Pedology Scoping Report for the Pixley Park Renewable Energy Project – Wagt Solar Photovoltaic (PV) Energy Facility

De Aar, Northern Cape

February 2022

CLIENT

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

Report Name	**Pedology Scoping Report for the Pixley Park Renewable Energy Project – Wagt Solar Photovoltaic (PV) Energy Facility**
Reference	**Wagt Solar Photovoltaic Energy Facility**
Submitted to	savannah environmental
Report Writer	**Ivan Baker** Ivan Baker is Pr. Sci Nat registered (119315) in environmental science with Cand. Sci. Nat recognition in geological science. Ivan is a wetland and soil specialist with vast experience in wetlands, pedology, hydropedology and land contamination and has completed numerous specialist studies ranging from basic assessments to EIAs. Ivan has carried out various international studies following FC standards. Ivan completed training in Tools for Wetland Assessments with a certificate of competence and completed his MSc in environmental science and hydropedology at the North-West University of Potchefstroom. Ivan is also affiliated with the Fertiliser Society of South Africa after the acquiring a certificate of competence following the completion of the FERTASA training course.
Report Writer / Reviewer	**Andrew Husted** Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

DECLARATION

I, Ivan Baker, declare that:

- I act as the independent specialist in this application;
- I will perform 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;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Ivan Baker

Pedologist

The Biodiversity Company

February 2022

Table of Contents

List of Tables

List of Figures

1 Introduction

The Biodiversity Company was appointed by Savannah Environmental (Pty) Ltd (Savannah) to undertake a pedology scoping level assessment for the Pixley Park Renewable Energy project. The Pixley Park Solar Cluster Project comprises of photovoltaic (PV) facilities and associated powerlines, substations and BESS facilities.

The Pixley Park Solar Cluster Project will include the construction and operation of a photovoltaic (PV) solar energy facilities and associated infrastructure, located approximately 12 km east of De Aar, Northern Cape Province.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the published Government Notices (GN) 320 in terms of NEMA, dated 20 March 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" (Reporting Criteria).

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities at a scoping level, enabling informed decision making.

1.1 Background

Wagt Solar PV1 (Pty) Ltd is proposing the development of a Photovoltaic (PV) Solar Energy Facility and associated infrastructure on Farm Wag 'n Bietjie Annex C 137 and Farm Wag 'n Bietjie No. 5 located approximately 10km east of De Aar within the Emthanjeni Local Municipality in the Northern Cape Province. The facility will have a contracted capacity of up to 100MW and will be known as Wagt Solar PV1. The project is planned as part of a cluster of renewable energy facilities known as Pixley Park, which includes three (3) additional 100MW Solar PV Facilities (Rietfontein Solar PV1, Carolus PV1, and Fontain Solar PV1), and grid connection infrastructure connecting the facilities to the existing Hydra Substation. The projects will all connect to the new Vetlaagte Main Transmission Substation (MTS) via the Wag 'n Bietjie MTS.

Infrastructure associated with the Solar PV Facility will include the following:

- Solar PV array comprising bifacial PV modules and mounting structures, using single axis tracking technology;
- Inverters and transformers;
- Cabling between the panels;
- Battery Energy Storage System (BESS);
- Laydown areas, construction camps, site offices;
- 12 m wide Access Road and entrance gate to the project site and switching station;
- 6 m wide internal distribution roads;

- Operations and Maintenance Building, Site Offices, Ablutions with conservancy tanks, Storage Warehouse, workshop, Guard House;
- Onsite 132 kV IPP Substation, including the HV Step-up transformer, and MV Interconnection building;
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the Main Transmission Substation (MTS) located on farms Vetlaagte and Wagt, which is to be handed back to Eskom (a separate EA is being applied for in this regard);
- Extension of the 132kV Busbar at the MTS;
- 132kV Feeder Bay at the MTS;
- Extension of the 400kV Busbar at the MTS; and
- Installation of a new 400/132 kV Transformer and bay at the MTS.

A development footprint of approximately 737ha has been identified within the broader project site (approximately 8 200ha in extent), by the developer for the development of the Wagt Solar PV1 Facility, which is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes.

It is the developer's intention to bid the proposed project under the Department of Mineral Resources and Energy's (DMRE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme (or similar programme), with the aim of evacuating the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP), with Wagt Solar PV1 set to inject up to 100MW into the national grid.

1.2 Scope of Work

The principle aim of the assessment was to provide information to determine any level of risk posed by the proposed in regard to local soil attributes. This was achieved through the following:

- A desktop assessment of all relevant national and provincial datasets. If available, municipal datasets were also considered;
- Completion of a desktop level impact assessment with supporting mitigation measures;
- Presentation of specialist Terms of Reference (ToR) for the impact phase of the process.

1.3 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment has only been completed at a desktop level. It is assumed all datasets and information considered for the assessment is representative of the area and is well suited for the intended purposes of this scoping report;
- This assessment has only considered pedological resources; and

- No decommissioning phase impacts have been considered for this project. The life of operation is unknown and expected for perpetuity.

1.4 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements relevant to biodiversity and conservation in the Northern Cape Province

Region	Legislation / Guideline
International	Constitution of the Republic of South Africa (Act No. 108 of 1996)
	The Convention on Wetlands (RAMSAR Convention, 1971)
	The United Nations Framework Convention on Climate Change (UNFCC,1994)
National	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GN 320 of Government Gazette 43310 (March 2020)
	The Environment Conservation Act (Act No. 73 of 1989)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Water Act (NWA) (Act No. 36 of 1998)
	Municipal Systems Act (Act No. 32 of 2000)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
Provincial	Northern Cape Nature Conservation act no. 9 of 2009
	Northern Cape Planning and Development Act no. 7 of 1998

1.4.1 National Environmental Management Act (NEMA, 1998)

The National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations, as amended in April 2017, state that prior to certain listed activities taking place, an environmental authorisation application (EA) process needs to be followed. This could follow either the Basic Assessment (BA) process or the EIA process, depending on the scale of the impact. An EIA process will be undertaken for the project.

