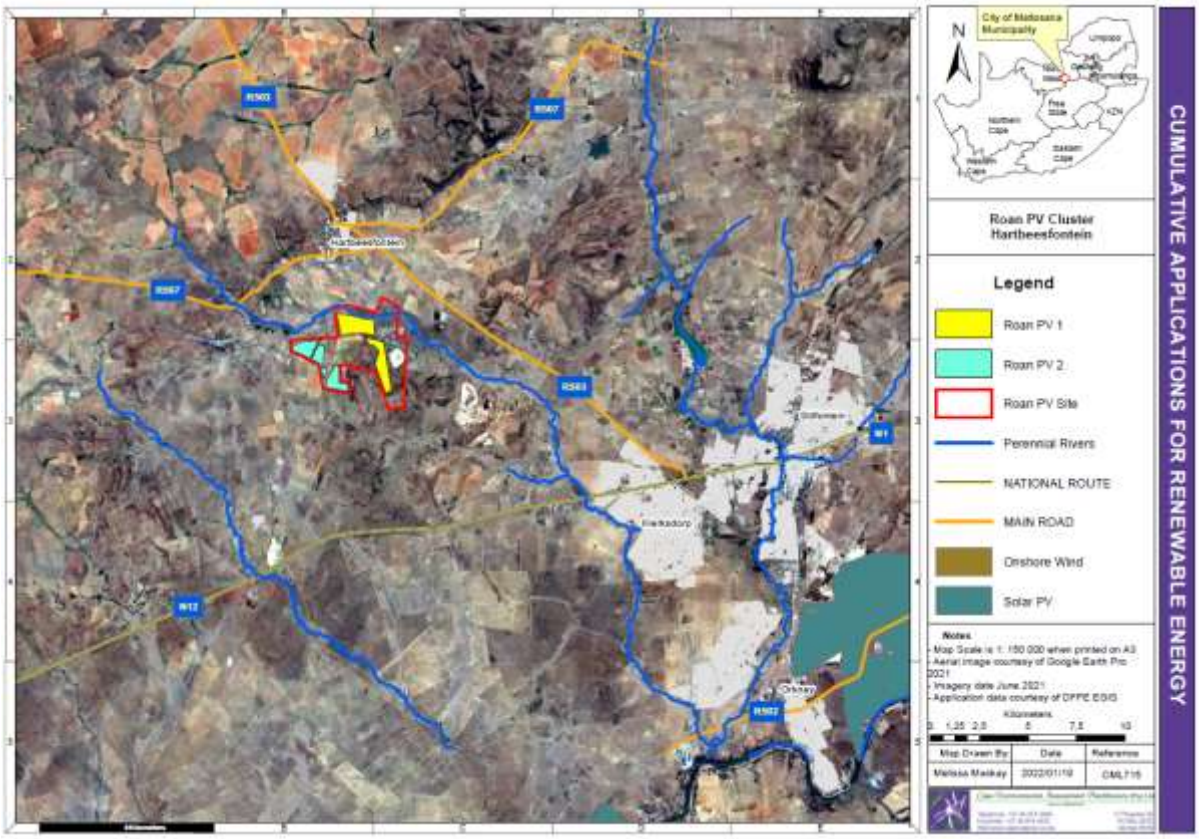

Figure 66: Renewable Energy Facilities within proximity of Portions 4,5,9 and 16 of the farm 299.

Based on the two current studies underway, one can expect the cumulative transformation of approximately 440 hectares of the two vegetation types present (i.e. Klerksdorp Thornveld and Vaal Vet Sandy Grassland).

Table 58: Potential habitat transformation proximity to Roan 2 PV.

Status	Transformation Area in Hectares
In operation	0
Under construction	0
Authorised	0
EIA in Progress	440

[48] Excluding those currently proposed as part of the Roan PV Cluster (i.e Roan 1 PV and Roan 2 PV).

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 cumulative transformation of 440 hectares (based on the currently available information).

It is important to note that the projects in the area affect both the Klerksdorp Thornveld Vegetation type as well as the Vaal Vet Sandy Grassland Vegetation Tup and as such the cumulative impact in the landscape will not be limited to a single habitat type.

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.

