

APPENDIX E4: Agricultural Impact Assessment



AGRICULTURAL ASSESSMENT:

PROPOSED PARYS UP TO 200 MW SOLAR PHOTOVOLTAIC (PV)
AND BATTERY ENERGY STORAGE SYSTEM (BESS) HYBRID PROJECT
NEAR THE TOWN OF PARYS

FREE STATE PROVINCE

Compiled for
NEMAI GREEN

Compiled by
Dr Andries Gouws Index

September 2022

DECLARATION

The observations, conclusions and recommendations made in this report are based on the best available data and on best scientific and professional knowledge of the directors of INDEX (Pty) Ltd. The report is based on GIS programming and utilises satellite tracking to map survey points. Survey points are normally accurate to within 3 metres; which must be considered in the use of the information.

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The property and copyright of this report shall remain vested in INDEX (Pty) Ltd. The client that commissioned the report may use the information as it may think fit; but only for the land for which it was commissioned.

General declaration:

- INDEX acted as the independent specialist in this application;
- Performed the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- There were no circumstances that may compromise INDEX's objectivity in performing such work;
- INDEX have expertise in conducting the specialist report relevant to this application, including knowledge of NEMA and its regulations and any guidelines that have relevance to the proposed activity;
- Have no and will not engage in conflicting interests in the undertaking of the activity.
- The study was undertaken by Dr Andries Gouws. He is a registered member of SACNASP in the category of Agriculture.



September 2022

CONTENTS

1	BACKGROUND.....	5
2	METHODS AND PROCEDURES	5
3	SITE EVALUATION.....	6
3.1	Present land uses	6
3.1	Climate	8
3.2	Soil properties.....	9
3.3	Vegetation	9
3.4	Water	10
4	PROPOSED DEVELOPMENT	10
5	SENSITIVITY ANALYSES	11
5.1	Ecological sensitivity – screening tool.....	11
5.2	Specialist site analyses	12
5.3	Specialist declaration.....	15
6	IMPACT ASSESSMENT.....	16
6.1	Assumptions.....	16
6.2	Rating criteria.....	17
6.3	Impact rating.....	18
7	MITIGATION OF INDIRECT IMPACTS	20
8	CONCLUSIONS AND RECOMMENDATIONS	20
9	Recommendation	21
10	ADDENDA.....	22
10.1	Sources of information	22
10.2	SACNASP certificate.....	22
10.3	Curriculum Vitae (CV).....	23
10.4	Photos	24

SUMMARY

Genesis Eco-Energy Developments (Pty) Ltd has proposed the development of a Solar PV and BESS Hybrid Project near the town of Parys in the Free State Province. The site is located approximately 3,5km to the south-east of the town of Parys.

Animal grazing is the largest land use, followed by crop production. Most of the grazing land has rock outcrops and, therefore, is not arable. Potentially arable land is all cultivated. They are mostly deep reddish or dark brown soils with moderately developed blocky structure. All cultivated medium and high potential land have been excluded from the proposed area for the PV project. The area proposed for the development consists of structured and shallow and rocky soils that have low potential.

The development area of 328ha is grassland will be fenced and not be available for animal grazing for the life of the project.

PROPOSED DEVELOPMENT

The fenced area that will contain the PV panels and infrastructure is approximately 328ha. The section where the PV panels are placed, is 300ha. From a micro placement perspective, all highly sensitive arable land has been excluded from the development.

According to the screening tool, the site in general has high sensitivity for the land that was previously cultivated fields and medium sensitivity for the vacant and the grazing land.

FINDINGS

The development is on medium and low sensitive land, which is a variation to the findings of the screening tool. A detailed assessment found that the sensitivity is low or medium and not high or very high as found with the tool.

- Thirty eight percent is potentially arable and falls into Class iv, but they are shallow and have moderate potential – it is medium sensitive agricultural land. The balance of 60% is on shallow and rocky soils that is not arable and only suitable for animal grazing.
- Many rocky outcrops were found on the southern section of the farm where a section of the PV site is proposed. This is the area that the Screening Tool indicated as medium sensitive towards agriculture. However, the screening tool did not consider the rock outcrops and spots that are waterlogged.
- Having taken the former into consideration, the conclusion is that the site is medium to low sensitive to farming.

IMPACT

- **LOSS OF HIGH POTENTIAL LAND:** There will be no loss of high potential land. No impact and no mitigation required.
- **LOSS OF GRAZING LAND:** Land proposed for the PV site is used for animal grazing. Construction will affect a maximum of 54 LSU. The impact is low. Mitigation is achieved by concentrating infrastructure and still allows grazing to take place on vacant land.
- **LOSS OF AGRICULTURAL PRODUCTION:** No cultivated land will be lost. The land can yield an annual income of R459 000. Mitigation is achieved by concentrating infrastructure and still allow grazing to take place on vacant land. The impact is low.

RECOMMENDATION

The site is located in a predominantly animal grazing on low potential land. The income that can be generated by the land proposed for the PV project will only make a negligible contribution to the local or country's economy.

No high potential land will be lost. Grazing land will have a low to moderate impact on local farmers.

It is recommended that PV project be approved.

1 BACKGROUND

Genesis Eco-Energy Developments (Pty) Ltd has proposed the development of the Parys up to 200MW Solar PV and BESS Hybrid Project near the town of Parys in the Free State Province. The electricity generated by the Project will be injected into the existing Eskom 132 kV distribution system. The site is located in the northern part of the Free State Province and falls within the Fezile Dabi District Municipality and Ngwathe Local Municipality. The site is located approximately 3,5km to the south-east of the town of Parys and is bisected by the R723.

Index was appointed by Elemental Sustainability to do an agricultural impact assessment in terms of Notice No. 320 Government Gazette 43110 20 March 2020 of the proposed PV site.

The overall size of Remainder of Leeuwkruil 76 is approximately 1234ha, of which the combined buildable area is split over 3 areas, is approximately 335 ha (refer to **Error! Reference source not found.**).

The assessment and reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool) for agricultural resources. It is based on the land capability evaluation values provided by the Department of Agriculture, Land Reform and Rural Development (DALRRD).

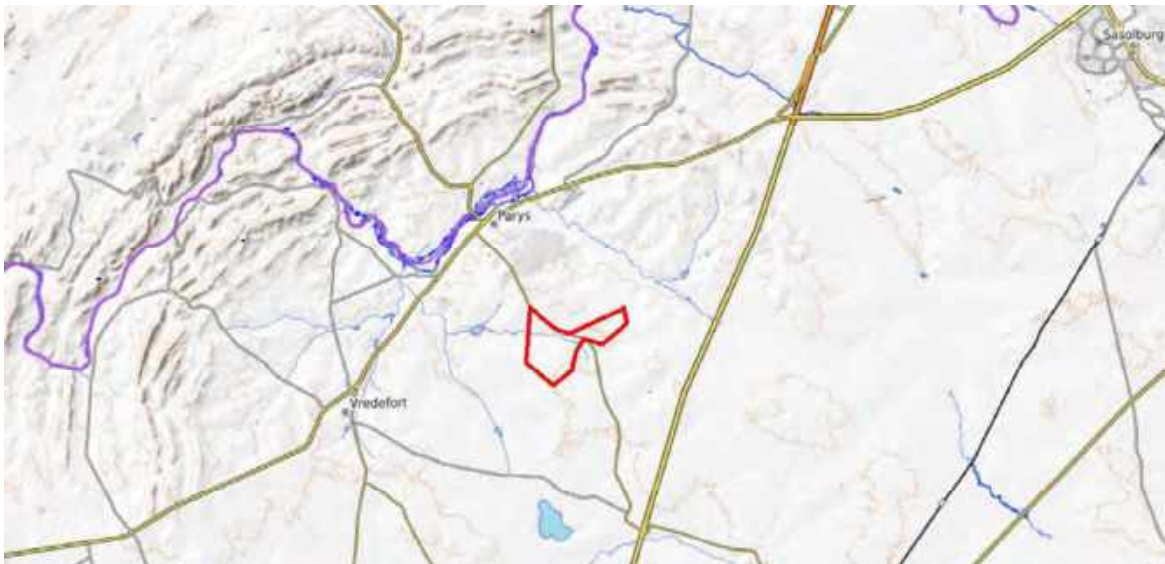


Figure 1. Locality of the PV Area

2 METHODS AND PROCEDURES

SITE SENSITIVITY VERIFICATION

The current use of the land and the environmental sensitivity of the site are available in the screening tool¹, and were used in assessing the site.

- The site verification was done through use of satellite imagery and a site inspection;
- The outcome of the site verification is described in this report.

The report will compare the current land use to the environmental sensitivity as identified by the screening tool. It will indicate, according to the requirements of the Environmental Impact Assessment Regulations as amended, the differences between the screening tool and the actual status as found by the site visit.

¹ <https://screening.environment.gov.za/screeningtool>.

SITE EVALUATION PROCESS

The results of this study followed a site visit on 9 September 2022. Satellite images were used as backdrop and the present land uses digitised. A number of soil profiles were assessed by using a soil augur or soil probe.

Vegetation was simultaneously logged to determine veld condition. Grazing capacity is according to DALRRD and then adapted to present veld conditions.

Capability classification is according to the guidelines published on the AGIS website of the National Department of Agriculture (NDA) was used to determine the capability of soils and their agricultural potential (DALRRD, 2019).

Climate data was obtained from SA Weather and other on-line sources available on the internet.