GN 350 was gazetted on the 20 March 2020, which has replaced the requirements of Appendix 6 of the EIA Regulations in respect of certain specialist reports. These regulations provide the criteria and minimum requirements for specialist's assessments, in order to consider the impacts on soil for activities which require EA.

2 Receiving Environment

The project area is located approximately 12 km east of De Aar, immediately north-east of the hydra substation and approximately 8 km north of the N10 Highway. The surrounding land uses predominantly include farming (grazing), mountainous areas and watercourses (predominantly non-perennial and ephemeral) (see Figure 2-1).

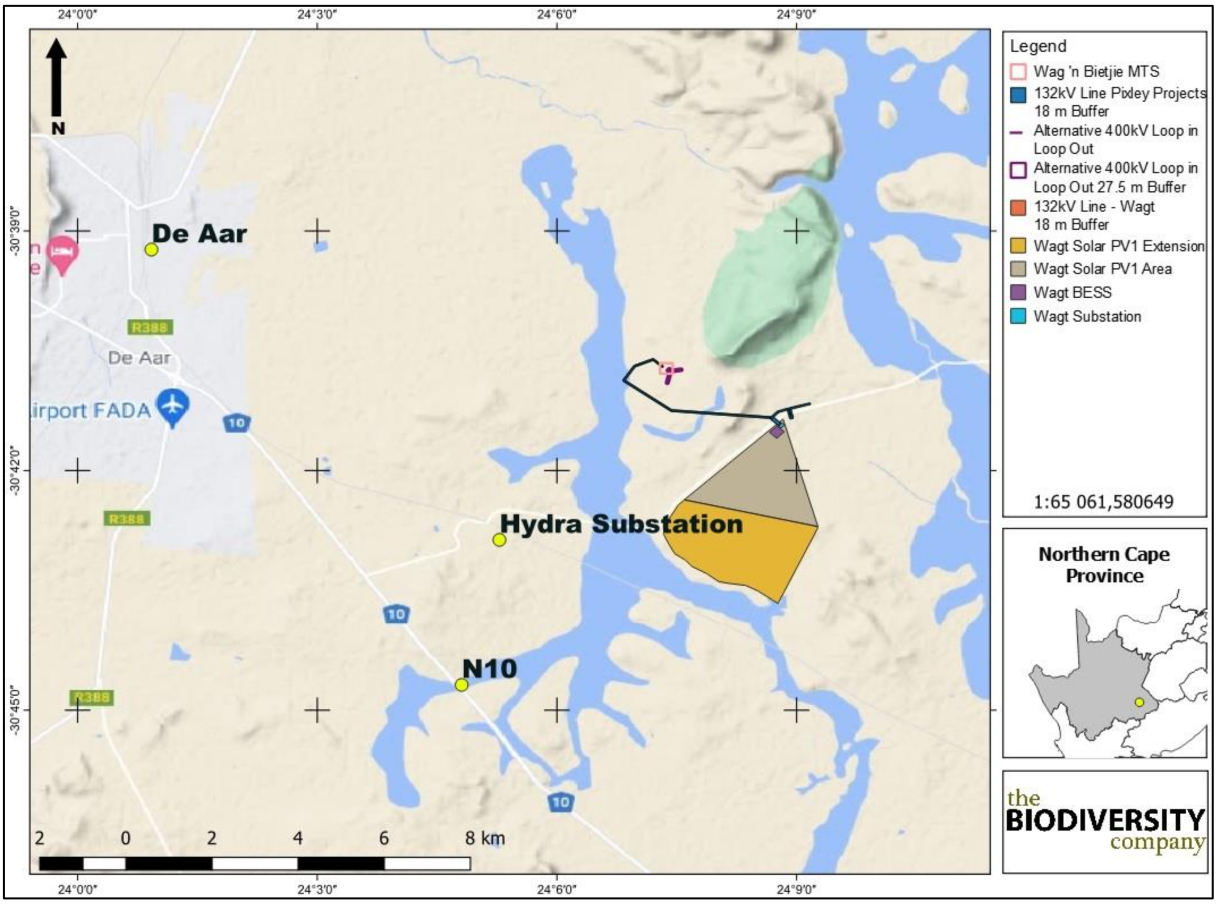

Figure 2-1 The location of the project area in relation to the general setting

2.1 Land Capability

As part of the desktop assessment, soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises of the division of land into land types. In addition, a Digital Elevation Model (DEM) as well as the slope percentage of the area was calculated.

2.2 Climate

This region's rainfall peaks during autumn months, especially March. The Mean Annual Precipitation (MAP) ranges from 190 to 400 mm with the mean minimum and maximum monthly temperatures for Britstown being -3.6℃ and 37.9℃ for July and January respectively (also see Figure 2-2 for more information).

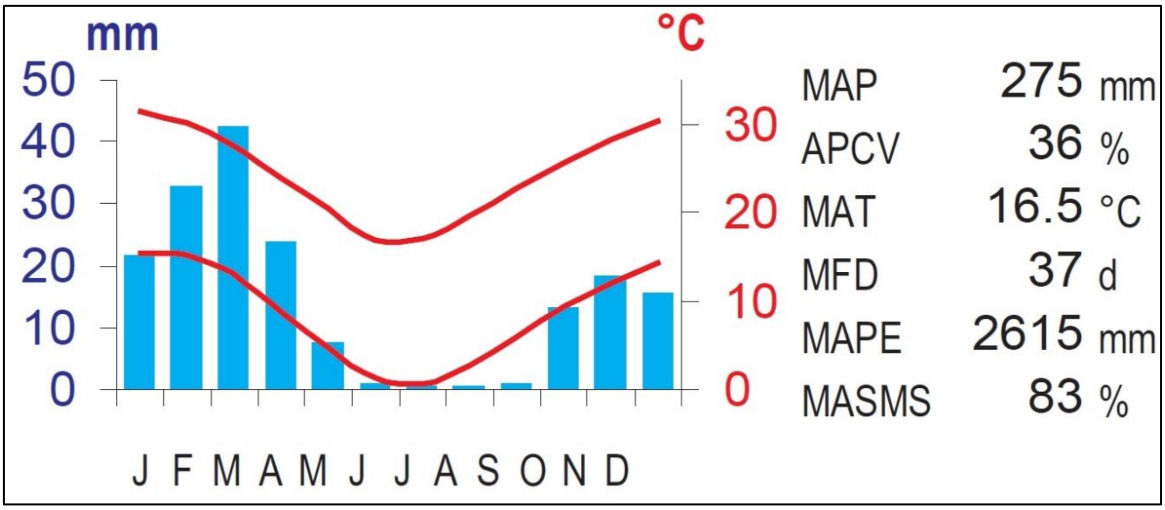

Figure 2-2 Climate for the region

2.3 Geology and Soil

The geology of this area is characterised by the Volksrust Formation shales as well as the Prince Albert Formation and the Dwyka Group diamictites (Mucina and Rutherford, 2006). The Jurassic Karoo Dolerite sills and sheets support the vegetation in this area soils varying from shallow to deep. Red and yellow-brown apedal soils are common in this region with the Ae, Fc and Ag land types prominently featuring.