From a social perspective the project is deemed to have a high positive cumulative impact from employment, skills and business opportunities and skills development and a low negative cumulative impact on sense of place and Local Services and accommodation.

From a visual perspective the long-term change in land use setting a precedent for other similar types of solar energy projects, has a moderate cumulative impact.

6.13 IMPACT SUMMARY

The table below summarises the significance (with mitigation) of all impacts assessed in the sections above[49].

For ease of easy references, impacts are visually reflected using the following colour scheme[50].

All positive impacts (regardless of their significance)

Neutral or Negligible negative impacts

Very Low and Low negative impacts

Moderate and Moderate – High negative impacts

High and Very High negative impacts

Table 59: Summary of the significance of impacts associated with Roan 2 PV [51].

Impact	Significance / Status
Construction Phase Terrestrial Biodiversity Impacts	
Loss of habitat owing to the removal of vegetation at the proposed development.	Moderate Negative
Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.	Low Negative
Loss of connectivity and conservation corridor networks in the landscape.	Low Negative
Contamination of soil during construction in particular by hydrocarbon spills.	Low Negative
Killing of vertebrate fauna during the construction phase.	Low Negative
Operational Phase Terrestrial Biodiversity Impacts	
An increased infestation of exotic or alien invasive plant species owing to clearance or disturbance where the footprint took place.	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts	
Loss of habitat owing to the removal of vegetation at the proposed development.	Moderate Negative

[49] In order to attain these outcomes, the mitigation measures reflected in section 7 of the report need to be implemented.

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

[51] This includes cumulative impacts associated with the facility

Impact	Significance / Status
Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the decommissioning phase.	Low Negative
Loss of connectivity and conservation corridor networks in the landscape.	Low Negative
Contamination of soil during construction in particular by hydrocarbon spills.	Low Negative
Killing of vertebrate fauna during the decommissioning phase.	Low Negative
Agricultural Impacts – all phases.	
Loss of agricultural potential by occupation of land	Low Negative
Loss of agricultural potential by soil degradation	Low Negative
Dust impact	Low Negative
Enhanced agricultural potential through increased financial security for farming operations (positive impact)	Low Positive
Visual Impacts during the construction phase	
Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.	Medium – Low Negative
Wind-blown dust due to the removal of large areas of vegetation.	Medium - Low Negative
Possible soil erosion from temporary roads crossing drainage lines.	Medium – Low Negative
Wind-blown litter from the laydown and construction sites.	Medium – Low negative
Visual Impacts during the operational phase	
Massing effect in the landscape from a large-scale modification.	Medium - Low Negative
Soil erosion.	Medium Negative
Windblown dust	Medium Negative
Visual Impacts during the decommissioning phase	
Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations.	Low Negative
Wind-blown dust from impacts to vegetation	Low Negative
Wind-blown litter from the laydown and deconstruction sites	Low Negative
Construction Phase Aquatic Risks	
Clearing of vegetation at proposed footprint in preparation for construction and during construction.	Low Negative
Moving vehicles and working of machinery and equipment at bridge crossings and extra strip for manoeuvring.	Low Negative
Vehicles and machinery could leak which then result in spilling of hydrocarbons	Low Negative
Waste or building rubble are generated during the construction phase.	Low Negative
Creating access road(s) to construction area.	Low Negative
Operational Phase Aquatic Risks	
Cleared areas where alien invasive plant species establish..	Low Negative
Compacted and exposed soils do not recover easily without rehabilitation	Low Negative
Construction Phase Social Impacts	
Direct and indirect employment opportunities	Medium Positive
Economic multiplier effects	Medium Positive
Influx of jobseekers and change in population	Low Negative
Safety and security impacts	Low Negative
Impacts on daily living and movement patterns	Medium Negative
Nuisance impacts, including noise and dust	Low Negative
Visual impacts and sense of place impacts	Low Negative
Operational Phase Social Impacts	
Direct and indirect employment opportunities	Medium Positive
Development of non-polluting, renewable energy infrastructure	Medium Positive
Contribution to Local Economic Development (LED) and social upliftment	Medium Positive
Visual and sense of place impacts	Low Negative
Impacts associated with the loss of agricultural land	Low Negative
Construction Phase Avifaunal Impacts.	
Displacement of priority species due to disturbance and habitat transformation associated with construction of the PV plant and associated infrastructure	High
Operational Phase Avifaunal Impacts.	
Mortality of priority species due to collisions with solar panels	Very Low Negative
Entrapment of birds in the perimeter fence	Low Negative