Fifty-eight observations were made that focussed mainly of soil depth and vegetation condition. Their locations are indicated below:

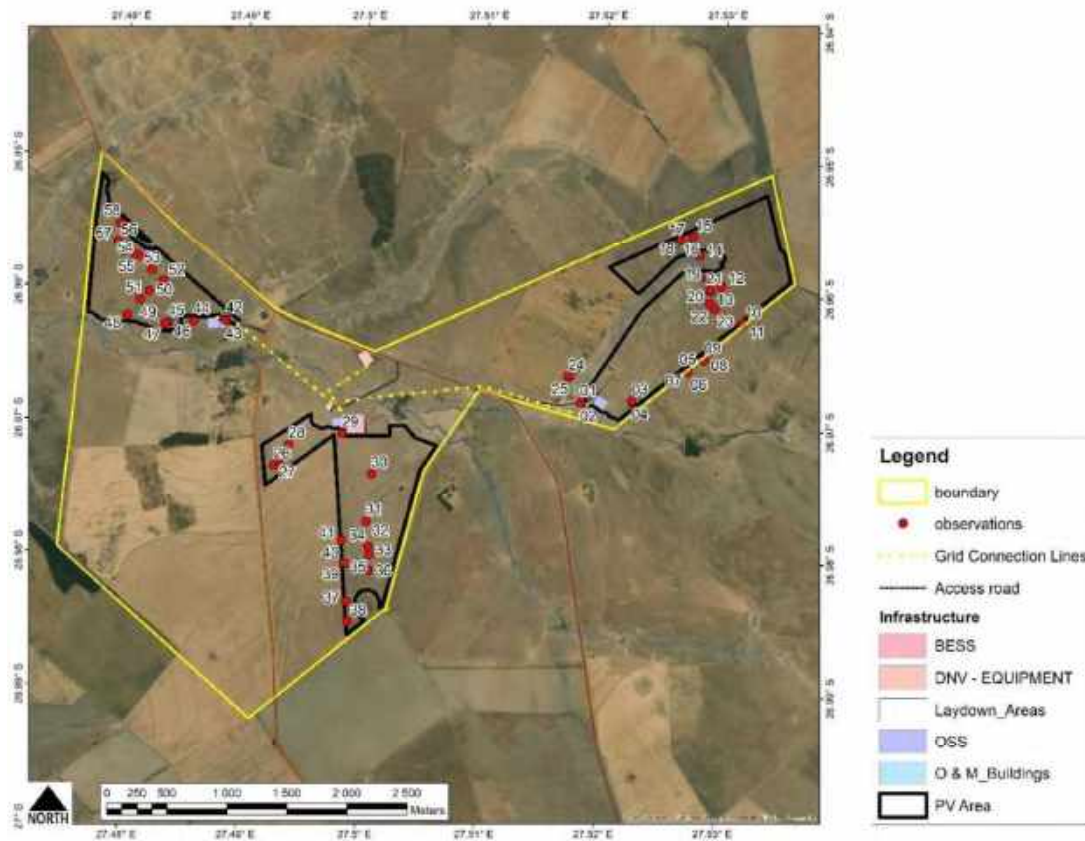


Figure 2. Observation

3 SITE EVALUATION

3.1 PRESENT LAND USES

Animal grazing is the largest land use, followed by crop production. There is some fallow land that has reverted to grazing in the northern part of the site. Most of the grazing land has rock outcrops and, therefore, is not arable.

The cultivated land is rented out and annually planted to summer crops like maize or beans.

Some of the lands have portions that are waterlogged. Refer to Figure 3 for the land uses.

The land owner farms with Santa Gertrudis livestock. They are in excellent condition.

Table 1. Land uses on the whole farm

Land use	Area (ha)
Cultivation	382.4
Fallow	96.5
Grazing	697.5
Housing	4.0
Infrastructure	2.5
Pastures	38.4
Total	1 221.4

Veld grazing is the primary source of fodder. Stover left after harvesting of the summer crops is used as fodder for mid and late winter.

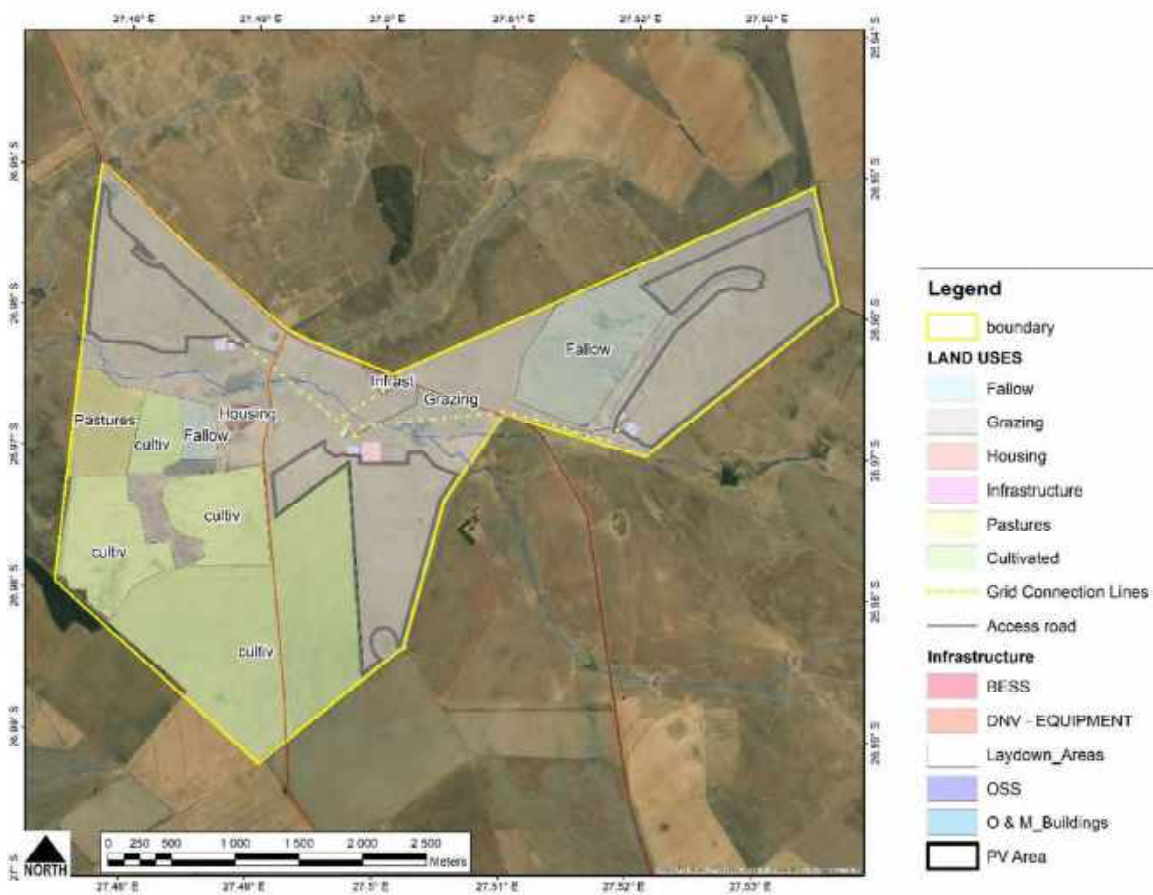


Figure 3. Present land uses of the total site

REGIONAL LAND USES

Mixed farming that consists of livestock grazing and rainfed crops occur south and east of the site. North is the town of Parys and grazing land.

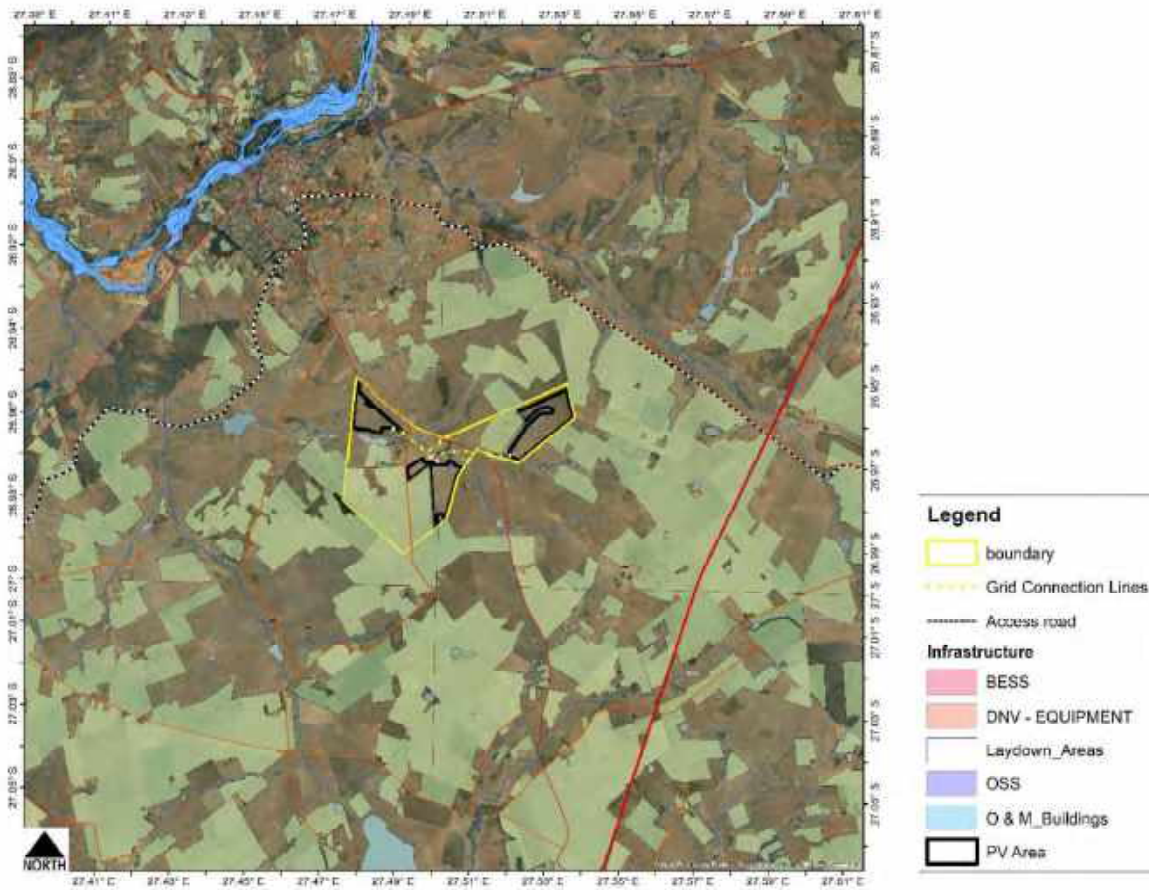


Figure 4. Regional agricultural land uses green indicates cultivated lands

3.1 CLIMATE

RAINFALL

The average annual rainfall varies between 590mm and 638mm for the different stations in and around the site. Rain occurs mainly during the summer months, commencing in October lasting to March. This is typical of the summer rainfall pattern of the Highveld region of South Africa.