According to the land type database (Land Type Survey Staff, 1972 - 2006), the project area is characterised by the Ae 137, 138 and 140 as well as the Ib 47 and Fb 73 land types (see Figure 2-3). The Ae land type consists of red-yellow apedal soils which are freely drained. The soils tend to have a high base status and is deeper than 300 mm. The Fb land type consists of Glenrosa and/or Mispah soil forms with the possibility of other soils occurring throughout. Lime is generally present within the entire landscape. The Ib land type consists of miscellaneous land classes including rocky areas with miscellaneous soils.

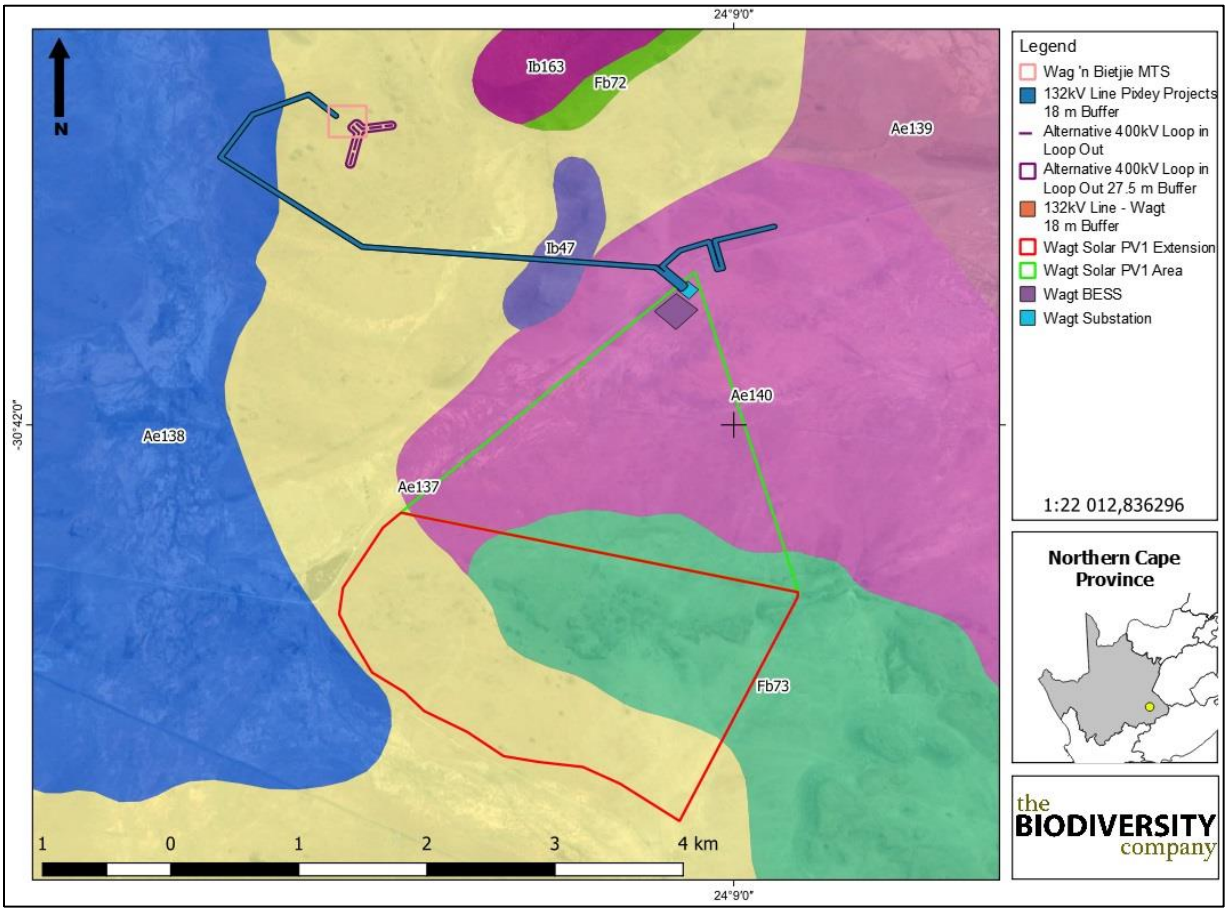

Figure 2-3 Land Types present within the project area

The land terrain units for the featured land types are illustrated from Figure 2-4 and Figure 2-8 with the expected soils illustrated in Table 2-1 to Table 2-5.