Impact	Significance / Status
Mortality of priority species due to electrocution in the onsite substations	Low Negative
Mortality of priority species due to collisions with the 132kV OHL	Low Negative
Decommissioning Phase Avifaunal Impacts.	
Displacement of priority species due to disturbance associated with decommissioning of the PV plant and associated infrastructure.	Medium Negative
Construction Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust	Low
Noise pollution due to increased traffic	Low
Operational Phase Traffic Impacts.	
The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.	Absent
Decomissioning Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust.	Low
Noise pollution due to increased traffic.	Low
Impacts on identified Heritage Features	
Impact on the Stone cairn - R001	Low
Impact on the Stone Age site RB002.	Low
Impact on the dwelling ruin at R003	Low
Impact the Stone Age scatter RB004	Low

6.14 IMPACT STATEMENT

The majority of impacts range from high positive to medium negative with the exception of a single high impact associated with the potential displacement of an avifaunal species of conservation concern. The avifaunal specialist did however confirm that the habitat on site is marginal for this species and confirmed the risk not to constitute a fatal flaw.

All high, very high and critical negative impacts have been avoided by the avoidance of sensitive features or have been mitigated to acceptable levels via the risk adverse approach to the development outlined in section 2.23 and 2.24 of this report.

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 1) avoids the main sensitive features, (most notably, non perennial rivers (with associated in stream dams), Ridges, avifaunal buffers, stormwater management areas and the viewshed from the existing Renosterberg Safari main accommodation).

The affected area is therefore considered suitable for development and there are no impacts associated with Roan 2 PV that cannot be mitigated to an acceptable level. With the enhancement measures suggested by the Social Specialist, high positive impacts on Creation of employment and business opportunities, Economic Multiplier effects, Generation income for affected landowner and Cumulative impact on local economies can be expected.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the preferred alternative in this assessment (Layout Alternative 1), Roan 2 PV and its associated short grid connections can be supported from a terrestrial biodiversity, Aquatic biodiversity, avifaunal, visual, social, heritage (inclusive of Archaeology, Cultural Landscape and Palaeontology), 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..

Please refer to the table in the section above listing the key impacts and their significance post mitigation for the preferred alternative. This section must be read in conjunction with the suggested mitigation measures listed in section 7 of this Report.

The table below shows the listed activities applied for with a reference of where the impacts associated with the specific activity are assessed by specialists.

Table 60: Specialist Impact Assessment of Listed Activities.

Activity No(s):	Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Specialist Assessment
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;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
12	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Appendix E1 and E2
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;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
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;	Appendices E6, E8 and E9
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;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
Activity No(s):	**Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	
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,	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. North West ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
12	The clearance of an area of 300 square metres or more of indigenous vegetation.	Appendices E1, E2, E3, E4, E5, E6, E7 and E8

	i. North West ii. Within critical biodiversity areas identified in bioregional plans;	
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. North West ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8

7. MITIGATION MEASURES

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 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 such.

Table 61: Recommended mitigation measures required for the construction, operation and decommissioning of the Roan 2 PV development.

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
Aquatic Biodiversity					
Design and implement an effective stormwater management plan.	✓		✓	✓	
Promote water infiltration into the ground beneath the solar panels		✓	✓	✓	
Release only clean water into the environment.		✓	✓		
Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g., slabs of concrete with rocks cemented in).		✓	✓	✓	
Re-vegetate denuded areas as soon as possible.		✓	✓		
Regularly clear drains.		✓		✓	
Minimise the extent of concreted / paved / gravel areas		✓	✓	✓	
A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving		✓	✓		
Avoid excessively compacting the ground beneath the solar panels.		✓	✓		