Table 2. Total annual rainfall

Station	Record	MAP	Altitude
Number	(Years)	(mm)	(m)
VREDEFORT	93	638	1408
PARYS	95	590	1405
TIERFONTEIN	54	620	1397
GOEDHEID	49	602	1380
WOOLDRIGDE	55	634	1470
HARTEBESTPOORT	73	606	1457

HAIL

Hail can be expected 3 to 5 times per year and may cause damage to crops. It normally occurs during thunder storms in the early part of the rainy season when deciduous fruit are at its most vulnerable.

There is a general trend for fruit farmers to install netting to protect their crops.

WIND

The predominant wind direction is north, varying between north-easterly and north-westerly. Wind damage is not normally expected to be a deciding factor in crop selection.

TEMPERATURE

The average daily temperature varies from 18,5°C in July to 27,9°C in January. The lowest daily minimum



3.4 WATER

There are no streams or rivers that could supply water for irrigation. Boreholes supplies water for the livestock.

4 PROPOSED DEVELOPMENT

The fenced area that will contain the PV panels and infrastructure is approximately 328ha. The section where the PV panels are placed is 300ha.

All the infrastructure is placed on grazing land with no arable potential.

From a micro placement perspective, all highly sensitive arable land has been excluded from the development.

Land on which the infrastructure is placed consists of shallow and medium depth soils that are rocky or strongly structured and are not suitable for cultivation.

Detail of the classification is provided in Section 3.2 and the land use capability, in Section 5.

Table 3. Size per land use

Activity	Size (ha)
BESS	2.21
DNV - EQUIPMENT	1.00
Laydown Areas	6.50
O & M Buildings	0.75
OSS	2.80
Total farm Boundary	1 231.25
Project Fencing	328.67
PV Area	299.62

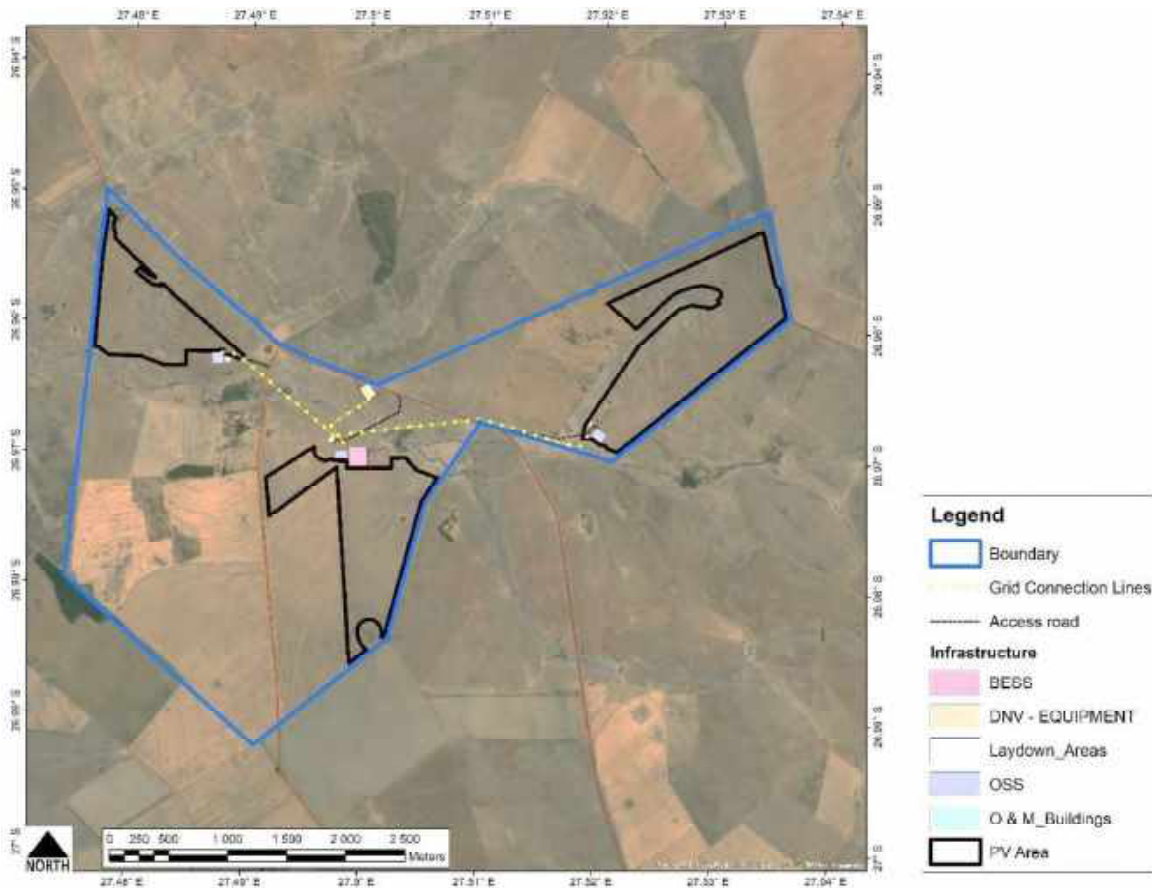


Figure 6. Proposed infrastructure

5 SENSITIVITY ANALYSES

5.1 ECOLOGICAL SENSITIVITY – SCREENING TOOL

BACKGROUND

The Department of Forestry, Fisheries and Environment published Notice 320 in 2020 that describes the minimum criteria when applying for environmental authorisation.

This protocol provides the criteria for the assessment and reporting of impacts on agricultural resources for activities requiring environmental authorisation. The assessments requirements of this protocol are according to the level of environmental sensitivity as indicated by the national web-based environmental screening tool for agricultural resources. It is based on the most recent land capability evaluation as provided by the DALRRD.

An applicant intending to undertake an activity identified in the scope of this protocol on a site identified on the screening tool as being of “very high” or “high” sensitivity for agricultural resources must submit an Agricultural Agro-Ecosystem Specialist Assessment unless:

- The application is for PV.
- Information gathered from the site sensitivity verification differs from the designation.

According to the screening tool, the site in general has high sensitivity for the land that was previously cultivated fields and medium sensitivity for the vacant and the grazing land.

The dataset extracted from the tool indicates the high sensitivity land occurs only on a portion on the western boundary.

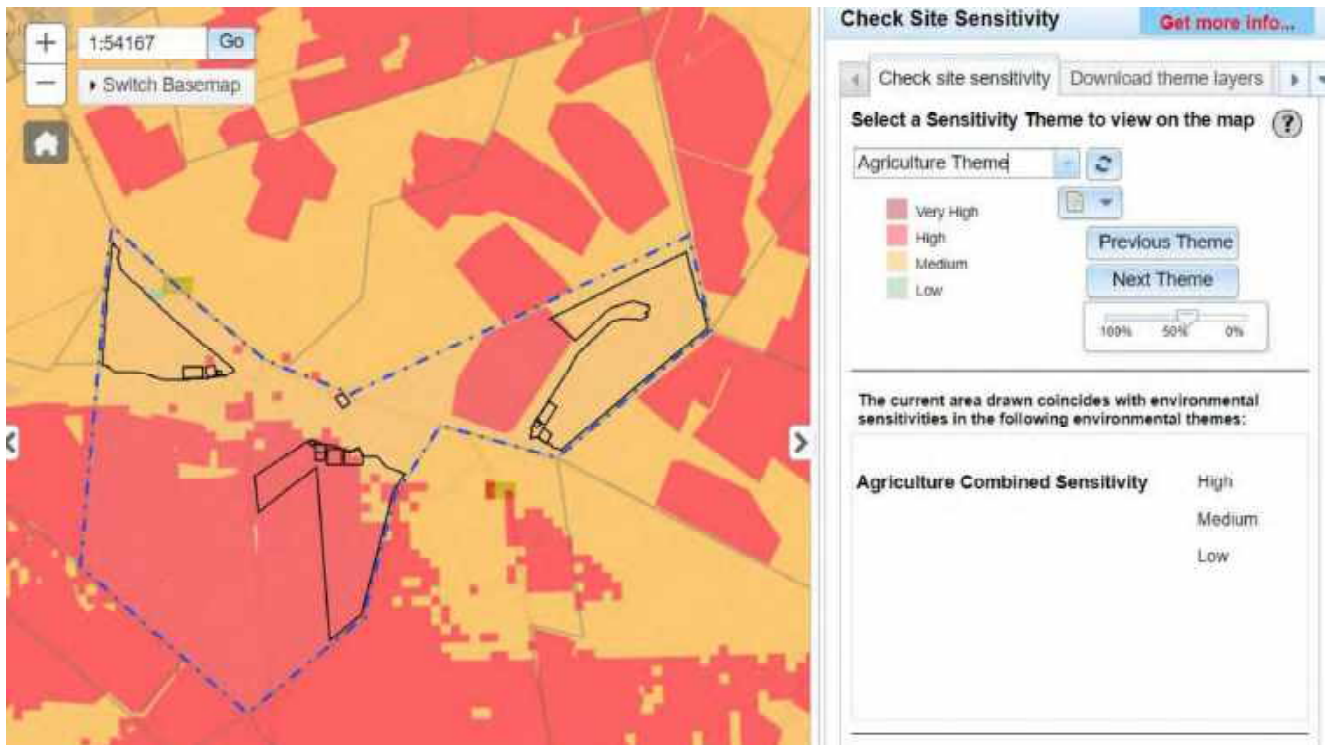


Figure 7. Results of the Screening tool

5.2 SPECIALIST SITE ANALYSES

According to the guidelines of the protocol, for the assessment and minimum report content for EIA impacts on agricultural resources, the following applies:

The development is on medium and low sensitive land, which is a variation to the findings of the screening tool.

A detailed assessment found that the sensitivity is low or medium and not high as found with the tool. Provision 1.1.3 in the Protocol applies, which requires the specialist to submit an Agricultural Compliance Statement. This statement is provided in Section 5.3.

The following will evaluate the land proposed for the development.

LAND USE CAPABILITY

Land capability classes are interpretive groupings of land with similar potential and limitations or similar hazards.

The classic eight-class land capability system (Klingebiel & Montgomery, 1961) was adapted for use by the South African Department of Agriculture in their Agriculture Geographic Information System (AGIS). Land capability is classified according to guidelines published by the National Department of Agriculture in AGIS.

Land Capability is determined by the collective effects of soil, terrain and climate features and shows the most intensive long-term use of land. At the same time, it indicates the permanent limitations associated with the different land-use classes (refer to Table 1).

- Order A: Arable land – high potential land with few limitations (Classes i and ii);
- Order B: Arable land – moderate to severe limitations (Classes iii and iv);
- Order C: Grazing and forestry land (Classes v, vi and vii);
- Order D: Land not suitable for agriculture (Class viii).

Table 4. Land capability classes – intensity of land uses

LAND CAPABILITY			Wildlife	Grazing and Forestry			Crop production			
Order		Class		Forestry	Veld	Pastures	Limited	Moderate	Intensive	Very intensive
Arable	A	i								
		ii								
	B	iii								
		iv								
Non arable	C	v								
		vi								
	D	vii								
		viii								

Note: the shaded area indicates the suitable land use.

FINDINGS

Figure 8 and Figure 9 indicate the Land use capability as per the criteria in AGIS of DALRRD.

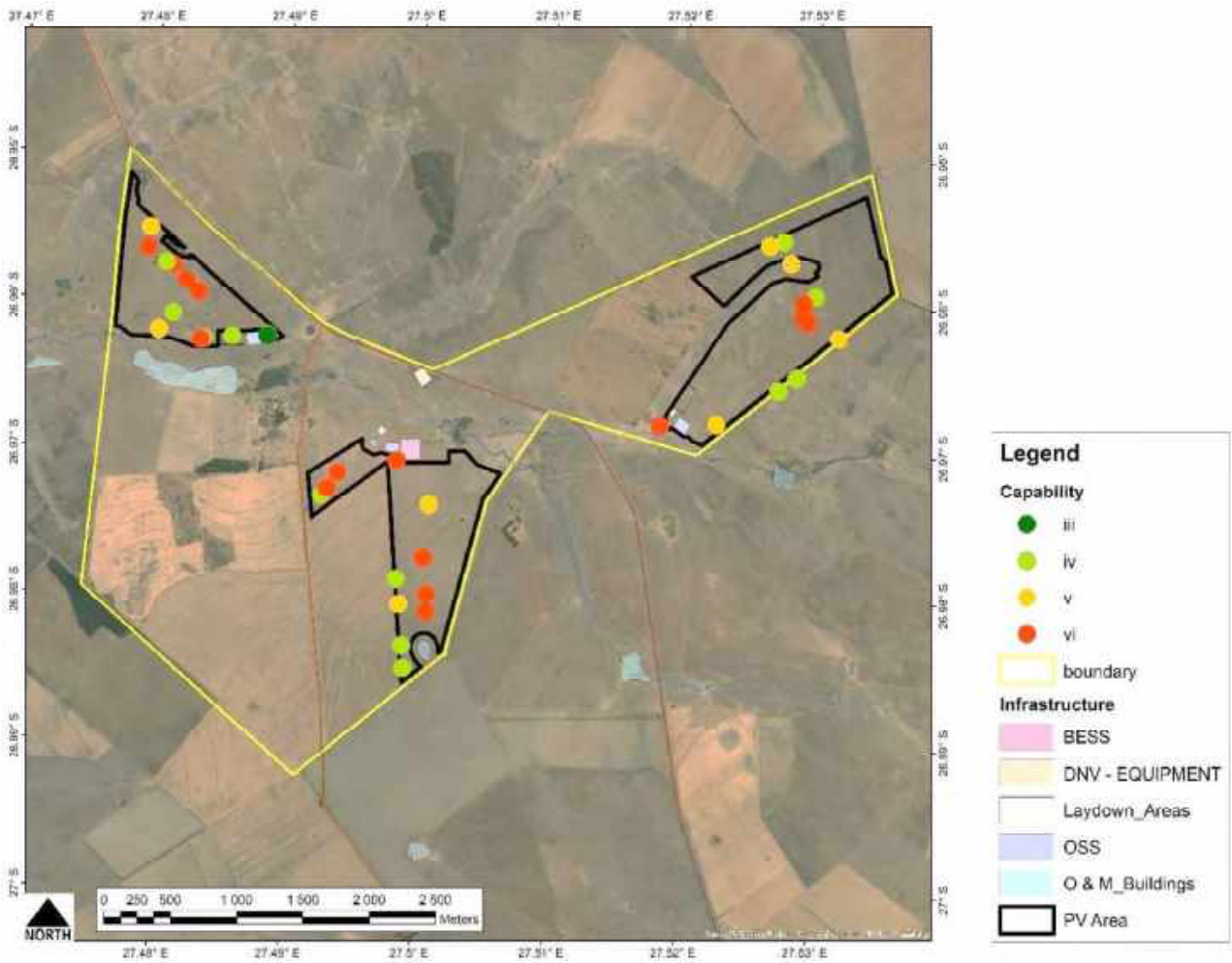


Figure 8. Land capability description

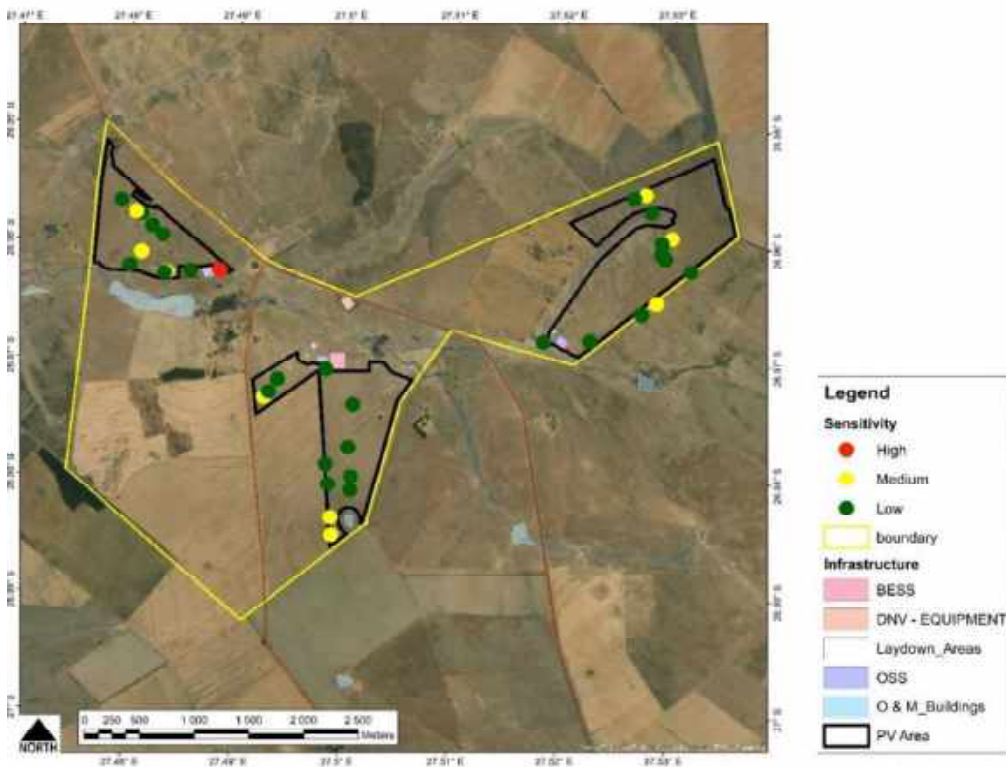


Figure 9. Land sensitivity description

The following were found:

- Figure 8 indicates the land use capability of the soil observations. Note that the land within the footprint was assessed and not the entire property. Some observations, however, were made on the cultivated land in order to evaluate the micro placement of the infrastructure.
- Of the 42 observations made, only 2,4% is arable. It falls into Class iii capability. Thirty eight percent is potentially arable and falls into Class iv, but they are shallow (depth less than 500mm) and have moderate potential and is medium sensitive agricultural land. The balance of 60% is on shallow and rocky soils that is not arable and only suitable for animal grazing.