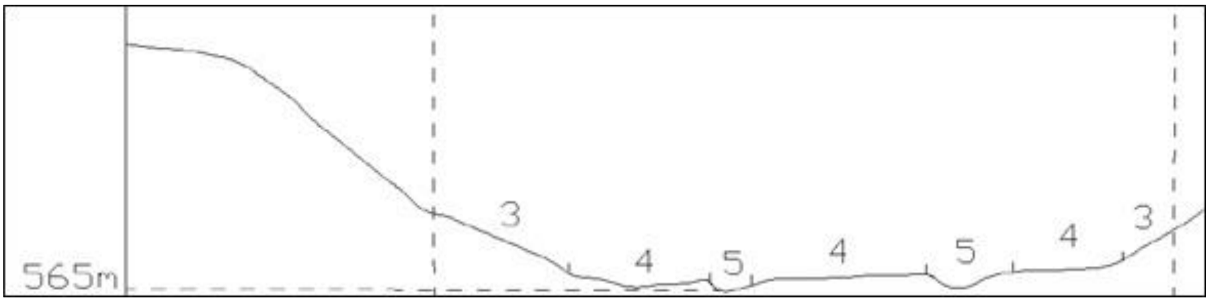

Figure 2-4 Illustration of the Ae 137 land type terrain units (Land Type Survey Staff, 1972 - 2006)

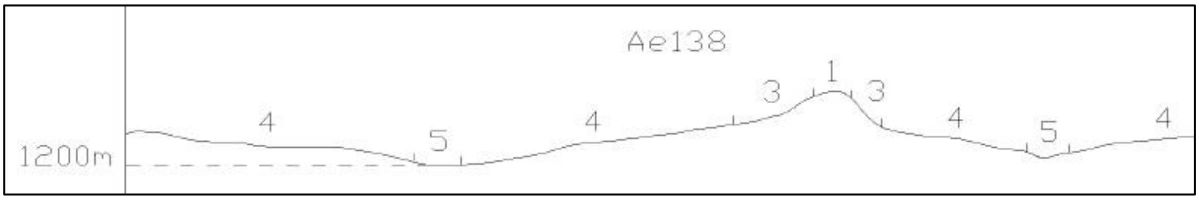

Figure 2-5 Illustration of the Ae 138 land type terrain units (Land Type Survey Staff, 1972 - 2006)

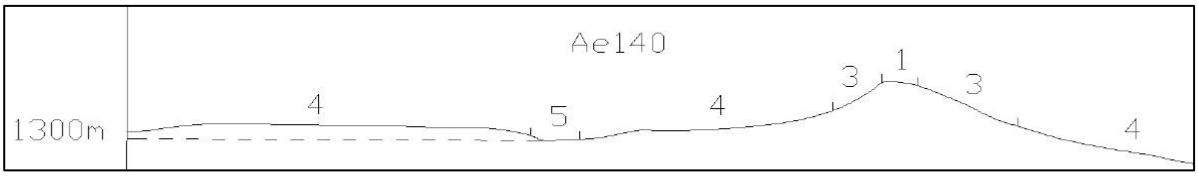

Figure 2-6 Illustration of the Ae 140 land type terrain units (Land Type Survey Staff, 1972 - 2006)

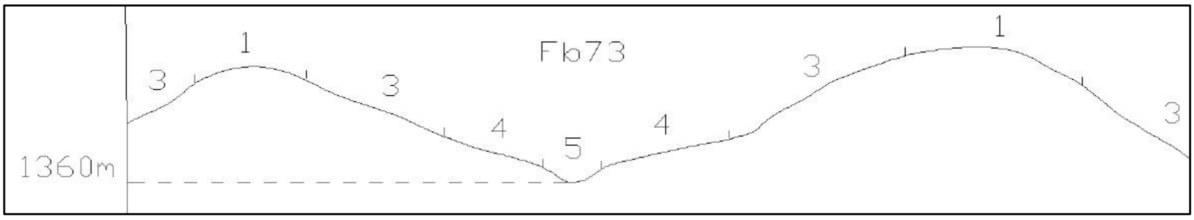

Figure 2-7 Illustration of land type Fb 73 terrain unit (Land Type Survey Staff, 1972 - 2006)

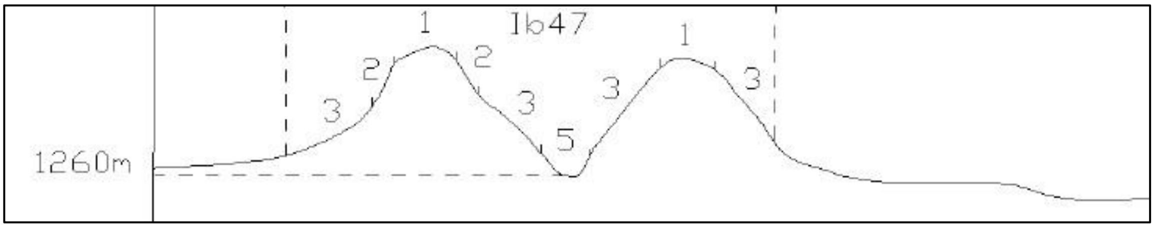

Figure 2-8 Illustration of land type Ib 47 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 2-1 Soils expected at the respective terrain units within the Ae 137 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (30%)		**3 (55%)**		**4 (10%)**		**5 (5%)**	
Hutton	72%	Hutton	75%	Hutton	63%	Oakleaf	53%
Mispah	15%	Mispah	13%	Swartland	15%	Valsrivier	30%
Swartland	10%	Swartland	10%	Mispah	10%	Hutton	5%
Bare Rock	3%	Clovelly	3%	Valsrivier	5%	Swartland	5%
				Oakleaf	5%	Clovelly	5%
				Clovelly	2%	Streambeds	2%

Table 2-2 Soils expected at the respective terrain units within the Ae 138 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (3%)		**3 (20%)**		**4 (75%)**		**5 (2%)**	
Bare Rock	40%	Hutton	70%	Hutton	85%	Oakleaf	40%
Hutton	30%	Mispah	15%	Mispah	10%	Swartland	25%
Mispah	30%	Swartland	10%	Swartland	5%	Valsrivier	20%
		Mispah	5%			Hutton	10%
						Streambeds	5%

Table 2-3 Soils expected at the respective terrain units within the Ae 140 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (2%)		3 (8%)		4 (85%)		5 (5%)	
Bare Rock	75%	Mispah	30%	Hutton	55%	Oakleaf	45%
Glenrosa	10%	Hutton	20%	Swartland	30%	Glenrosa	35%
Mispah	5%	Bare Rock	20%	Mispah	5%	Swartland	10%
Hutton	5%	Glenrosa	20%	Valsrivier	5%	Streambeds	5%
Swartland	5%	Swartland	10%	Glenrosa	5%	Hutton	5%