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

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
Where possible minimise the use surfactants to clean solar panels and herbicides to control vegetation beneath the panels. If surfactants and herbicides must be used do so well prior to any significant predicted rainfall events.		✓		✓	
Promptly remove / control all alien and invasive plant species that may emerge during construction (i.e., weedy annuals and other alien forbs) must be removed.		✓	✓	✓	
Develop and implement a rehabilitation and closure plan	✓				✓
Appropriately rehabilitate the development area by ripping, landscaping and re-vegetating with locally indigenous species					✓
Terrestrial Biodiversity					
A comprehensive stormwater management plan must be developed.	Already forms part of this environmental process		✓	✓	
A vegetation alien invasive management plan should be implemented. This plan must be implemented during the construction phase of the project and continue for the life of the project. This plan must be adapted based on changing site conditions	✓		✓	✓	
A fire management plan needs to be compiled and implemented;		✓	✓	✓	
An adaptive rehabilitation plan needs to be implemented from the onset of the project. This must be compiled with input from independent ecological specialists;	✓		✓	✓	
A competent Environmental Control Officer (ECO) must oversee the construction and rehabilitation phase of the project, with watercourse adjacent areas as a priority;	✓		✓		✓
An infrastructure monitoring and service plan must be compiled and implemented during the operational phase. This will include the monitoring of all stormwater discharge points and energy dissipation structures in the development area	✓		✓	✓	
An annual monitoring programme of the floodplain and downstream habitat is recommended to establish trends and monitor the impacts of the proposed project for a period of one year post construction.	✓		✓	✓	
Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g., concrete) in such a way as to prevent them leaking and entering the environment		✓	✓	✓	✓
Mixing of concrete must under no circumstances take place within the drainage lines. No batching		✓	✓	✓	✓

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
may be allowed on the bare ground, it must be ready-mix or batched on batching plates.					
The water resources outside of the specific development area must be avoided;	✓		✓		
Laydown yards, camps and storage areas must be beyond the watercourse areas. Where possible, the construction of the crossings must take place from the existing road and not from within the drainage line;		✓	✓	✓	
The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly		✓	✓	✓	✓
Prevent uncontrolled access of vehicles through the watercourse that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas		✓	✓		✓
All chemicals and toxicants to be used for the construction must be stored outside the watercourses and in a bunded area within the site camp. Mobile refuelling must be done over a drip tray beyond of all watercourse and buffer areas		✓	✓	✓	✓
All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site		✓	✓	✓	✓
All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;		✓	✓		
Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the development area. These should not be placed near any water course or in buffer zones. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);		✓	✓		
Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the watercourses		✓	✓	✓	
All removed soil and material must not be stockpiled within the watercourses. Stockpiling should take place outside of watercourses. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds		✓	✓		
Erosion and sedimentation into the drainage lines must be minimised through the effective stabilisation in compliance with the stormwater and erosion management plan (e.g., gabions and Reno		✓	✓		

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
mattresses) and the re-vegetation of any disturbed areas					
Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses that are drought tolerant) to protect the exposed soil		✓	✓		
No dumping of construction material on-site may take place		✓	✓		
All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported		✓	✓		
Make sure all excess consumables and building materials / rubble are removed from site and deposited at an appropriate waste facility		✓	✓		
Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential		✓	✓	✓	
Visual					
The viewshed from the Renosterfontein Safari must be excluded from the development footprint[53]	✓		✓		
Following the removal of the vegetation, wind blown dust during construction should be monitored by the ECO to ensure that it does not become a nuisance factor to the local receptors. Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the ECO		✓	✓		
Topsoil from the footprints of the road and structures should be dealt with in accordance with EMP.		✓	✓		
All proposed buildings should be painted a grey-brown colour		✓	✓		
Fencing should be simple, diamond shaped (to catch wind-blown litter) and appear transparent from a distance. The fences should be checked on a monthly basis for the collection of litter caught on the fence		✓	✓		
Signage on the R61 should be moderated		✓	✓		
Lights at night have the potential to significantly increase the visual exposure of the proposed project. It is recommended that mitigations be implemented to reduce light spillage (refer to appendix for general guidelines).		✓	✓		
The height of the PV panels should not exceed 5.5m above ground level without further visual and landscape impact assessment	✓	✓	✓		

[53] This has already incorporated into the preferred layout (Layout Alternative 1)