Photo 1. Shallow soil on laterite subsoil



Photo 2. Medium depth Avalon soil

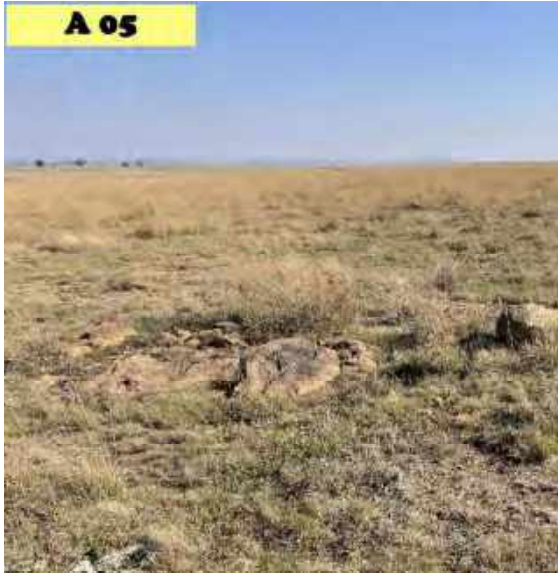


Photo 3. Example of shallow rocky soils



Photo 4. Shallow soil with a strongly developed structure

- There is a direct relationship between soil capability and sensitivity. Of all the observations made, only small portions fall into the medium sensitive category. Due to rock outcrops and shallow surrounding soils, the land portions are too small to create a land unit that can gainfully be cultivated. This is likely also the reason why they have never been cultivated.
- Many rocky outcrops were found on the southern section of the farm where a section of the PV site is proposed and which was indicated by the screening tool as highly sensitive.

CONCLUSIONS

The screening tool did not consider the rock outcrops and waterlogged land in the southern portion.

Having taken these into consideration as well as the soil properties, makes the site moderately to low sensitive to farming.

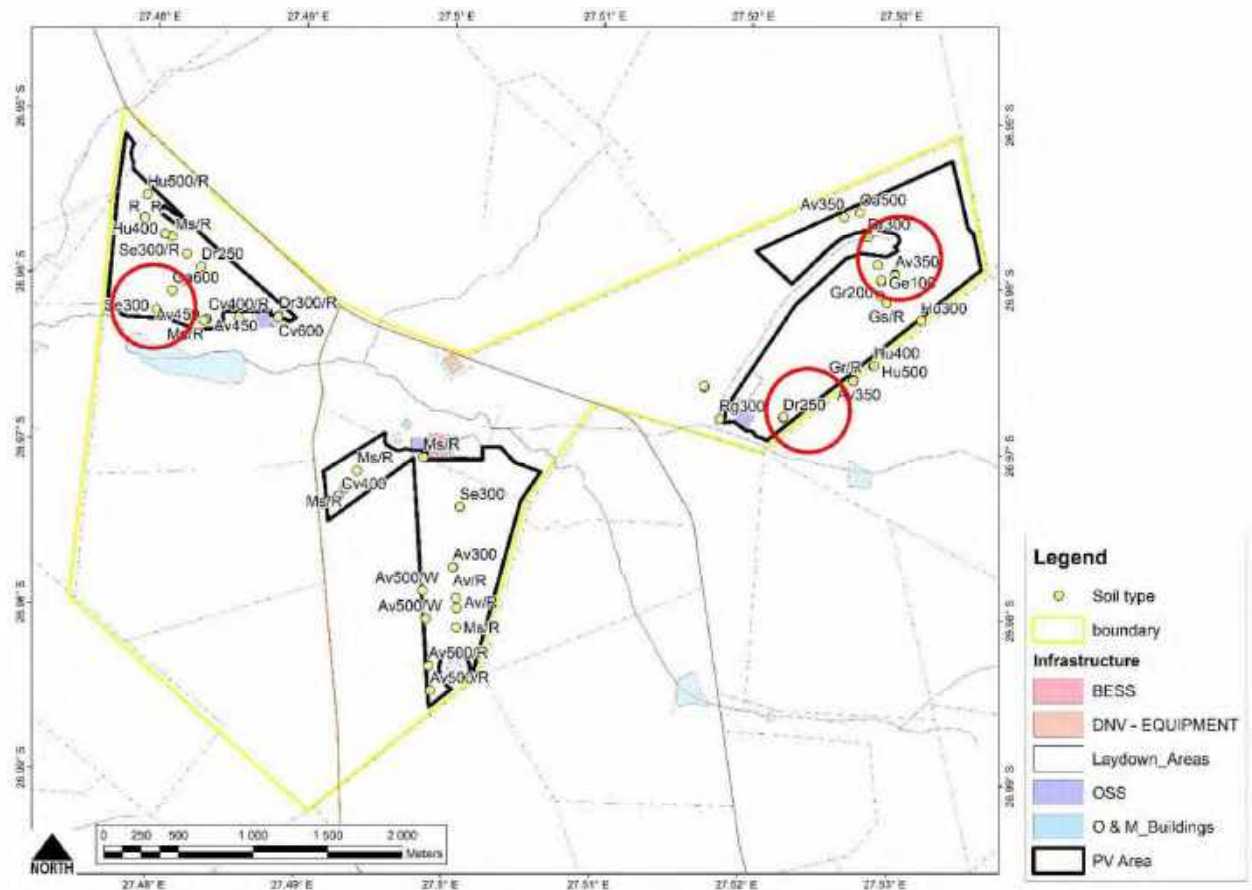
5.3 SPECIALIST DECLARATION

AGRICULTURAL COMPLIANCE STATEMENT

- SACNASP registration of specialist and a curriculum vita – Refer to Paragraph 9.2;
- A signed statement of independence by the specialist – Refer to Paragraph 1;
- The duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment. The main criteria for farming potential are soils, climate and water availability. These are not bound to seasons;
- For the description of the methodology used to undertake the on-site assessment: Refer to Paragraph 2;
- The proposed development is located on only low and medium sensitive land that is now used for grazing. The project area and the proposed footprint is indicated in Figure 7 in Section 5;
- Confirm that the site is of *low* or *medium* sensitivity for agriculture. Refer to Section 5. The site is indeed *low* or *medium* sensitivity. The proposed development will have a low impact on the agricultural production capability. Refer to Sections 3 and 5.2.
- A map showing the proposed development footprint on the agricultural sensitivity map is provided in Figure 6 and Figure 7;
- Confirmation that all reasonable measures have been taken through micro placement to avoid or minimise fragmentation and disturbance of agricultural activities: The assessment found that all arable land was

excluded and that the PV and infrastructure will only be placed on low and medium sensitive land.

- A statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development: The site is not located on any high potential land. Therefore, no reason can be found to not allow the development. It is our recommendation that the project be allowed to be implemented;
- There are no conditions to which the statement is subjected;
- Stormwater runoff measures should be put in place to ensure that erosion of soil does not occur. This applies especially on the structured soils where the infiltration rate of rainwater is impeded. A stormwater management plan should be included in the EMPr and strictly adhered to. General areas with soils that are potentially sensitive to erosion are indicated in red on the map below:



- Prevent contamination of groundwater and streams, and eradicate exotic plants;
- The survey took place at a period when crop residue was still on the field. It was, therefore possible to assess the soil's productivity and also the present state of the grazing land. No gaps in knowledge or data were found.

6 IMPACT ASSESSMENT

6.1 ASSUMPTIONS

LAND USES

The impact assessment is done for land that will be included into the development boundary. All the land is used for animal grazing at present.

LAND USE POTENTIAL CLASSES

High potential land is defined in CARA as follows:

Land best suited to, and capable of consistently producing acceptable levels of goods and services for a wide range of agricultural enterprises in a sustainable manner, taking into consideration expenditure of energy and economic resources. It includes:

- Land Capability Classes i, ii and iii;
- Unique agricultural land;
- Irrigated land; and
- Land suitable for irrigation (deep well-drained soils - assuming irrigation water is available). There is no irrigation water available, hence, this does not apply.

6.2 RATING CRITERIA

The following rating was used to indicate impacts:

EXTENT

- 1: Local - extend to the site and its immediate surroundings.
- 2: Regional - impact on the region but within the province.
- 3: National - impact on an interprovincial scale.
- 4: International - impact outside of South Africa.

MAGNITUDE

Degree to which impact may cause irreplaceable loss of resources.

- 0: None – no resources will be lost.
- 1: Low - natural and social functions and processes are not affected or minimally affected.
- 2: Medium - affected environment is notably altered.
- 3: High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
- 4: Very high – Will affect the continued viability of the system/environment.

DURATION

- 1: Short term: 0-5 years.
- 2: Medium term: 5-11 years.
- 3: Long term: impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- 4: Permanent: mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

PROBABILITY

- 1: Rare/Remote - the event may occur only in exceptional circumstances.
- 2: Unlikely - the event could occur at some time.
- 3: Moderate - the event should occur at some time.
- 4: Likely - the event will probably occur in most circumstances.

- 5: Almost certain - the event is expected to occur in most circumstances.