Table 2-4 Soils expected at the respective terrain units within the Fb 72 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (25%)		3 (65%)		4 (5%)		5 (5%)	
Mispah	50%	Mispah	30%	Mispah	45%	Valsrivier	30%
Bare Rock	20%	Glenrosa	20%	Swartland	25%	Mispah	30%
Glenrosa	15%	Hutton	20%	Hutton	15%	Oakleaf	25%
Hutton	10%	Swartland	15%	Bare Rock	5%	Glenrosa	10%
Swartland	5%	Bare Rock	15%	Glenrosa	5%	Swartland	3%
				Valsrivier	3%	Streambeds	2%
				Oakleaf	2%		

Table 2-5 Soils expected at the respective terrain units within the Ib 47 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (5%)		2 (3%)		3 (90%)		5 (2%)	
Bare Rock	80%	Bare Rock	100%	Bare Rock	65%	Mispah	50%
Mispah	10%			Mispah	15%	Bare Rock	30%
Glenrosa	5%			Shortlands	10%	Glenrosa	20%
Hutton	3%			Glenrosa	5%		
Shortlands	2%			Hutton	5%		

2.4 Terrain

The slope percentage of the project area has been calculated and is illustrated in Figure 2-9. Most of the project area is characterised by a slope percentage between 0 and 10%, with some smaller patches within the project area characterised by a slope percentage in excess of 65%. This illustration indicates a non-uniform topography with alternating hills and steep cliffs surrounding flatter areas at high elevation. The DEM of the project area (Figure 2-10) indicates an elevation between 1 250 to 1 350 Metres Above Sea Level (MASL).

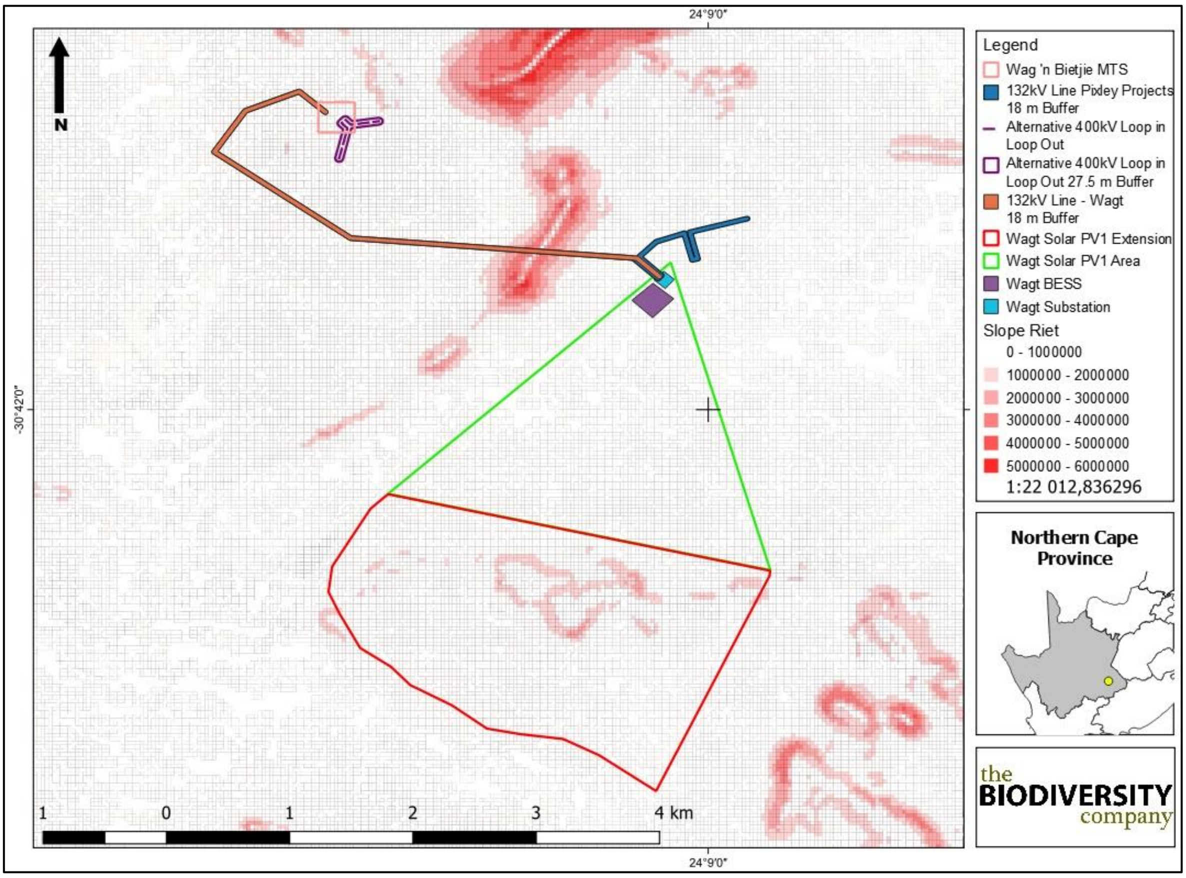

Figure 2-9 ***The slope percentage calculated for the project area***

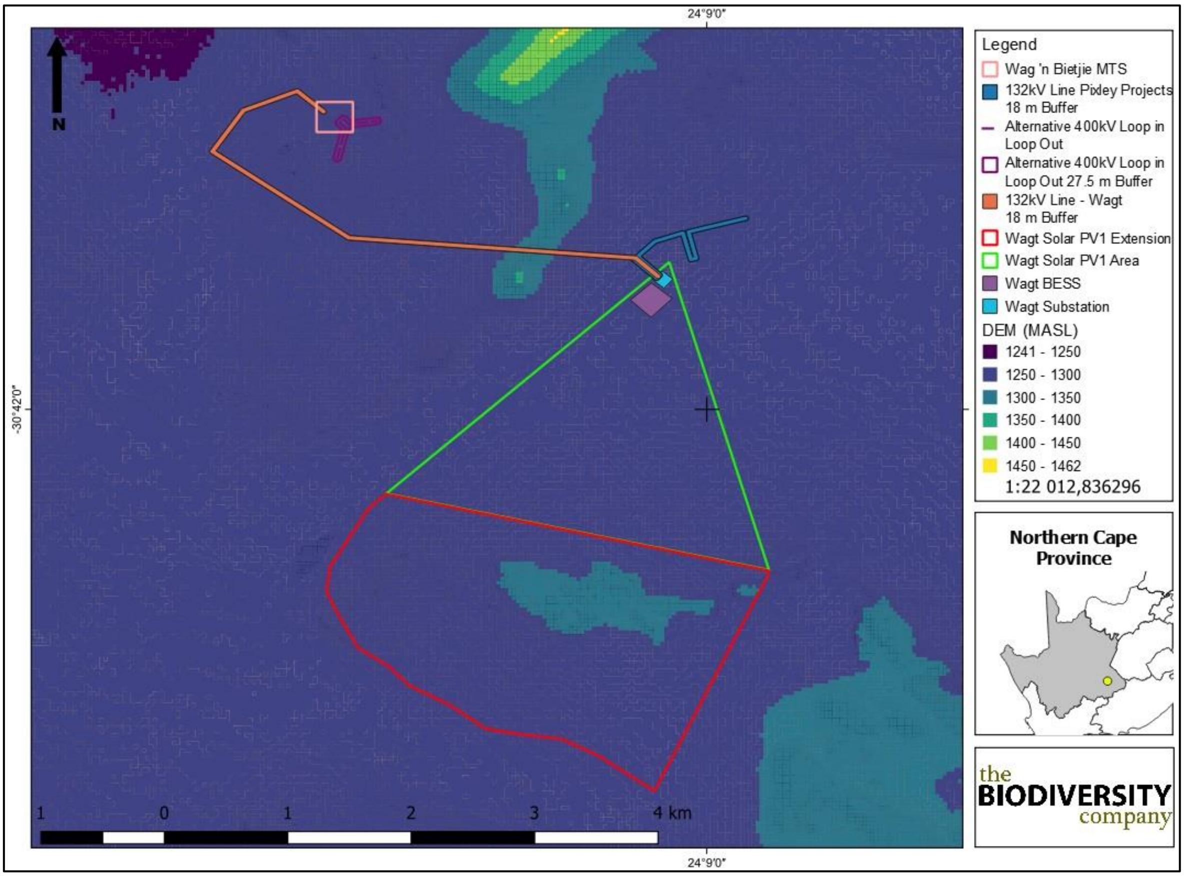

Figure 2-10 ***The DEM generated for the project area***

2.5 Sensitivity

According to DAFF (2017), eight land capability classes were identified throughout the project area (Figure 2-11). These land capability classes are classified as having "Very Low to "Low" (land capability classes 1 to 5) sensitivities with the land capability classes 6 to 8 regarded as having "Moderately Low to "Moderate" sensitivities. Additionally, crop boundaries were identified to the east of the proposed PV area which is characterised by a "High" sensitivity. This area will not be impeded on by the proposed activities.

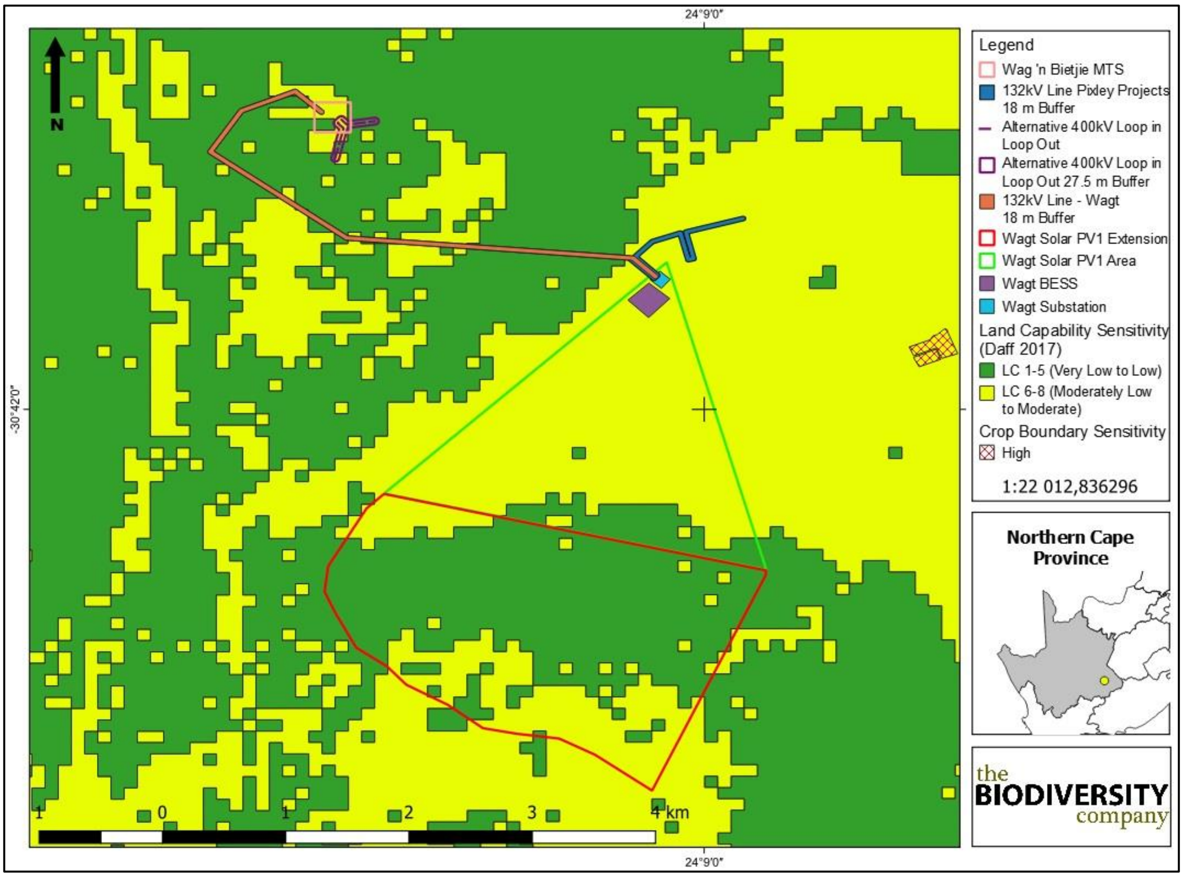

Figure 2-11 Land capability sensitivities of the project area (DAFF, 2017)

3 Terms of Reference

3.1 Land Capability

Land capability and agricultural potential will be determined by a combination of soil, terrain and climate features. Land capability is defined by the most intensive long-term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes.

Land capability is divided into eight classes and these may be divided into three capability groups. Table 3-1 shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use and sensitivity increases from class I to class VIII (Smith, 2006).

Table 3-1 Land capability class and intensity of use (Smith, 2006)

Land Capability Class	Increased Intensity of Use									Land Capability Groups
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	F	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife
W - Wildlife		**MG - Moderate Grazing**			**MC - Moderate Cultivation**					
F- Forestry		**IG - Intensive Grazing**			**IC - Intensive Cultivation**					
LG - Light Grazing		**LC - Light Cultivation**			**VIC - Very Intensive Cultivation**					

Land capability has been classified into 15 different categories by the DAFF (2017) which indicates the national land capability category and associated sensitivity related to soil resources.

The land potential classes are determined by combining the land capability results and the climate capability of a region as shown in Table 3-2. The final land potential results are then described in Table 3-3. These land potential classes are regarded as the final delineations subject to sensitivity, given the comprehensive addition of climatic conditions as those relevant to the DAFF (2017) land capabilities. The main contributors to the climatic conditions as per Smith (2006) is that of MAP, Mean Annual Potential Evaporation (MAPE), mean September temperatures, mean June temperatures and mean annual temperatures. These parameters will be derived from Mucina and Rutherford (2006) for each vegetation type located within a relevant project area. This will give the specialist the opportunity to consider micro-climate, aspect, topography etc.

Table 3-2 The combination table for land potential classification

Land capability class	Climate capability class							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 3-3 The Land Potential Classes.

Land potential	Description of land potential class
L1	Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures or rainfall. Non-arable

3.2 Climate Capability

According to Smith (2006), climatic capability is determined by taking into consideration various steps pertaining to the temperature, rainfall and Class A-pan of a region. The first step in this methodology is to determine the MAP to Class A-pan ratio.

Table 3-4 Climatic capability (step 1) (Smith, 2006)

Climatic Capability Class	Limitation Rating	Description	MAP: Class A pan Class
C1	None to Slight	Local climate is favourable for good yields for a wide range of adapted crops throughout the year.	0.75-1.00
C2	Slight	Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperature increase risk and decrease yields relative to C1.	0.50-0.75
C3	Slight to Moderate	Slightly restricted growing season due to the occurrence of low temperatures and frost. Good yield potential for a moderate range of adapted crops.	0.47-0.50
C4	Moderate	Moderately restricted growing season due to the occurrence of low temperatures and severe frost. Good yield potential for a moderate range of adapted crops but planting date options more limited than C3.	0.44-0.47
C5	Moderate to Severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Suitable crops at risk of some yield loss.	0.41-0.44

C6	Severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Limited suitable crops that frequently experience yield loss.	0.38-0.41
C7	Severe to Very Severe	Severely restricted choice of crops due to heat and moisture stress.	0.34-0.38
C8	Very Severe	Very severely restricted choice of crops due to heat and moisture stress. Suitable crops at high risk of yield loss.	0.30-0.34

In the event that the MAP: Class A-pan ratio is calculated to fall within the C7 or C8 class, no further steps are required, and the climatic capability can therefore be determined to be C7 or C8. In cases where the above-mentioned ratio falls within C1-C6, steps 2 to 3 will be required to further refine the climatic capability.

Step 2

Mean September temperatures;

- <10℃ = C6
- 10 - 11℃ = C5
- 11 - 12℃ = C4
- 12 - 13℃ = C3
- >13℃ = C1

Step 3

Mean June temperatures;

- <9℃ = C5
- 9 - 10℃ = C4
- 10 - 11℃ = C3
- 11 - 12℃ = C2

3.3 Current Land Use

A generalised land-use will be derived for the larger project area considering agricultural productivity.

- Mining;
- Bare areas;
- Agriculture crops;
- Natural veld;
- Grazing lands;
- Forest;
- Plantation;
- Urban;
- Built-up;
- Waterbodies; and
- Wetlands.

4 Impact Assessment

Figure 4-1 presents the layout for the proposed facility, which has been considered for the scoping level impact assessment. This assessment has considered both direct and indirect risks to land potential resources.

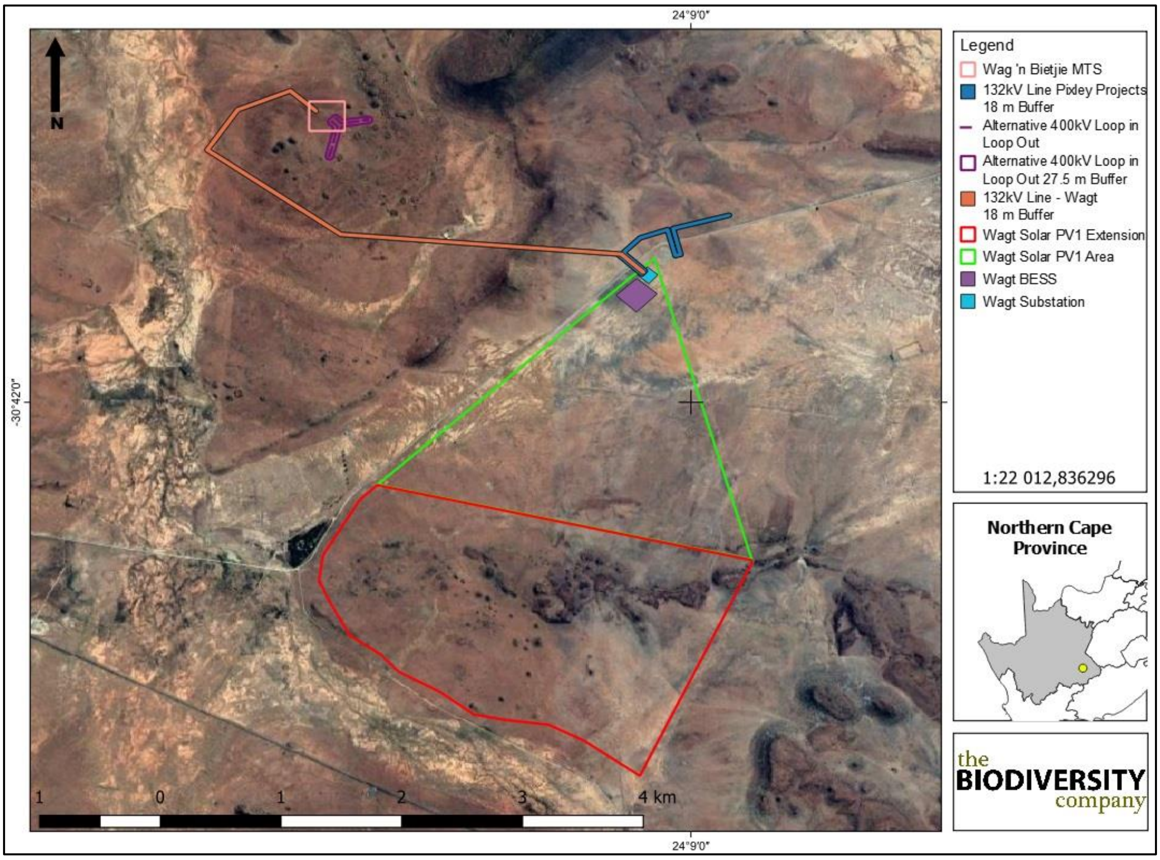

Figure 4-1 The layout for the proposed facility

4.1 Impact Assessment Method

The assessment of the significance of direct, indirect and cumulative impacts was undertaken using the method as developed by Savannah. The assessment of the impact considers the following, the:

- Nature of the impact, which shall include a description of what causes the effect, what will be affected, and how it will be affected;
- Extent of the impact, indicating whether the impact will be local or regional;
- Duration of the impact, very short-term duration (0-1 year), short-term duration (2-5 years), medium-term (5-15 years), long-term (> 15 years) or permanent;
- Probability of the impact, describing the likelihood of the impact actually occurring, indicated as improbable, probable, highly probable or definite;
- Severity/beneficial scale, indicating whether the impact will be very severe/beneficial (a permanent change which cannot be mitigated/permanent and significant benefit with no real alternative to achieving this benefit); severe/beneficial (long-term impact that could be mitigated/long-term benefit); moderately severe/beneficial (medium- to long-term impact that could be mitigated/ medium- to long-term benefit); slight; or have no effect;

- Significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low medium or high;
- Status, which will be described as either positive, negative or neutral;
- Degree to which the impact can be reversed;
- Degree to which the impact may cause irreplaceable loss of resources; and
- Degree to which the impact can be mitigated.

4.2 Soil Impact Assessment

Considering the occurrence of various soil forms that are commonly associated with high land capabilities, it is likely that areas with high land capability sensitivity do occur within the project area. However, due to the poor climatic capability, the ultimate land potential is more likely to be low.

Table 4-1 Scoping evaluation table summarising the impacts identified to soils

<table>
<tr><td colspan="4">Impact
Loss of land capability</td></tr>
<tr><th>Issue</th><th>Nature of Impact</th><th>Extent of Impact</th><th>No-Go Areas</th></tr>
<tr><td>Compaction/soil stripping/transformation of land use which leads to loss of land capability</td><td><u>Direct impacts:</u>
» Loss of soil / land capability
<u>Indirect impacts:</u>
» Loss of land capability</td><td>Regional</td><td>None identified at this stage</td></tr>
<tr><td colspan="4">Description of expected significance of impact
The development of the area could result in the encroachment into areas characterised by high land potential properties, which can ultimately result in the loss of land capability. These disturbances could also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. Earthworks will expose and mobilise earth materials which could result in compaction and/or erosion. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages or breakages from any of these could result in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants. During the operational phase, the impacts associated with the substation and collector sub will be easily managed by best “housekeeping” practices.</td></tr>
<tr><td colspan="4">Gaps in knowledge & recommendations for further study
» This is completed at a desktop level only.
» Identification and delineation of soil forms.
» Determine of soil sensitivity.

Recommendations with regards to general field surveys
» Field surveys to prioritise the development areas.</td></tr>
</table>

4.2.1 Cumulative Impacts

Cumulative impacts are assessed in context of the extent of the proposed project area; other developments in the area; and general loss of high-quality land capability areas. The anticipated post-mitigation risk significance is expected to be low, and the overall cumulative impact is therefore expected to be low. Cumulative impacts are assessed in context of the extent of the proposed project area; other developments in the area; and general loss of high-quality land capability areas. The expected post-mitigation risk significance for the project in isolation is expected to be low, but in consideration of the larger Pixley Park Solar Cluster Project, the overall cumulative impact is expected to be medium.

Table 4-2 Cumulative soil impact assessment

Impact Nature: Loss of land capability		
General degradation of soil resources		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Low (2)	Moderate (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**Low**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Residual Impacts:		
Unlikely considering the adherence to recommendations and mitigations		

5 Conclusion

5.1 Land Capability

Various soil forms are expected throughout the project area, of which some are commonly associated with high land capabilities. Even though the soil depth, texture and permeability of these soils ensure high land capability, the climatic capability of the area often reduces the land potential considerably. Therefore, very few areas characterised by "High" land potential is expected.

Considering the lack of sensitivity, together with holistic mitigation measures, it has been determined that none of the aspects scored during the impact assessment (post-mitigation) are associated with any scores higher than "Low". It is recommended that the site assessment to be conducted for focus areas that potentially are characterised by greater micro-climates (i.e. aspect) and low laying areas characterised by deep soils.

6 References

Land Type Survey Staff. (1972 - 2006). Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases. Pretoria: ARC-Institute for Soil, Climate, and Water.

Mucina, L. & Rutherford, M.C. (Eds.). (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

Smith, B. (2006). The Farming Handbook. Netherlands & South Africa: University of KwaZulu-Natal Press & CTA.

Soil Classification Working Group. (1991). Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

Soil Classification Working Group. (2018). Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.