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
Control of lights at night to allow only local disturbance to the current dark sky night landscape (refer to appendix for general guidelines		✓		✓	
Continued erosion control and management of dust		✓		✓	
All structures should be removed and where possible, recycled		✓			✓
Building structures should be broken down (including foundations)		✓			✓
The rubble should be managed according to NEMWA and deposited at a registered landfill if it cannot be recycled or reused.		✓			✓
All compacted areas should be ripped to a depth of 500cm to loosen the soil, and then rehabilitated according to a rehabilitation specialist		✓			✓
Monitoring for soil erosion should be undertaken on a routine basis		✓			✓
Traffic					
The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.		✓	✓		✓
Dust suppression of gravel roads during the construction phase, as required.	✓	✓	✓		✓
Regular maintenance of gravel roads by the Contractor during the construction phase and by the Owner/Facility Manager during the operation phase.		✓	✓		✓
The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network.		✓	✓		✓
Staff and general trips should occur outside of peak traffic periods as far as possible.		✓	✓		✓
If required, low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.		✓	✓		✓
The preferred route should be surveyed to identify problem areas (e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification). After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading		✓	✓		✓

Mitigation	Condition of Approval	Included in EMPr	Construction[52] Phase	Operational Phase	Decommissioning Phase
of the construction phase and reinstated after construction is completed.					
Design and maintenance of internal roads. The internal gravel roads will require grading with a grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional.		✓	✓		✓
Avifauna					
Areas of already fragmented 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. The development footprint must be demarcate to ensure the development does not infringe on the surrounding areas.		✓	✓	✓	✓
Construction activity should be restricted to the immediate footprint of the infrastructure.		✓	✓		
Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.		✓	✓		
Measures to control noise and dust should be applied according to current best practice in the industry.		✓	✓		
Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum.		✓	✓		
The mitigation measures proposed by the botanical specialist must be strictly enforced		✓	✓		
A 100m solar panel exclusion zone must be maintained around sensitive areas i.e. rivers, pans, dams, water reservoirs and wetlands[54]	✓		✓		
Increasing the spacing between at least the top two wires (to a minimum of 30cm) and ensuring they are correctly tensioned will reduce the snaring risk. If possible, a single perimeter fence should be used		✓		✓	
The whole grid connection needs to be marked with Eskom approved bird flight diverters. The bird flight diverters should be installed on the full span length on the earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices	✓			✓	

[54] This 100m exclusion area has already been incorporated into the design.

8. PUBLIC PARTICIPATION PROCESS

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 a quick reference to show how this environmental process has or intends to comply with these legislated requirements relating to public participation.

Please refer to **Appendix F**, where all evidence of public participation is included.

Table 62: Public participation requirements in terms of S41 of R982

Regulated Requirement	Description
(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) Sub regulation (1) does not apply in respect of-. (a) linear activities;	Proof of landowner consent for Roan 2 PV is attached in **Annexure G2.** .
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;	A site notice was placed at three positions along the property boundary along the main road. Photographic evidence and the location of these notices is attached in **Annexure F3**.
(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 notify any tenants on the propsert. There are no tenants that that fall within the footprint of the proposed PV.
(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 have been notified of this environmental process. Such owners have been requested to inform the occupiers of the land of this environmental process. Please refer to **Annexure F4** for copies of these notifications
(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.

Regulated Requirement	Description
	Please refer to **Annexure F4** for copies of these notifications
(iv) the municipality which has jurisdiction in the area;	The City of Matlosana municipality (Planning and Technical Services) as well as the Dr Kenneth Kaunda District Municipality have been notified of this environmental process. Please refer to **Annexure F4** for copies of these notifications.
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	Please refer to section **Annexure F1** showing the list of organs of state that were notified as part of this environmental process. Please refer to **Annexure F4** for copies of these notifications.
(vi) any other party as required by the competent authority;	The DFFE has been given an opportunity to comment on this Draft BAR, any other parties identified will be given an opportunity to comment.
(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 of I&APs and notifying of the availability of the Draft Basic Assessment Report was placed in Die Noordwester local newspaper. Please refer to **Annexure F3** for a copy of this advertisement. 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 were not 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 sub regulation (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;	Please refer to **Annexure F3**.

Regulated Requirement	Description
(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.	
(4) A notice board referred to in sub regulation (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.	Please refer to **Annexure F3**.
(5) Where public participation is conducted in terms of this regulation for an application or proposed application, sub regulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that - (a) such process has been preceded by a public participation process which included compliance with sub regulation (2)(a), (b), (c) and (d); and (b) written notice is given to registered interested and affected parties regarding where the - (i) revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b); (ii) revised environmental impact report or EMPr as contemplated in regulation 23(1)(b); or (iii) environmental impact report and EMPr as contemplated in regulation 21(2)(d); may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	This will be complied with if final reports are produced later on in the environmental process.
(6) When complying with this regulation, the person conducting the public participation process must ensure that - (a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and (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.	All reports that are submitted to the competent authority will be subject to a public participation process. These include: - Draft BAR - Draft EMPr - All specialist reports that form part of this environmental process.

Regulated Requirement	Description
(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.	

8.1 REGISTRATION OF KEY STAKEHOLDERS

A number of key stakeholders were automatically registered and were given an opportunity to comment on the Draft BAR. Copies and proof of these notifications are included in **Annexure F4**. A list of key stakeholders registered for this process included in the table below.

Table 63: Key Stakeholders automatically registered as part of the Environmental Process

Stakeholders Registered		
Neighbouring property owners	Department of Environmental Affairs (North West)	Department of Water and Sanitation
North West Department of Transport and Public Works	Beaufort West Municipality	Department of Science and Technology
Beaufort West Municipality: Ward 2 Councillor	South African National Roads Agency Limited	The Council for Scientific and Industrial Research
South African Heritage Resources Agency	Heritage North West	The South African Square Kilometre Array
Catchment Management Agency	Department of Health	The South African Civil Aviation Authority
Department of Forestry, Fisheries and the Environment: Biodiversity Conservation Directorate	Department of Minerals and Energy	Affected Landowners
Provincial Department of Agriculture	Eskom	Department of Communications
Endangered Wildlife Trust.	Department of Mineral Resources	SENTECH
Cape Nature	Birdlife South Africa.	South African National Defence Force.
Renosterberg Safari	ATNS	Department of Water and Sanitation

8.2 PUBLIC PARTICIPATION PLAN

A Public Participation Plan was submitted and approved 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 was utilised to present this plan to the Department for approval. The public participation plan was approved by the Department.

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.

In order to comply with this requirement, all parties listed in sub sections a, b and c above with full digital copies of the Draft Basic Assessment Report (DBAR), Draft Environmental Management Programme and all specialist studies and plans. Such digital copies have been provided to the competent authority via the file upload portal. Copies of the documentation to organs of state and state departments have been provided via two digital platforms (website and direct download link). Where such authorities do not have access to digital platforms, sanitised copies of the documentation will be provided to such parties on their request.

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 Draft BAR via the following:

1. The digital copy of the documentation that will be on the Cape EAPrac website and direct download link.
2. 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.

8.3 AVAILABILITY OF DRAFT BASIC ASSESSMENT REPORT.

This Draft Basic Assessment report is available to all Registered and Potential Interested and Affected Party for a 30 day-comment period extending from **29 April 2022 – 03 June 2022.**

9. CONCLUSION AND 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 Basic Assessment 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 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 BAR 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 BAR that will be submitted to DFFE for decision making.

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 and the proposed grid connection corridor be considered for 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.

9.1 REMAINDER OF ENVIRONMENTAL PROCESS

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

- All registered I&AP's are provided with an opportunity to review and comment on this document.
- All comments will be considered and responded to and the proposed development adapted where necessary.
- The Final BAR will then be submitted to the DFFE for consideration and decision-making;
- The DFFE's decision (Environmental Authorisation) and the appeal process will be communicated with all registered I&APs.

10. ABBREVIATIONS

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

NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PM	Post Meridiem; “Afternoon”
PSDF	Provincial Spatial Development Framework
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
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

11. REFERENCES

[55]**DEA** (2010). National Climate Change Response Green Paper 2010.

DEA (January 2008). *National Response to South Africa's Electricity Shortage.* Interventions to address electricity shortages.

DEA&DP (2003). Waste Minimisation *Guideline for Environmental Impact Assessment reviews.* NEMA EIA Regulations Guideline & Information Series, Department Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for the review of specialist input in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for involving biodiversity specialists in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Guideline for environmental management plans*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2005). *Provincial urban edge guideline*. Department Environmental Affairs & Development Planning.