REVERSIBILITY

- 1. Definite
- 2. Probable
- 3. Possible
- 4. Unlikely

IRREPLACEABILITY

- 1. No loss of resources. Can be replaced elsewhere.
- 2. Marginal
- 3. Significant
- 4. Complete loss

SIGNIFICANCE

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated.

6.3 IMPACT RATING

The significance of each potential impact is calculated using the following formula:

$$\text{Significance points} = (\text{extent} + \text{probability} + \text{reversibility} + \text{irreplaceable} + \text{duration}) \times \text{magnitude}$$

The maximum value is 100 significance points (SP). The unmitigated and mitigated scenarios for each potential environmental impact should be rated as per Table 10 below.

Table 2. Significance rating

Score	Significance	Description of Rating
2 – 10	Low Significance	No specific management action required
10 – 20	Medium-low significance	Administrative management actions required
20 – 40	Medium significance	Management and monitoring action plans required
40 – 60	Medium-high significance	Specific management and monitoring plans required
>60	High significance	Detailed plans required, potential red flag impact

Table 3. Impact rating – Direct impacts

POTENTIAL ENVIRONMENTAL IMPACT / NATURE OF IMPACT	Extent	Probability	Reversibility	Irreplaceable	Duration	Magnitude	TOTAL (SP)	Significance	DISCUSSION AND MITIGATION
LOSS OF HIGH POTENTIAL AGRICULTURAL LAND									
Loss of land	0	0	0	0	0	0	0	L	There will be no loss of high potential land. No impact and no mitigation required.
LOSS OF GRAZING LAND									
Loss of grazing land	1	5	3	2	3	2	28	ML	Land proposed for PV site is used for animal grazing. At a grazing capacity of 6ha/LSU, the affected land can carry about 54 LSU. The impact is low. Mitigation is achieved by concentrating infrastructure and still allows grazing to take place on all vacant land.
LOSS OF AGRICULTURAL PRODUCTION									
Loss of crop production	0	0	0	0	0	0	0	L	No rainfed cultivated land will be affected. No impact.
Loss of animal production	1	5	4	2	3	2	30	M	328 ha of grazing land can potentially be lost for the duration of the project. Coupled with the stover value of the harvested fields, the land could roughly accommodate 54 LSU. Assuming a margin for livestock at R8 500/LSU. The annual loss in income is estimated at about R459 000. Mitigation is achieved by concentrating infrastructure and still allow grazing to take place on vacant land.
LOSS OF AGRICULTURAL INFRASTRUCTURE									
Direct loss	1	1	1	1	1	1	5	L	There are some watering facilities that is within the proposed fenced area. These can be moved. No impact and no mitigation required.
LOSS OF JOBS FROM FARMING									
Direct loss	1	1	1	1	3	1	7	L	Normally one labourer is required per 100 livestock. The livestock that can be assigned to the PV area can be tended by one labourer. The impact is low and mitigation can be achieved by absorbing him (or her) into the PV project.

7 MITIGATION OF INDIRECT IMPACTS

CONSTRUCTION PHASE

- Security during construction.
 - Fence off the construction area to protect adjoining farmers.
 - Join existing community policing forums and/or similar community structures.
- Dust can be problematic and suppression is necessary. This can be done by either spraying with water. Plant grass on all open areas to prevent dust from damaging crops or other farming activities.
- Make the contact details of the main contractors available to surrounding landowners and attend to any matters expediently.

OPERATIONAL PHASE

- Maintain fences in order to protect livestock entering the site.
- Hazardous substances should be safely disposed of or stored to minimise any impact on animals and water resources.
- Storm water drains must be maintained to ensure that no erosion takes place, especially on the portions indicated in Section 5.
- Pollution of surface and groundwater can be problematic for livestock. Contamination should be prevented.
- Groundwater quality should be monitored.
- Report and rectify erosion when detected.
- Eradicate weeds and invasive plants.
- Implement the Environmental Management Programme (EMPr) for the duration of the operations to eliminate potential socio-economic impacts on adjoining land owners and their livelihoods.

8 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- Thirty eight percent of the land where the PV's will be placed is potentially arable and falls into Class iv, but they are shallow and have moderate potential – it is medium sensitive agricultural land. The balance of 60% is on shallow and rocky soils that is not arable and only suitable for animal grazing.
- Many rocky outcrops were found on the southern section of the farm where a section of the PV site is proposed. This is the area that the Screening Tool indicated as highly sensitive towards agriculture. However, the screening tool did not consider the rock outcrops and spots that are waterlogged.
- Having taken the former into consideration, the conclusion is that the site is medium to low sensitive to farming.

IMPACT

Normally one labourer is required per 100 livestock. The livestock that can be assigned to the PV area can be tended by one labourer. The impact is low and mitigation can be achieved by absorbing him (or her) into the PV project.

- **LOSS OF HIGH POTENTIAL LAND:** There will be no loss of high potential land. No impact and no mitigation required.
- **LOSS OF GRAZING LAND:** Land proposed for the PV site is used for animal grazing. Construction will affect a maximum of 54 LSU. The impact is low. Mitigation is achieved by concentrating infrastructure and still allow grazing to take place on vacant land.
- **LOSS OF AGRICULTURAL PRODUCTION:** No cultivated land will be lost. The land can accommodate 54 livestock with a potential annual loss in income of about R459 000. Mitigation is achieved by concentrating infrastructure and still allow grazing to take place on vacant land. The impact is low.

9 RECOMMENDATION

The site is located in a predominantly animal grazing with a low potential. The income that can be generated by the land proposed for the PV project will only make a negligible contribution to the local or country's economy.

No high potential land will be lost. Loss of the grazing land will have a low to moderate impact on local farmers.

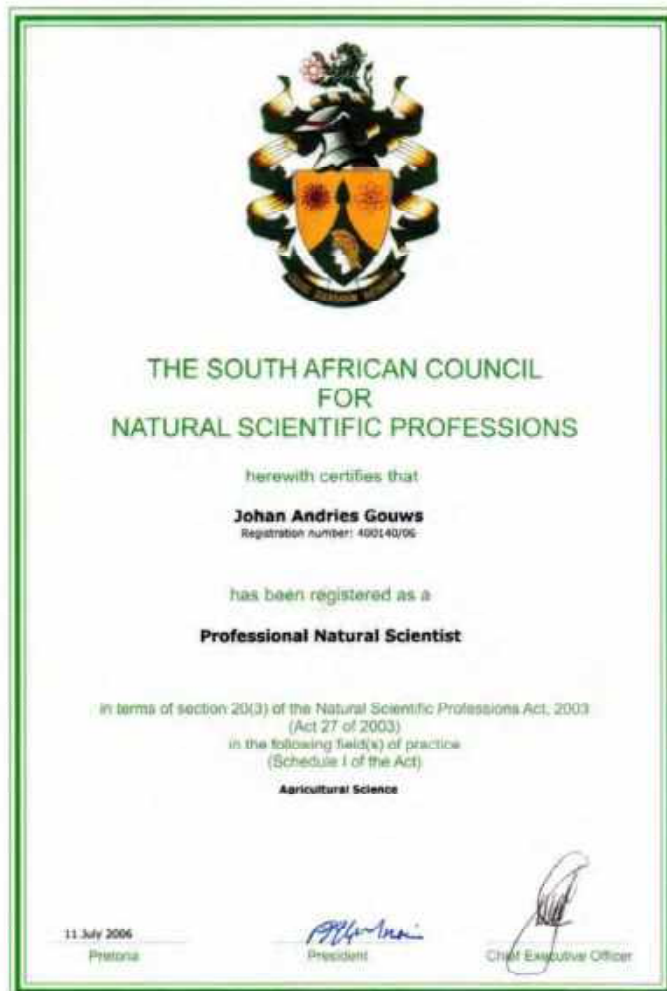
It is recommended that PV project be approved.

10 ADDENDA

10.1 SOURCES OF INFORMATION

- a) Criteria for high potential agricultural land in South Africa, Department of Agriculture, Directorate Land Use and Soil Management, 2002.
- b) Grondklassifikasie Werkgroep, 1991. Grondklassifikasie, 'n Taksonomiese sisteem vir Suid Afrika, Departement van Landbou-ontwikkeling, Pretoria.
- c) Department of Agriculture. Grazing capacity. Development of Agricultural Land Framework Bill , 2016
- d) WRC, 2003 South African Atlas of Agrohydrology and Climatology, Water Research Commission
- e) CROPWAT 8.0 has been developed by Joss Swennenhuis for the Water Resources Development and Management Service of FAO.

10.2 SACNASP CERTIFICATE



10.3 CURRICULUM VITAE (CV)

Position Title and No.	Agriculture, Land use planning and wetland specialist. INDEX
Name of Expert:	Andries Gouws
Date of Birth	12/04/1955
Country of Citizenship /Residence	South Africa

Education

Name of institution: College/University or other	Degree/diploma/certificate or other specialized education	Date completed
University of Pretoria, South Africa	BSc. Agriculture	1979
University of Bloemfontein	BSc. Honors, Agriculture	1987
Potchefstroom Collage for Agriculture	Diploma: Stereoscopic aerial photo interpretation of natural resources for farm planning	1981
University of South Africa	Diploma: Financial management	1992
University of Trinity	PhD: Integrated agricultural development	2007

Employment record relevant to the assignment:

Period	Employing organization and your title/position. Contact info for references	Country	Summary of activities performed relevant to the Assignment
1993 - current	INDEX - Director and co-owner: Responsibility: Agriculture and land use planning. Contact: Eugene Gouws - Director +27 82 55 33 787	RSA	Provided specialist assessment services in agriculture and land use planning for various development projects.

Membership in Professional Associations and Publications:

Soil Science society of South Africa.