DEA&DP (2006). *Guideline on the Interpretation of the Listed Activities.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guide on Alternatives,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Appeals,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Exemption Applications.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2007). *Guideline on Public Participation*. NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Need & Desirability,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Alternatives*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Transitional Arrangements,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Exemption Applications*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP (2009). *Guideline on Appeals*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

[55] This reference list excludes specialist studies that form part of this environmental process, and which are contained in Annexure E1 – E12

DEA&DP (2009). *Guideline on Public Participation*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEA&DP. (May 2006). *Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape*: Specialist Study: Executive Summary - CNdV Africa prepared for Provincial Government of the Western Cape.

Department of Mineral & Energy (1998). White Paper on Energy Policy of the Republic of South Africa**.**

Department of Mineral & Energy (2003). *The White Paper on Renewable Energy***.**

DEAT (2002). Integrated Environmental Management Information Series 3: *Stakeholder Engagement*. Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2004). *Criteria for determining alternatives in EIAs*, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2004). *Environmental Management Plans*, Integrated Environmental management, Information Series 12, Department Environmental Affairs & Tourism.

DEAT (2005). *Assessment of Impacts and Alternatives*, Integrated Environmental Management Guideline Series, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2005). Guideline 4: *Public Participation*, in terms of the EIA Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2006). *EIA Regulations* in terms of the National Environmental Management Act (Act No 107 of 1998) (Government Notice No R 385, R 386 and R 387 in Government Gazette No 28753 of 21 April 2006).

DWA (2001). *Generic public participation guideline*. Department of Water Affairs and Forestry.

Hsai-Yang, F (Ed)(2006). *Environmental Geotechnology Dictionary* (online version). University of North Caroline, Charlotte, USA.

Integrated Resource Plan for Electricity (Oct. 2010). Revision 2, Version8.

International Finance Corporation – World Bank Group. (April 2007). Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution.

International Finance Corporation – World Bank Group. (April 2007). *Environmental, Health and Safety Guidelines for Wind Energy.*

International Finance Corporation – World Bank Group. (April 2007). *General Environmental, Health and Safety Guidelines.*

Keatimilwe K & Ashton PJ 2005. *Guideline for the review of specialist input in EIA processes.* Department Environmental Affairs & Development Planning.

Lochner P (2005). *Guideline for Environmental Management Plans*. Department Environmental Affairs & Development Planning.

Lower Orange River Trans frontier Conservation Area Planning: Background Information Document (August 2007). Retrieved on 29 March 2012 from:

www.dwaf.gov.za/Documents/Other/RMP/LOR/LORRMPBIDAug07.pdf

Mucina, L. & Rutherford, M.C. (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.* South African National Biodiversity Institute, Pretoria.

Münster, F. (2005). *Guidelines for Determining the Scope of Specialist Involvement in EIA Processes: Edition 1.* CSIR Report No ENV-S-C 2005 053 A. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

Oberholzer B (2005). *Guideline for involving visual & aesthetic specialists*. Department Environmental Affairs & Development Planning.

National Energy Regulator of South Africa (NERSA)(Feb.2010). Rules on selection criteria for renewable energy projects under the REFIT Programme.

National Protected Area Expansion Strategy for S.A. 2008: Priorities for expanding the protected area network for ecological sustainability and climate change adaptation. Government of South Africa, Pretoria, 2010. ISBN 978-1-919976-55-6.

Northern Cape Business online. Retrieved from: http://www.northerncapebusiness.co.za on 27 March 2012.

Northern Cape Business online. *Solar Power.* Retrieved from: http://www.northerncapebusiness.co.za/special_features/941417.htm on 27 March 2012.

Saayman, I. (2005). *Guideline for Involving Hydrogeologists in EIA Processes: Edition 1.* CSIR Report No ENV-S-C 2005 053 D. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

SANBI Biodiversity GIS (2007). South African National Biodiversity Institute, Cape Town, South Africa.

Winter S & Beaumann N (2005). *Guideline for involving heritage specialists in EIA processes.* Department Environmental Affairs & Development Planning.