South African Council for Natural Scientific Professions – Registered Professional Scientist (Reg no: 400140/06)

Adequacy for the Assignment:

Detailed Tasks Assigned on Consultant's Team of Experts:	Reference to Prior Work/Assignments that Best Illustrates Capability to Handle the Assigned Tasks
Position: Agricultural Specialist	Agricultural Impact Assessment for the Proposed Mookodi- Mahikeng 400kv Line. 2018. Client: Nemai Consulting
	Agricultural Impact Assessment for the Proposed Foxwood Dam 2015 – 2016 Compiled the specialist report on Agricultural impact Client: Nemai Consulting, DWS

	<p>Agricultural Impact Assessment for the Proposed Mokolo and Crocodile River (West) Water Augmentation Project (MCWAP) (2017 – 2019)</p> <p>Compiled the specialist report on Agricultural impact</p> <p>Client: Nemaï Consulting, DWS</p>
	<p>MSOBO COAL – HARWAR; economic study for the farming enterprises</p> <p>Discussion of the natural resources that influences agricultural potential; Farming and the potential for different enterprises; Indicate the potential income from main enterprises and Indicate the financial impact of the development on the farmers. (2013/4)</p> <p>Client: Demacon</p>
	<p>Agricultural potential study of Portion 21 (Portion 1) of the farm Koppieskraal 1157-IR</p> <p>2019.</p> <p>Client: Adv Johan du Plessis</p>
	<p>Agricultural Potential Assessment: Albany Wind Energy Facility & Grid Infrastructure Near Makhanda, Eastern Cape Province</p> <p>2020</p> <p>Client: CES Environmental and Social advisory Services</p>
	<p>Agricultural potential and impact assessment of Available Land At Mopeia, Mozambique</p> <p>2016</p> <p>Client: Barari Forest Management. Department: Research & Development</p> <p>Abu Dhabi</p>

Expert's contact information: E-mail: index@iafrica.com
Phone: +27 (0) 82 807 6717

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes my qualifications, my experience and myself.

Andries Gouws

Name of Expert

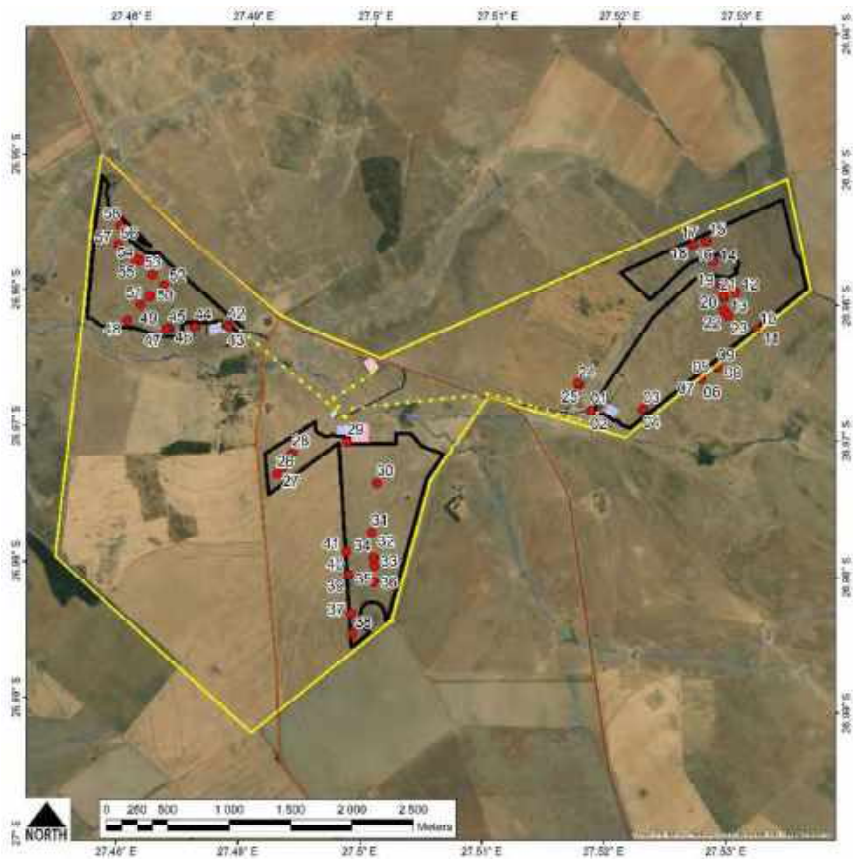


Signature

25/08/2022

Date

10.4 PHOTOS







A 48



A 49



A 50



A 51



A 52



A 53



A 54



A 55











A 26



A 27



A 28



A 29



A 30



A 31



**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: P001

Project name: PV - Parys

Project title: PV

Date screening report generated: 08/09/2022 08:44:49

Applicant: Nemaï

Compiler: A Gouws

Compiler signature:
.....

Application Category: Agriculture_Forestry_Fisheries|Crop Production

Table of Contents

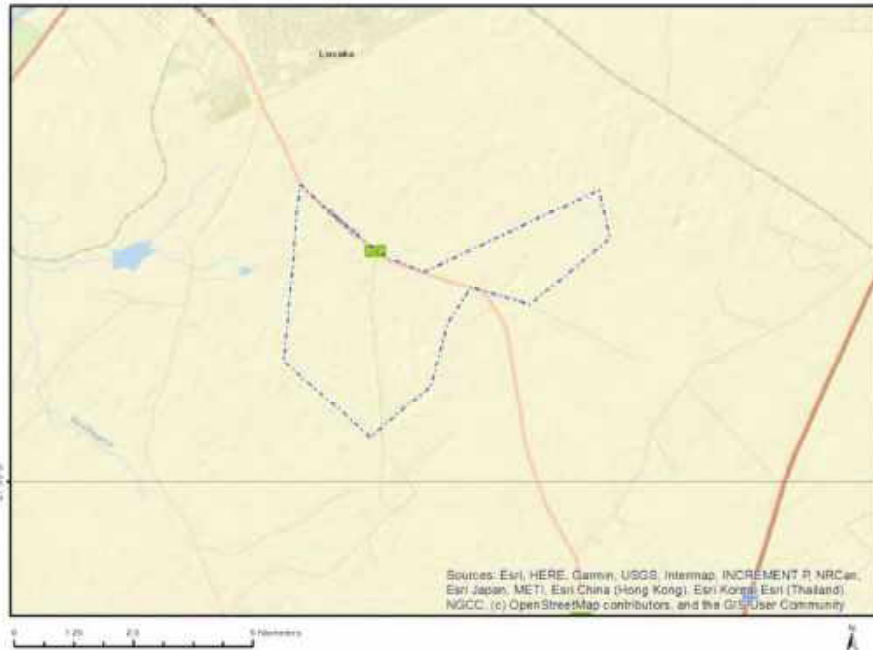
Proposed Project Location	3
Orientation map 1: General location	3
Map of proposed site and relevant area(s)	4
Cadastral details of the proposed site	4
Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area	4
Environmental Management Frameworks relevant to the application	5
Environmental screening results and assessment outcomes	5
Relevant development incentives, restrictions, exclusions or prohibitions	5
Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones	7
Proposed Development Area Environmental Sensitivity	7
Specialist assessments identified	8
Results of the environmental sensitivity of the proposed area	10
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY	10
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY	11
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY	12
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY	13
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY	14
MAP OF RELATIVE DEFENCE THEME SENSITIVITY	15
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY	16
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY	17
MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY	18

Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	LEEUWKUIL	76	0	26°57'44.95S	27°30'16.29E	Farm
2	WINDDAM	435	0	26°59'27.38S	27°30'36.97E	Farm
3	LEEUWKUIL	76	4	26°57'54.26S	27°30'0.05E	Farm Portion
4	LEEUWKUIL	76	0	26°58'10.6S	27°29'52.83E	Farm Portion
5	WINDDAM	435	0	26°59'27.38S	27°30'36.97E	Farm Portion

Development footprint¹ vertices:

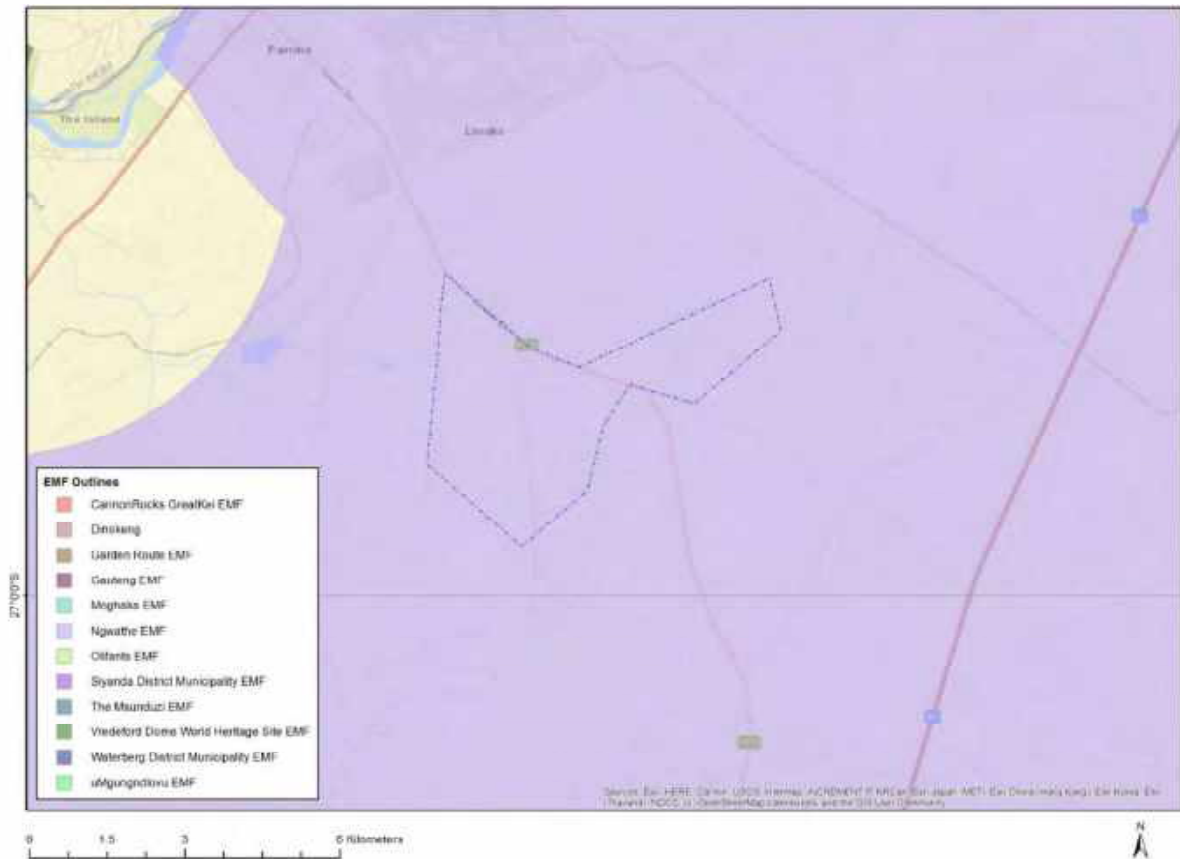
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

¹ “development footprint”, means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application



Environmental Management Framework	LINK
Ngwathe EMF	https://screening.environment.gov.za/ScreeningDownloads/EMF/Ngwathe_EMF_SummaryReport.pdf

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is: **Agriculture_Forestry_Fisheries | Crop Production.**

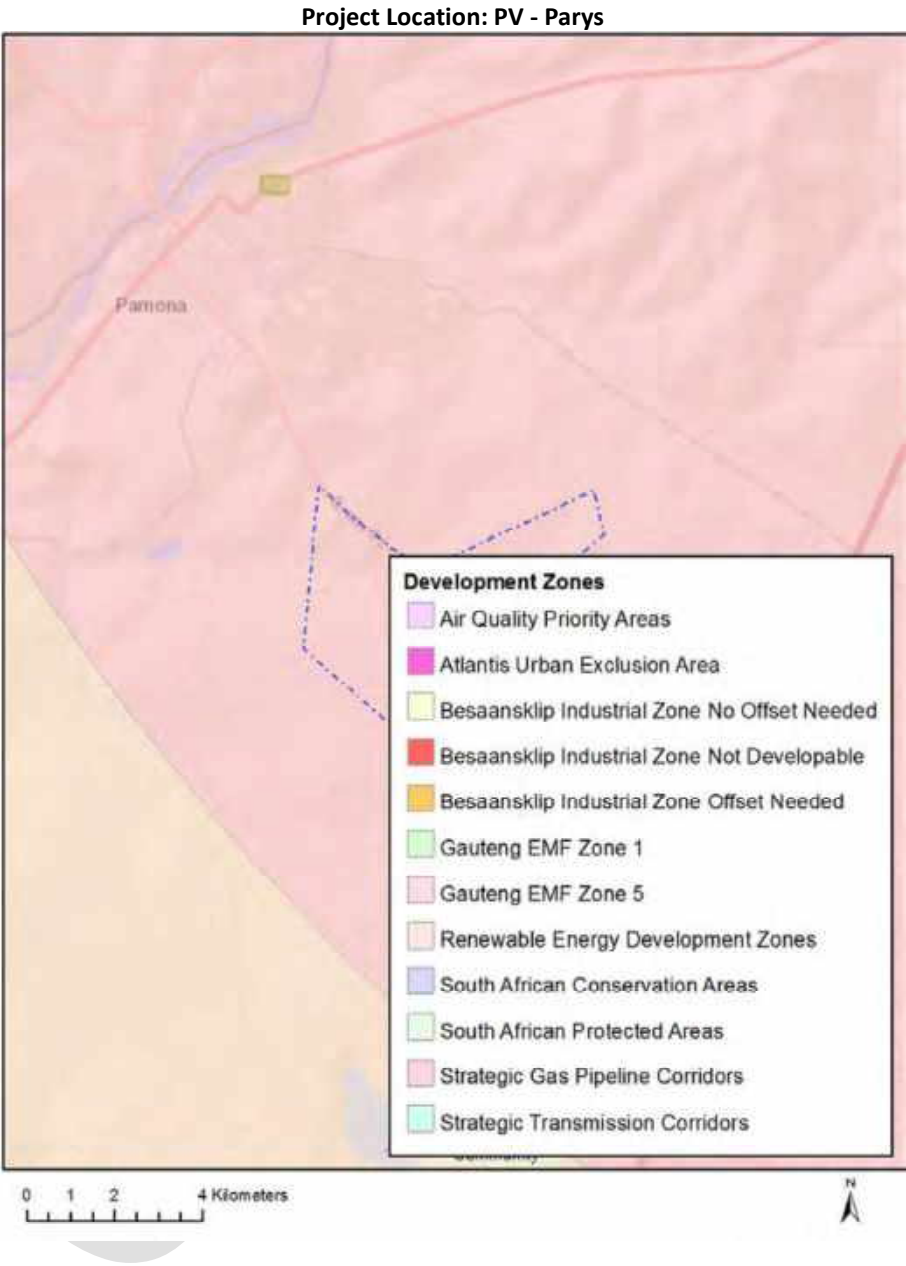
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentiv	Implication
----------	-------------

e, restrictio n or prohibiti on	
Strategic Transmissi on Corridor- Central corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_EGI.pdf
Renewable energy developme nt zones 10- Klerksdorp	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_REDZ.pdf
Strategic Gas Pipeline Corridors- Phase 3: Richards Bay to Gauteng	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_GAS.pdf

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme			X	

Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

N o	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
5	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
6	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
7	Hydrology	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols

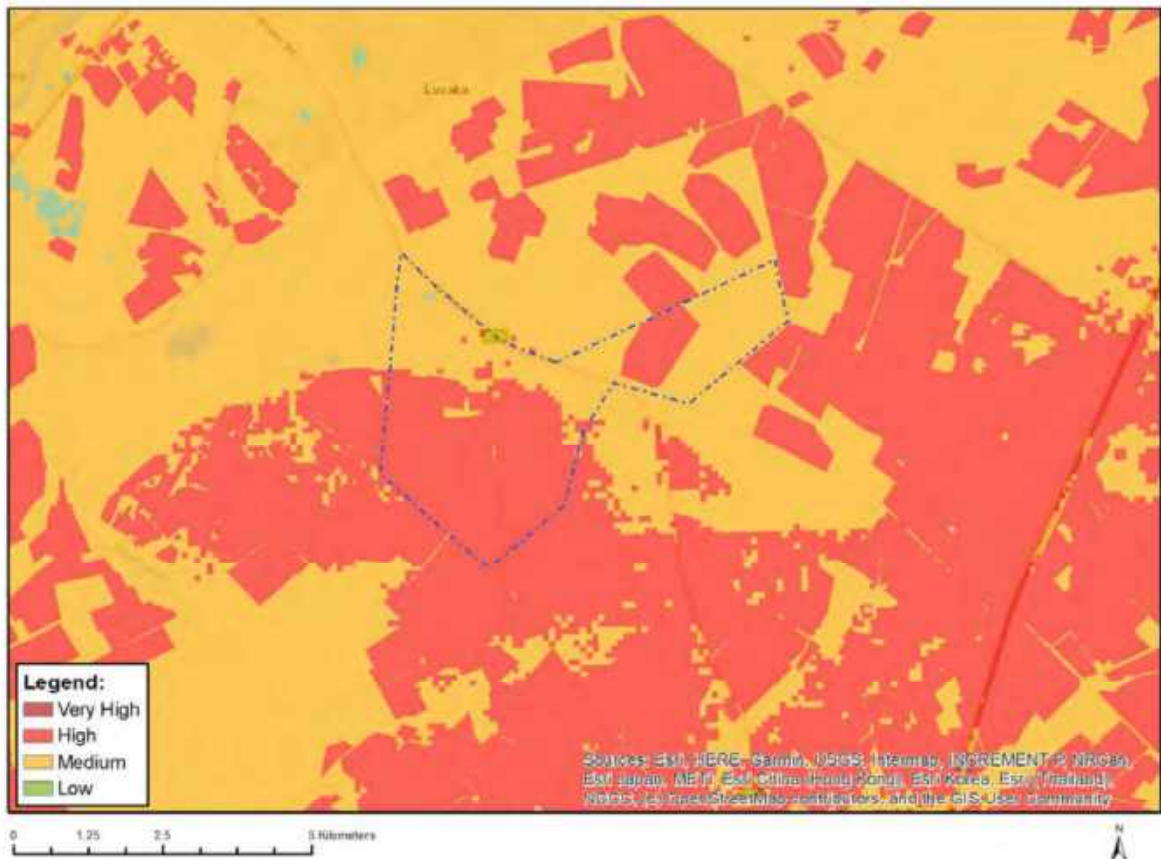
	Assessment	/Gazetted_General_Requirement_Assessment_Protocols.pdf
8	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
9	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
10	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf

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Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;09. Moderate-High/10. Moderate-High
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate