Rehab Green cc
Registration No: 2002/094339/23

PI Steenekamp
PO Box 12636
Queenswood
0121
Pretoria

Cell: 082 560 0592
Fax: 086 678 1690
E-mail: rehabgreen@ee-sa.com

Report No: RG/2022/06/14/1
Date: 17 August 2022
Status: Revision 1

SPECIALIST REPORT

Combined Screening Tool verification and Agricultural Agro-ecosystem Specialist Assessment of the proposed Sibanye Photovoltaic Facility situated on the farm Uitval near Westonaria, Gauteng Province

Requested By

Zutari (Pty) Ltd

Compiled By

Rehab Green Monitoring Consultants CC
Environmental and Rehabilitation Monitoring Consultant cc
P.I. Steenekamp (Cert.Sci.Nat.)

Abbreviated Curriculum Vitae

Name:	Petrus Ignatius Steenekamp
Date of birth:	1968-02-11
Email:	piet@rehabgreen.co.za
Qualification:	N.Dip: Agricultural Resource Utilization, 1992
Professional affiliations:	Soil Science Society of South Africa South African Council for Natural Scientific Professions
Professional career:	1991-2004 Institute for Soil Climate and Water 2004-2021 Principal consultant of Rehab Green Monitoring Consultants cc
Experience:	30 years experience in: - pre-mining soil and land capability classification, mapping and impact assessments; - Post-mining rehabilitated soil and land capability assessments; - Pre-mining soil stripping plans and procedures for optimal rehabilitation and post-mining land capability achievements. - Pre- and post-mining soil fertility assessments for re-vegetation and fertilizer application purposes. - Agricultural Agro-ecosystem assessments - GIS surface analyses and map compilations.

Declaration of Professional Registration

I, Piet Steenekamp, hereby declare that I am registered at The South African Council for Natural Scientific Professions (Reg. No. 200032/04) as a Certificated Natural Scientist in terms of section 20(3)(c) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) in the following field of practice (Schedule 1 of the Act): Soil Science.

Declaration of Independence

I, Piet Steenekamp (ID 680211 5009 08 9), hereby declare that I have no conflict of interest related to the work of this report. Specially, I declare that I have no personal financial interests in the property and/or development being assessed in this report, and that I have no personal or financial connections to the relevant property owners, developers, planners, financiers or consultants of the development. I declare that the opinions expressed in this report are my own and a true reflection of my professional expertise.

P.I. Steenekamp

CONTENTS

REFERENCES

TABLES:

PHOTOS:

FIGURES:

APPENDICES:

1. INTRODUCTION

NB! This report is a combination of 2 reports required by the Agricultural Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Agricultural Resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more (the Protocol). The Protocol is provided in Appendix F.

The 2 reports required by the Protocol are:

- An Agricultural Sensitivity Verification report that contains a verification of the correctness of the National web-based Screening Tool sensitivity ratings; and based on the outcome
- An Agricultural Compliance Statement Report; **or**
- An Agricultural Agro-ecosystem Assessment Report

The first report is a high level verification of the sensitivity of the site and the second report is always based on the finding of the first report. Combining the 2 reports provides a clear understanding of the requirements that lead to the aspects being addressed and prevent uncertainties when either one of them is red without having the other one at hand.

1.1 Project background

Sibanye Gold is planning to develop a large scale ground-mounted solar photovoltaic (PV) facility near their Driefontein and Kloof mining operations in the southwest region of Gauteng. The aim with the planned 200MW facility is to feed into the electricity networks, offsetting the energy usage from their mining operations.

The proposed PV facility will require preferably a continuous footprint of approximately 730 ha. The plan is to construct the facility in 4 phases (Figure 4).

An initial site selection process was done by Sibanye Gold during 2016 and three possible sites were identified. After a site visit, Aurecon performed a multi-criteria analysis on these sites, involving various specialists, and a preferred site (Site 1) was identified.

An EIA process was followed in 2016 and an environmental authorization for a 200MW photovoltaic solar energy plant was granted in January 2017 on the preferred site.

A Basic Assessment process is currently followed to include Activity 28 of Listing 1 of the Environmental Impact Assessment Regulations, which was excluded during the initial EIA process. The activity involves Activity 28 of Listing Notice 1 as published under Notice No.327 in Government Gazette No. 40772, dated 4 April 2017 (subjected to corrections published under Notice No. 706 in Government Gazette No.41766, dated 13 July 2018) under sections 24(2), 24(5), 24D and 44 read with Section 47A (1) (b) of the National Environmental Management Act ,1998 (Act No.107 of 1998).

The activity include all residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 1 April 1998 and where such development:

(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or

(ii) (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;

excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.

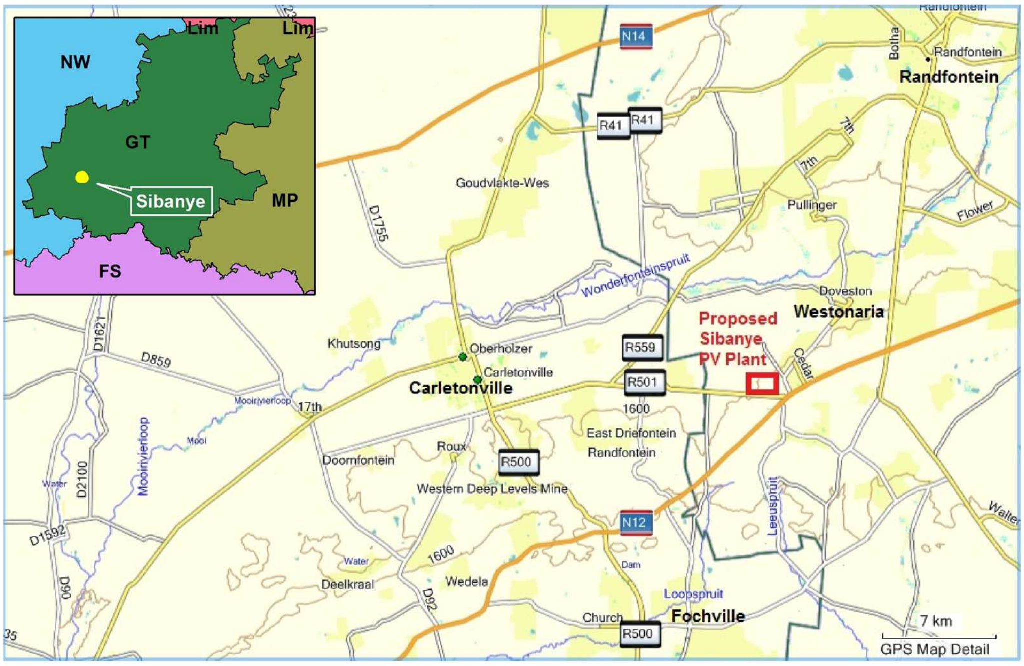
1.2 Terms of reference

Rehab Green Monitoring Consultants cc was contracted by Zutari (Pty) Ltd to conduct an Agricultural Agro-ecosystem specialist assessment of the preferred site, as required by current, applicable environmental legislation. The preferred site is referred to as "the development site" further in this report

1.3 Regional setting

The proposed PV facility footprint covers the majority of 5 portions of the farm Uitval 280IQ, situated in the southwest section of Gauteng province, approximately 10km southwest of Westonaria. Other towns in the vicinity are Carletonville to the west, Fochville to the south and Randfontein to the northeast (Figure 1).

Figure 1: Regional setting of the proposed Sibanye PV Plant



1.4 Applicable legislation

National Environmental Management Act (NEMA), Act 107 of 1998 and related Regulations as follows:

- Environmental Impact Assessment Regulations 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, in terms of sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and published on 29 May 2020 in Government Notice No 599.

- Regulation 16(1)(b)(v) - when submitted in terms of regulation 19 or 21, be accompanied by the report generated by the **national web based environmental screening tool**, once this tool is operational.
- Regulation 16(3)(a) - Any report, plan or document submitted as part of an application must comply with any **protocol** or minimum information requirements relevant to the application as identified and by the Minister in a government notice.
  - **Gazetted protocols** - Agriculture: protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more (Published in Government Notice No.320, Government Gazette 43110, 20 March 2020)

    (This protocol replaces the Specialist Assessment Reporting Requirements of Appendix 6 of the EIA Regulations)
- Regulation 17(c) - Upon receipt of an application, the competent authority must check whether the application — conforms to the requirements of these Regulations, any protocol or minimum information requirements relevant to the application as identified and *gazetted* by the Minister in a government notice or instructions or guidance provided by the competent authority to the submission of applications.
- Regulation 19 - Submission of basic assessment report and environmental management programme, and where applicable closure plan, to competent authority.

1.5 Scope of work

The scope of work is:

- To conduct an agricultural agro-ecosystem specialist assessment of the development site based on a detailed baseline evaluation, which involves a soil, land capability and current land use assessment.
- A detailed soil and agricultural potential assessment was done by Rehab Green Monitoring Consultants in 2016, Steenekamp 2016. Soil physical properties develop over thousands of years, and any physical variation that could take place since, are considered insufficient to require an updated soil assessment. Although the soil and related agricultural potential was evaluated in 2016, the agricultural sensitivity, which is a combination of soil potential and land use was not specifically evaluated and captured in a spatial format. In order to provide an accurate agricultural sensitivity evaluation, the site will have to be visited again and the current land uses and agricultural production yields will have to be verified.
- To provide a report that contains all baseline information and addresses all requirements of relevant environmental legislation and applicable protocols gazetted by a Minister in order to assist with decision making in terms of the environmental authorization of the proposed development.

1.6 Study aims and objectives

Based on the scope of work an agricultural agro-eco-system assessment need to be executed, which include a baseline assessment and the objectives were to:

- Execute a site sensitivity verification by means of the national web based screening tool;
- Conduct a baseline assessment to determine the status quo of the development site which entails:
  - A detailed soil assessment of the proposed development site, which includes soils forms, effective soil depth; top and subsoil clay percentage, internal drainage, terrain units and slope percentage (done in 2016);
  - Classify and map soil forms according to the South African Taxonomic Soil Classification System, 1991 (done in 2016);
  - Derive and map the soils agricultural potential based on soil properties, surface slope and climatic conditions (done in 2016);
  - Map all current land uses;
  - Derive potential agricultural yields based on soil properties and climatic conditions.
  - Verify current agricultural yields of combine data obtained from current farmer or land owner.
  - Map the current agricultural sensitivity of the development site based on gathered information and compare it to those of the Screening Tool;
  - Overlay the proposed development structures on the agricultural sensitivity map; and
  - Provide guidelines and procedures to minimize the impacts on agricultural resources and production;
- Determine the impact on agriculture in terms of:
  - The loss of agricultural land;
  - Change in agriculture productivity; and
  - Change in employment figures.
- Provide an opinion on the acceptability of the development in terms of agricultural resources and provide a recommendation on whether the development should be approved or not as specifically prescribed by minimum reporting requirements of the protocol.

2. METHODOLOGY

2.1 Screening Tool Report

The site sensitivity report for the development footprint was generated by means of the National web-based Screening Tool [Regulation 16(1)(b)(v)] and the report as well as applicable shapefiles was downloaded. The generated report is dated 20/07/2022 07:47:45 and the category used was Agriculture_Forestry_Fisheries/Crop Production.

2.2 Initial site sensitivity verification procedure

The Protocol requires an initial, high level verification of the accuracy of the sensitivity categories as rated by the Screening Tool. The Protocol state that prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the Screening Tool, must be confirmed by undertaking a site **sensitivity verification** as follows:

- The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist. The site sensitivity verification must be undertaken through the use of:
  - a desk top analysis, using satellite imagery;
  - a preliminary on-site inspection; and

- any other available and relevant information.

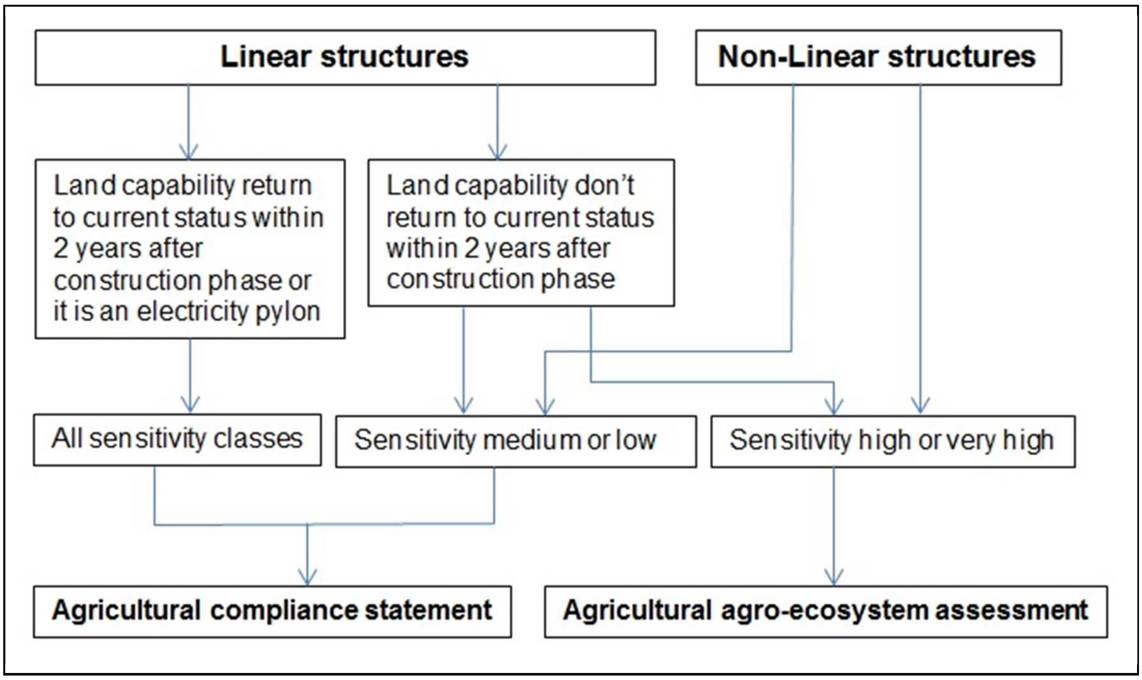
- The outcome of the site sensitivity verification must be recorded in the form of a report that:

  - confirms or disputes the current use of the land and the environmental sensitivity as identified by the Screening Tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
  - contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
  - is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

2.3 Specialist assessment level

Based on the sensitivity outcome and the type of structure, one of two levels of assessments needs to be undertaken, which is either an Agricultural Compliance Statement or an Agricultural Agro-ecosystem Assessment.

The following flow diagram indicates, based on the type of structure and verified agricultural sensitivity, which of the 2 assessments need to be done:



The Protocol then provides criteria and minimum reporting requirements for each of the 2 levels of assessments that are to be done. The Protocol is provided in Appendix F.

2.4 Baseline assessment

The baseline assessment was done in 2016 by means of the following procedures:

2.4.1 Soil assessment field procedures

Geographic Information System (GIS) software from Esri (Environmental Systems Research Institute) called ArcGIS-ArcMap was used to generate spatial data and to store and process field data for map compilations.

Field observation points were generated at a density of 150 x 150 m across the development site. The coordinates of the observation points were calculated and loaded on a Geographic Positioning System (GPS) to accurately locate the position of the observation points in the field. The study area and field observation points were superimposed on Google Earth satellite imagery for the compilation of large scale field maps.

The soils within the development site were investigated by means of auger observations at a density of 150 x 150 m. Auger holes were made to a maximum depth of 1.5m or to refusal. The soils were described and classified according to the South African Taxonomic Soil Classification System (Soil Classification Working Group, 2nd edition 1991). The system of soil classification is explained in Appendix A.

At each auger point the auger cores were placed on a sample board in 100 mm increments and photographed. The following procedure was followed to note soil properties and classify soils forms accordingly:

i) Identify applicable diagnostic horizons by noting the physical properties such as:

- Effective depth (depth of soil suitable for root development);
- Colour (in accordance with Munsell colour chart);
- Texture (refers to the particle size distribution);
- Structure (aggregation of soil particles into structural units);
- Mottling (alterations due to continued exposure to wetness);
- Concretions (cohesion of minerals into hard fragments);
- Leaching (removal of soluble constituents by percolating water);
- Gleying (reduction of ferric oxides under anaerobic conditions, resulting in grey, low chroma soil colours); and
- Illuviation of colloidal matter from one horizon to another, resulting in the development of grey sandy E-horizons and grey clay G-horizons.

ii) Determine the appropriate soil Form and soil Family according to the above properties.

The soil properties that were used to map fairly homogeneous soil types are discussed in Appendix B.

2.4.2 Soil sampling and analyses

During 2016 no soil chemical analyses were done because soil fertility, other than the general perception, plays a minor role in the agricultural potential of soils. Soil fertility is a variable that can be altered by fertilizers if not on the required level and has to be maintained by fertilizer every year in a crop farming system. The soil physical properties such as effective depth and soil texture, which is properties that cannot be altered, and determines the soil volume for root development and nutrient and water storage is the main physical properties that determine the soil's agricultural ability.

However, in general, natural soils with a sandy loam and sandy clay loam textures, that originated from sedimentary rocks on the Eastern and Western Highveld has a low fertility status due to the high rainfall and leaching effect. The initial cost to ameliorate natural soils to the desired fertility status is high and therefore a build-up fertility status contributes to the agricultural sensitivity of cultivatged fields.

A site visit was conducted in July 2022 to verify the current land uses of the development site and to obtain production and employment information from the farmer. In order to verify the soil's fertility status, samples were taken and analysed for general fertility and acidity indicators. Soil samples were analysed at the soil laboratory of the Institute for Soil, Climate and Water (ISCW Report No. BOERE 202223 15768). The analyses were conducted according to methods set out in Non-Affiliated Soil Analysis Work Committee (1990). The original laboratory report is provided in Appendix D.

2.4.3 Agricultural potential

Agricultural potential was derived based on a combination of climate (annual precipitation and temperature) and physical soil properties required to sustain agronomic cash crops. The more important physical characteristics considered in determining agricultural potential were effective soil depth, soil texture, coarse fragments within the soil profile, internal drainage of the soil profile and slope percentage. The guidelines followed for the evaluation of agricultural potential in terms of physical properties are as follows:

- **Arable - High** – well-drained and moderately well-drained loamy sand to sandy clay loam, non-structured soils with an effective depth deeper than 900 mm.
- **Arable - Moderate** - well-drained and moderately well-drained loamy sand to sandy clay loam, non-structured soils with an effective depth of 500- 900 mm.
- **Grazing - Low** – shallow well-drained and moderately well-drained sandy or structured clay soils.
- **Grazing/wetland - Very low** – Imperfectly to poorly drained, grey, sandy soils showing evidence of periodic percolating water tables, or black and grey clay soils showing evidence of poor internal drainage or any soils in extreme arid climatic conditions, shallow rocky areas, eroded areas or severely disturbed areas.

2.4.4 Land use mapping

The extents of land use practices were surveyed during a site visit in July 2022. Soil samples were collected from dominant soil forms in order to determine the current soil fertility status.

2.4.5 Agricultural Sensitivity

The detailed soil map, indicating dominant soil forms and associated properties, serves as basis of the derived agricultural sensitivity map. The soil forms are grouped in agricultural potential classes based on soil properties, topography and climate. The agricultural potential layer is then refined by incorporating current land use practices in order to produce a final agricultural sensitivity map. The following principles were followed:

High agricultural sensitivity:

- All deep, well-drained, loamy sand to sandy clay loam soils on slopes less than 7.1%, irrespective of current agricultural use.
- All currently cultivated fields (crop farming), irrespective of soil potential.
- All deep, high potential soils occupied by semi-permanent agricultural structures (structures without roofs and concrete foundations e.g. cattle kraals, bale storage camps etc.)
- All abandoned/vacant sections that maybe occupied by partly demolished structures, situated on deep, high potential soils and surrounded by crop farming or cultivated pastures.

Medium agricultural sensitivity:

- All shallow soils under cultivated pastures even if not well-drained
- All shallow soils without frequent rocky outcrops.
- All soils on slopes between 7.1 and 14.3%.
- All soils with a pure sand texture but not subject to wetness.
- All deep, but highly dispersive soils.

Low agricultural potential:

- All shallow soils with frequent rocky outcrops.
- All soils on slopes above 14.3%.
- All soils subjected to wetness to such a degree that crop farming is not possible and not previously transformed to cultivated pastures.
- All soils occupied by permanent structures (include structures with corrugated or tile roofs and concrete foundations including immediate surrounding zone)

2.5 Map compilations

The field data was captured in shapefile format (shp) and processed and stored in a Geographic Information System called ArcGIS. The maps are compiled in a map extendable document format (mxd) and exported to Jpeg format. The shapefiles can be exported to a dxf or dwg format for CAD users. The shapefiles, dxf and dwg formats are available on request.

The maps were generated in a projected coordinate system using the longitude of origin (LO) coordinate system based on the 27° East meridian, WG1984 Ellipsoid and Hartebeesthoek 1994 Datum.

2.6 Agricultural impact assessment

The method for rating environmental impacts is provided Appendix E.

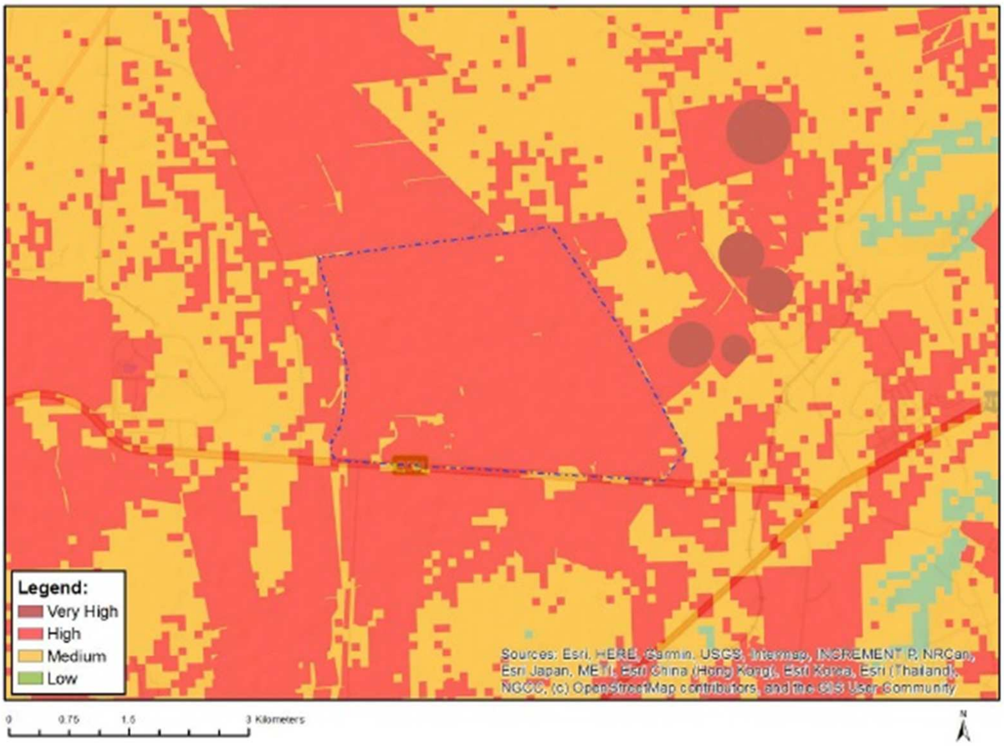
3. SITE SENSITIVITY VERIFICATION

3.1 Agricultural sensitivity as rated by the Screening Tool

The agricultural sensitivity of the development site was rated in a report generated by means of the web based Screening Tool, dated 20/07/2022 07:47:45, compiled and signed by P.I. Steenekamp of Rehab Green CC. The application category was Agriculture_Forestry_Fisheries/Crop production. The Protocol requires the screening report to accompany the specialist report for environmental authorization. The spatial extent of the 4 agricultural sensitivity classes consisting of very high, high, medium and low, is shown in Figure 2 as extracted from the screening report.

Figure 2: Agricultural sensitivity extracted from the Screening Report

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
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Page 10 of 18

Disclaimer applies
20/07/2022

The Protocol further requires the agricultural sensitivity ratings of the Screening Tool be verified. The ratings of the Screening Tool are shown in Figure 3a. An intensive baseline field investigation was conducted by means of a detailed soil and agricultural potential assessment, Steenekamp 2016. Soil data was gathered by means of 318 auger observations across the development site. A detailed soil and agricultural potential map was compiled (Figures 6 and 7 respectively). The current land uses were assessed in July 2022 and an agricultural sensitivity spatial layer (shapefile) was compiled based on a combination of detailed soil, agricultural potential and land use information and a final refined agricultural sensitivity map was compiled (Figure 3b) with the same categories than those of the Screening Tool.

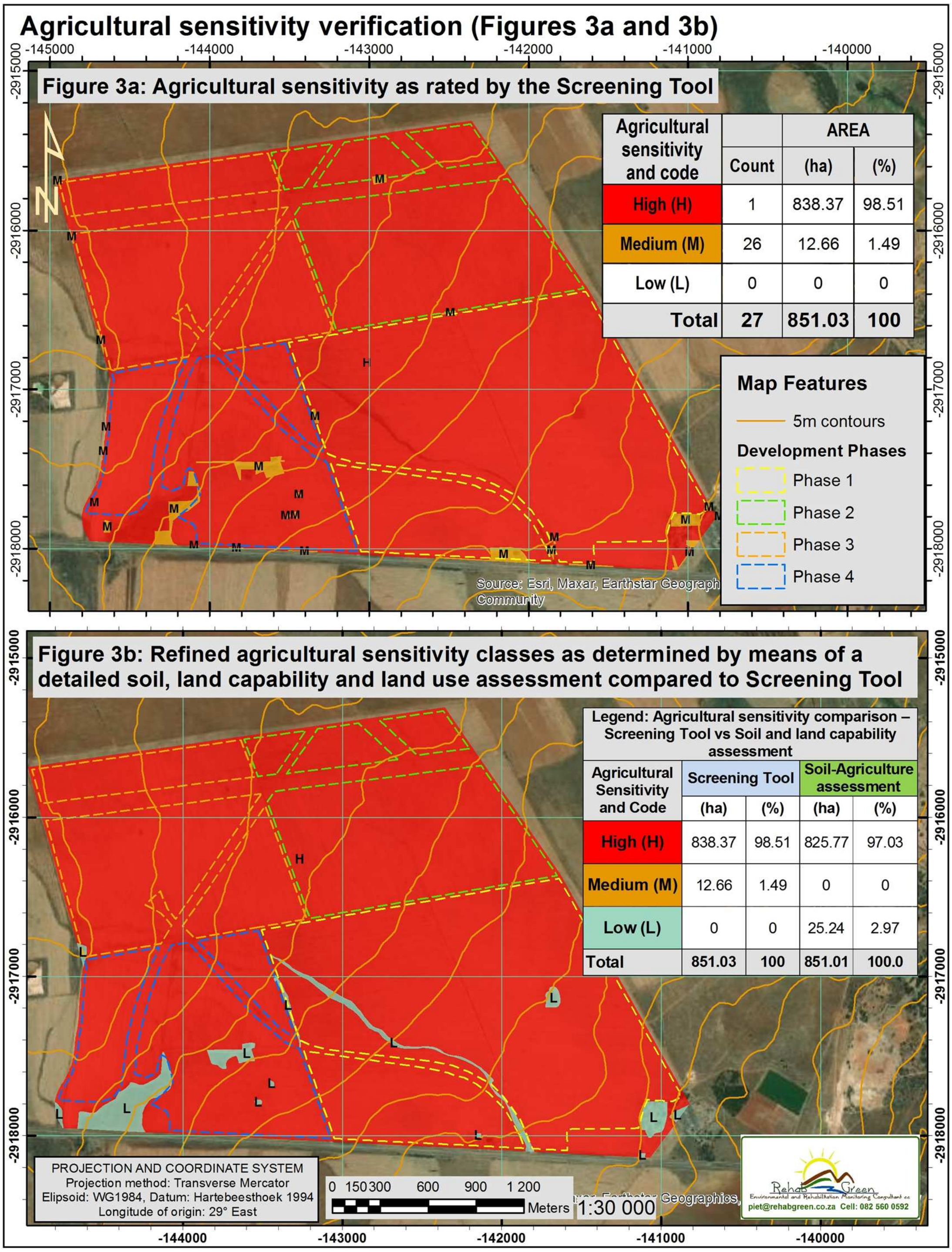


Figure 3a and 3b is a comparison of the agricultural sensitivity classes rated by the Screening Tool (Figure 3a) and the refined classes as derived from the detailed soil, agricultural potential and land use data (Figure 3b).

3.2 Dispute of the agricultural sensitivity rating of the Screening Tool

Figure 3a and 3b is a visual comparison of the areas and percentages of agricultural sensitivity ratings by the Screening Tool and those refined by means of the detailed soil, agricultural potential and land use assessment (see rating methodology in section 2.4.5). Table 1 provides a comparison of the areas and percentages comprised by each of the 3 sensitivity classes.

The comparison in Table 1 shows a good correlation between the ratings for the high agricultural sensitive class (98.51 and 97.03%). There are however, major differences between the ratings of the medium and low sensitivity classes, although it comprises a very small percentage of the total development site. The Screening Tool rated 1.49% of the development site as medium agricultural sensitivity, while 0% was rated as medium sensitivity by the detailed soil, agricultural potential and land use assessment. The reason for this major difference is because the Screening Tool rated the agricultural sensitivity of 26 very small, isolated units (0.3ha average), consisting of permanent structure footprints and shallow soils with rocky outcrops as medium sensitivity, instead of low. Permanent structure footprints have low agriculture sensitivity and shallow, rocky spots within maize fields (that can be grazed) are mostly permanently abandoned due to the limited size, and therefore have low agricultural sensitivity. The Screening Tool rated 0% of the development footprint as low agricultural sensitivity while 2.97% was rated as low agricultural sensitivity by the soil, agricultural potential and land use assessment. Footprints of permanent structures, surface drainage channels and small and abandoned rocky spots were rated as low agricultural sensitivity.

Table 1: Comparison of agricultural sensitivity ratings

Legend: Agricultural sensitivity comparison – Screening Tool vs Soil and land capability assessment						
Agricultural Sensitivity and Code	Screening Tool			Land capability assessment		
	Count	(ha)	(%)	Count	(ha)	(%)
High (H)	1	838.37	98.51	1	825.77	97.03
Medium (M)	26	12.66	1.49	0	0	0
Low (L)	0	0	0	13	25.24	2.97
Total	**27**	**851.03**	**100**	**14**	**851.01**	**100**

The agricultural sensitivity ratings of the Screening Tool are therefore not accepted as correct and any further issues related to agricultural sensitivity will be addressed and or evaluated against the ratings of the refined agricultural sensitivity spatial layer or shapefile as displayed in Figure 3b.

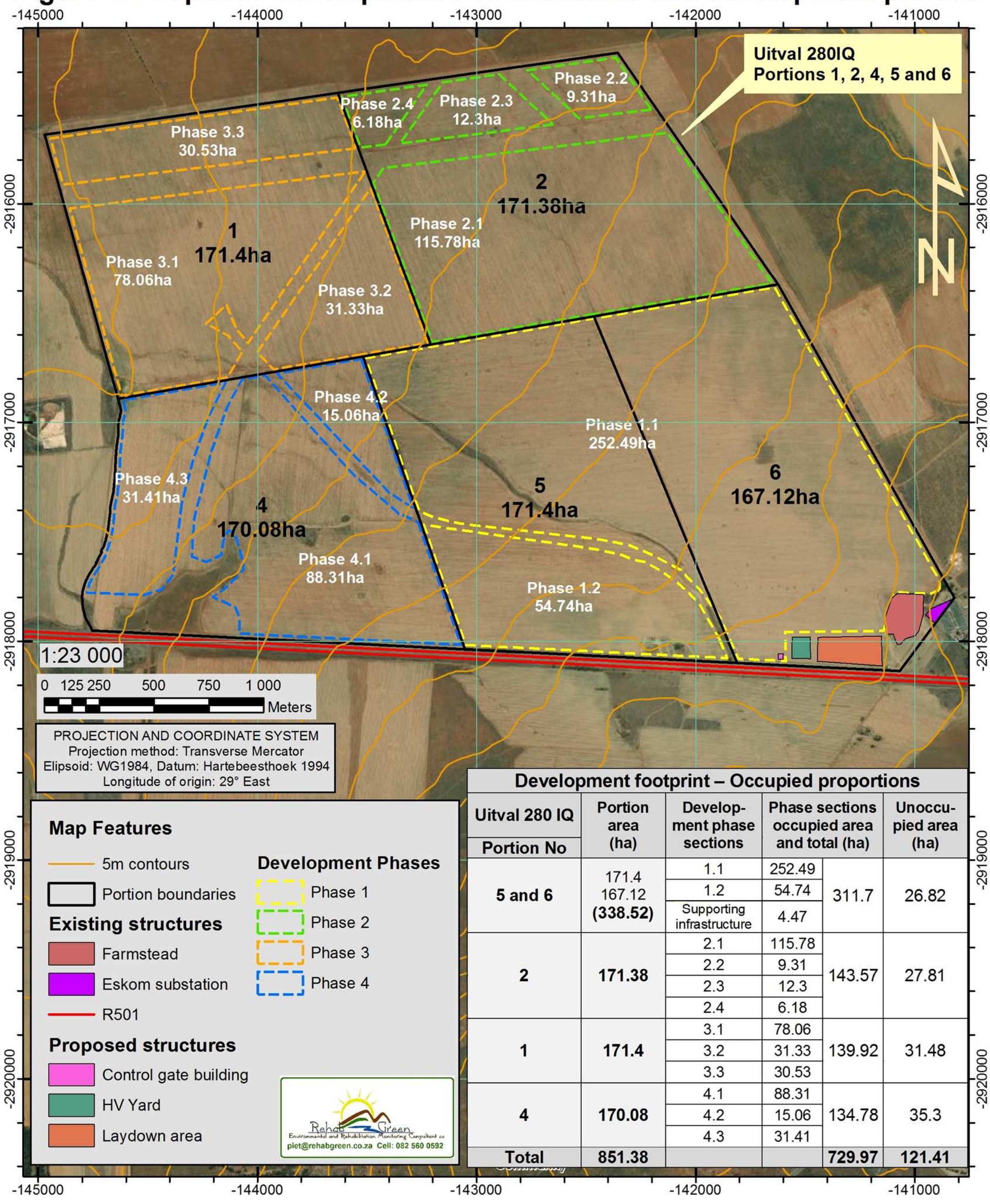
Because the proposed development site occupies land with high agricultural sensitivity, the Protocol requires an Agricultural Agro-Ecosystem Assessment to be done based on the status quo of the site.

4. AGRICULTURAL AGRO-ECOSYSTEM ASSESSMENT

4.1 Proposed development structures and phases

The development site comprises the total extent of portions 1, 2, 4, 5 and 6 of the farm Uitval 280IQ, situated in the southwest section of Gauteng province, near Westonaria. The 5 portions, indicated by black outlines in Figure 4, comprise 851 ha together. The majority of the 5 portions are used for maize production. Existing structures are a farmstead and related buildings and a small section of an Eskom substation.

Figure 4: Proposed development site structures and development phases



Development footprint – Occupied proportions					
Uitval 280 IQ Portion No	Portion area (ha)	Development phase sections	Phase sections occupied area and total (ha)		Unoccupied area (ha)
5 and 6	171.4 167.12 **(338.52)**	1.1	252.49	311.7	26.82
		1.2	54.74		
		Supporting infrastructure	4.47		
2	171.38	2.1	115.78	143.57	27.81
		2.2	9.31		
		2.3	12.3		
		2.4	6.18		
1	171.4	3.1	78.06	139.92	31.48
		3.2	31.33		
		3.3	30.53		
4	170.08	4.1	88.31	134.78	35.3
		4.2	15.06		
		4.3	31.41		
Total	**851.38**			**729.97**	**121.41**

4.2 Status quo of the development site

The following sections addresses specific reporting requirement of the Protocol.

4.2.1 Geology and terrain

The proposed site is situated on a level to slightly undulating, east-west elongated plain about 10 to 15 km wide and about 50 km long. It is drained by the Mooi River to the west. In the south it is bordered by hilly land with tilted geological formations due to the Vredefort impact event. The underlying geology is mostly dolomite and chert of the Malmani Subgroup of the Chuniespoort Group. However, due to the presence of relatively high hills to the south, the parent materials of the soils appear to be dominated by local colluvium (as attested by the rock fragments present).

As is the case in most areas underlain by dolomite and chert, natural drainage lines are few and far apart. A weakly developed bottomland borders the study area to the west. However, the area is traversed by a number of old erosion gullies and rills, some of which extend down to the bedrock or to colluvium cemented by iron and manganese oxides, which underwent hardening on exposure. The smaller erosion gullies and rills have been simply ploughed over.

The site footprint slopes gently to the northwest with slopes of 0-1.5% slopes.

4.2.2 Vegetation composition

The development site is situated in the Grassland Biome and Dry Highveld Grassland Bioregion. The vegetation type is classified as Carletonville Dolomite Grassland. The vast majority of the site is transformed many years ago and used for crop farming since.

4.2.3 Available water sources

No water sources occur in the close vicinity that is a sustainable source for irrigation purposes.

4.2.4 Agro-climatic information

Agro-climatic data is obtained from the Johannesburg-Rand weather station calculated by software named CLIMWAT for CROPWAT, which is a joint publication of the Water Resources, Development and Management Service and the Environment and Natural Resources Service of the Food and Agriculture Organization (FAO) of the UN.

Table 2 provides climate data in terms of:

- Mean daily maximum temperature in °C
- Mean daily minimum temperature in °C
- Mean relative humidity in %
- Mean wind speed in km/day
- Mean sunshine hours per day
- Mean solar radiation in MJ/m2/day
- Monthly rainfall in mm/month
- Monthly effective rainfall in mm/month
- Reference evapotranspiration calculated with the Penman-Monteith method in mm/day.

Long term average minimum daily temperatures are 10°C with an average maximum of 22.5 °C. Long term average humidity is 59% and evapotranspiration calculated with the Penman-Monteith method 3.96 mm/day.

Table 2: Climate

Monthly ETo Penman-Monteith - D:\My_CLIMWAT_Files\JOHANNESBURG-RAND.pen

Country: Location 26 Station: JOHANNESBURG-RAND

Altitude: 1668 m. Latitude: 26.25 °S Longitude: 28.00 °E

Month	Min Temp	Max Temp	Humidity	Wind	Sun	Rad	ETo
	°C	°C	%	km/day	hours	MJ/m²/day	mm/day
January	14.4	26.1	70	181	7.7	22.9	4.82
February	13.9	25.5	74	181	7.6	21.7	4.44
March	12.8	24.4	70	164	7.2	19.2	3.91
April	10.6	22.2	63	147	7.7	16.9	3.28
May	6.7	18.9	51	164	8.1	14.6	2.81
June	3.9	16.7	49	199	8.1	13.3	2.55
July	3.9	16.7	49	199	8.2	14.0	2.57
August	6.7	20.0	44	216	8.6	16.8	3.50
September	8.9	22.8	45	259	8.4	19.6	4.58
October	11.7	25.0	55	259	8.1	21.7	5.04
November	12.8	25.5	65	251	7.7	22.6	4.99
December	13.9	26.1	67	216	7.9	23.3	5.04
Average	**10.0**	**22.5**	**59**	**203**	**7.9**	**18.9**	**3.96**

Table 3 shows average long-term monthly and annual rainfall data. The average rainfall of 673 mm per annum is concentrated in the summer months of November to March with January and December the wettest months, which makes the proposed development area suitable for dry land crop farming for a wide variety of crops.

Table 3: Annual rainfall

Monthly rain - D:\My_CLIMWAT_Files\JOHANNESBURG-RAND.cli

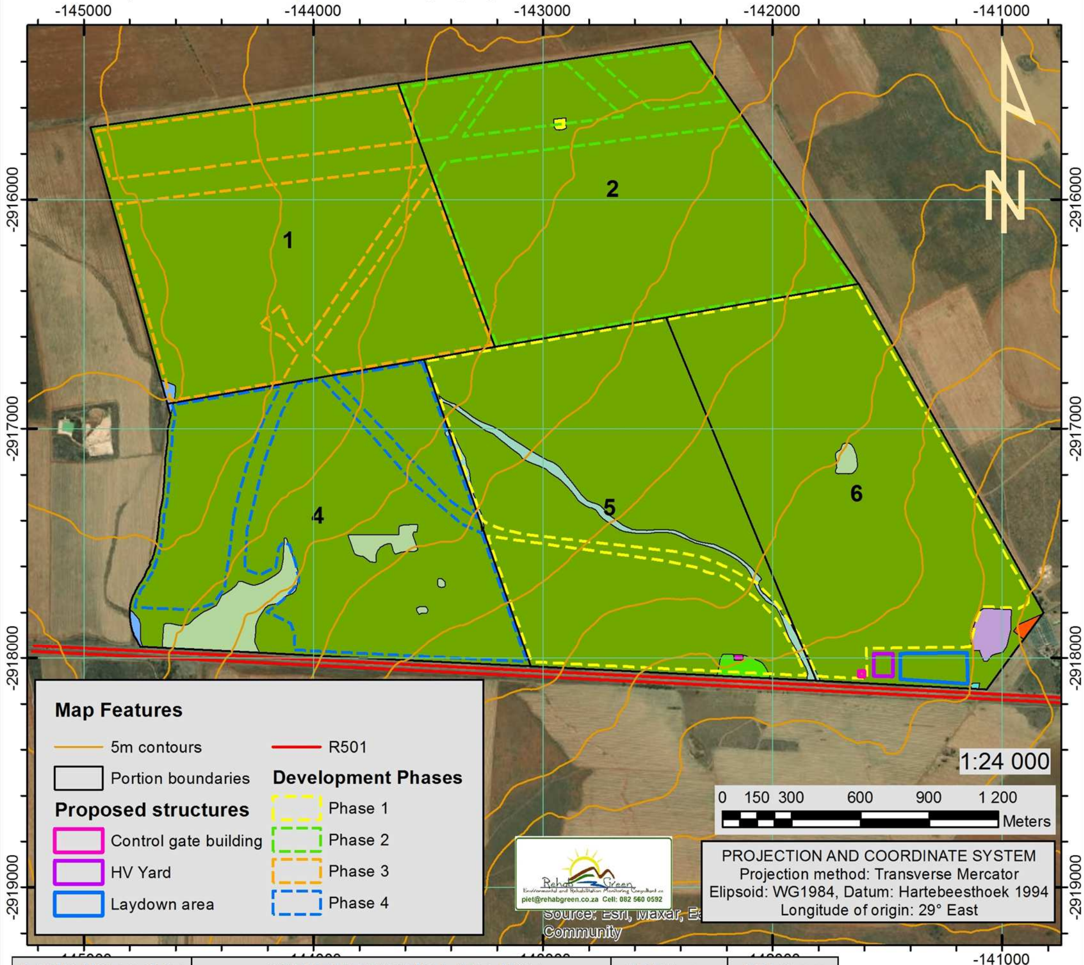
Station: JOHANNESBURG-RAND Eff. rain method: USDA S.C. Method

	Rain	Eff rain
	mm	mm
January	153.0	115.5
February	103.0	86.0
March	89.0	76.3
April	67.0	59.8
May	17.0	16.5
June	11.0	10.8
July	4.0	4.0
August	9.0	8.9
September	29.0	27.7
October	81.0	70.5
November	121.0	97.6
December	124.0	99.4
Total	**808.0**	**673.0**

4.2.5 Current land uses within the development site

The extents of current land uses within the proposed development site were assessed during July 2022 and are shown in Figure 5. The land uses are summarized in Table 4.

Figure 5: Current land uses at the proposed development site for the Sibanye PV Plant, situated on portions 1, 2, 4, 5 and 6 of the farm Uitval 280IQ



LAND USE CODE	CURRENT MINING LAND USE	AREA (ha)	AREA (%)
CF	Crop farming - mainly maize	823.79	96.80
V-DS	Vacant - partly demolished structures	0.25	0.03
V-TS	Vacant - temporary non-farm structures	1.73	0.20
V-PFS	Vacant - permanent farm structures	0.10	0.01
V-W	Vacant - wetland	0.93	0.11
V-SR	Vacant - shallow with rocky outcrops	14.48	1.70
DC	Shallow, artificial surface drainage channel	6.08	0.71
FS	Farmstead and related buildings	3.08	0.36
RS	Small road shop	0.08	0.01
SS	Eskom substation	0.49	0.06
	Total	**851.01**	**100.0**

Table 4 shows that the majority of the development site (96.8%; 823.79ha) is utilized for maize production, probably in a 4-year rotating system with soybeans. Land uses on the remainder of the site consist of 8 other small uses, occupying each a very small footprint, mostly less than 1 ha. There are further 5 sections identified with no specific land use, which are vacant due to shallow soils and/or rockiness (isolated rocky outcrops). These 5 sections comprise a total of 14.48 ha (1.7%) and are not included in an effective grazing system due to the limited sizes and isolated nature.

Table 4: Current land uses within the development site

LAND USE CODE	CURRENT LAND USE	AREA (ha)	AREA (%)
CF	Crop farming - mainly maize	823.79	96.80
V-DS	Vacant - partly demolished structures	0.25	0.03
V-TS	Vacant - temporary non-farm structures	1.73	0.20
V-PFS	Vacant - permanent farm structures	0.10	0.01
V-W	Vacant - wetland	0.93	0.11
V-SR	Vacant - shallow with rocky outcrops	14.48	1.70
DC	Shallow, artificial surface drainage channel	6.08	0.71
FS	Farmstead and related buildings	3.08	0.36
RS	Small road shop	0.08	0.01
SS	Eskom substation	0.49	0.06
	Total	**851.01**	**100.0**

During the land use assessment in July 2022, maize crops were still on the fields, ready to be harvested as shown in Photo 1.

Photo 1: Maize at portion 6 during July 2022

4.2.6 Dominant soil types

The detailed soil survey was conducted in the summer season, during January 2016. Soil physical properties develop over thousands of years, and any physical variation that could take place since, are considered insufficient to require an updated soil assessment. Soils in the natural state are not subjected to mentionable seasonal variation in chemical properties and follow-up surveys during other seasons are not required.

The soil cover is remarkably uniform with respect to soil form, colour and texture. The development site is dominated by red, sandy clay loam soils that belong to the Hutton or Lichtenburg forms. The main variation encountered was the depth of the profiles to the underlying colluvial material or hard rock. Another variation important to land use is the variability of the underlying colluvium in terms of coarse fragment and iron-manganese nodule content, as well as the degree of cementation by iron-manganese oxides, the degree of hardening of the latter, and the degree of restriction of these attributes to crop production. The only other soil types encountered were narrow areas of yellow-brown soils underlain by soft or hard plinthite of the Avalon and Glencoe forms, respectively, and associated red soft plinthic soils of the Bainsvlei form. These are related to the drainage depression on the western side of the devepmen site (the Bank Fault Spruit), and possibly to the presence of non-dolomitic geology in the south.

The effective depth of transported soils is often complex to assess. In the study area the following were taken to constitute effective depth:

(1) hard plinthite, constituted of nodules and other coarse fragments, cemented to the extent that little or no soil is present and a hand auger cannot penetrate;
(2) soil material dominated by non-cemented nodules and other course fragments, to the extent that there is almost no fine material present that can result in any meaningful water-holding capacity; and
(3) bedrock.

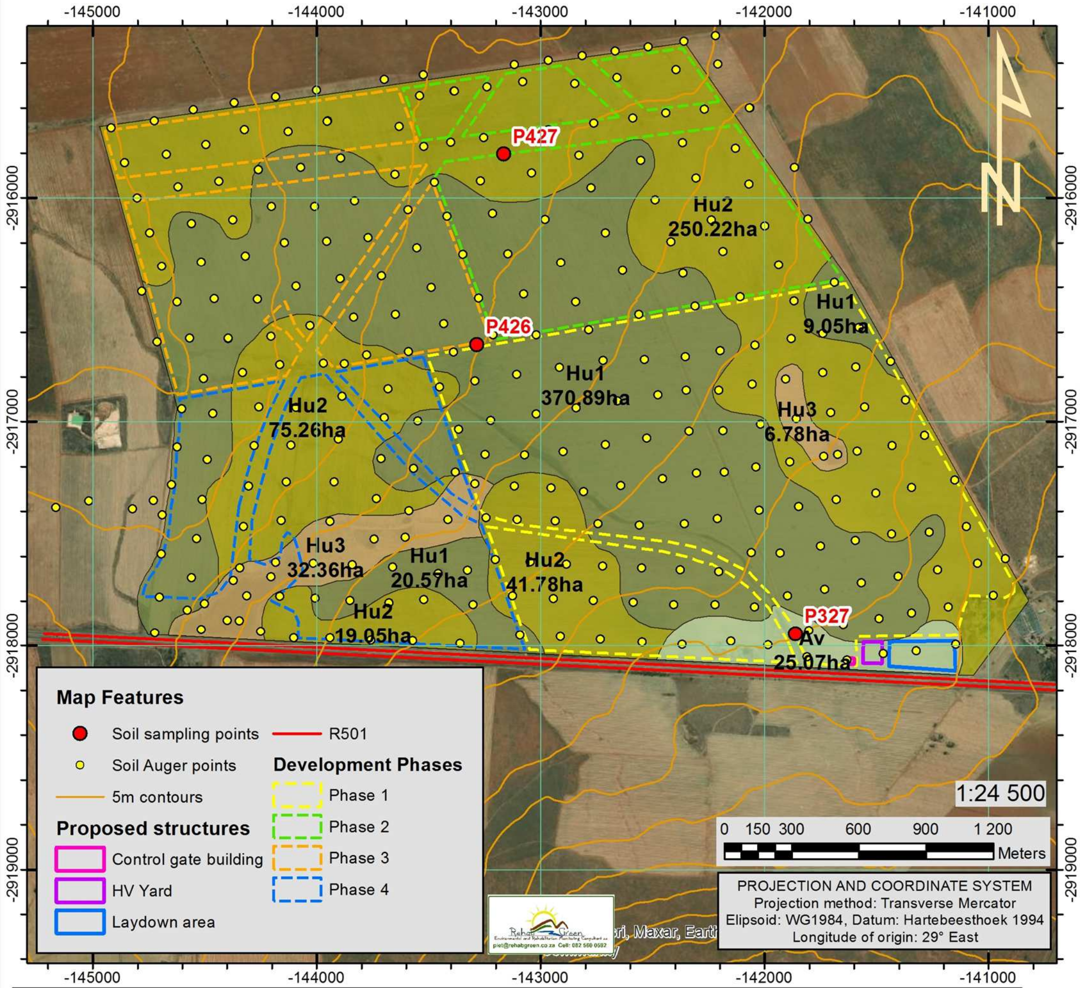
A total of 318 auger observations were made at pre-determined grid points or occasionally in-between, in order to locate and accurately map soil boundaries. Various soil properties were noted and the soils were classified in a soil Form and Family according to the Taxonomic Soil Classification System for South Africa, 1991.

The gathered soil information was processed and a total of 4 units were mapped that are largely homogeneous in terms of dominant soil form, effective soil depth, internal drainage, terrain unit and slope percentage. The units are symbolized as Hu1, Hu2, Hu3 and Av and are shown on the soils map, Figure 6, and the units are referred to as soil forms or soil types.

Figure 6 contains an abbreviated soil legend. The full soil legend is shown as Table 5, which described the soils in terms of the following aspects.

- Dominant and subdominant soil forms and families;
- An average effective depth range in mm;
- The estimated clay content of the A and B horizons;
- The soil texture class range;
- A description of the terrain unit and average slope percentage range;
- A broad description of the dominant soil form in terms of the effective soil depth, internal drainage, soil colour and soil texture class;
- A description of the soil horizon sequences;
- The agricultural potential and wetland zone classification; and
- The area and percentage comprised by each soil type.

Figure 6: Detailed soil map of the proposed development site for the Sibanye PV Plant, situated on portions 1, 2, 4, 5 and 6 of the farm Uitval 280IQ



ABBREVIATED SOIL LEGEND

Soil Type Code	Dominant & subdominant Soil Form and Family	Summarized description of soil type and terrain	Agricultural potential	Wetland/Terrestrial zone	Area (ha)	Area (%)
Hu1	*Hutton 2100; Lichtenburg 2100	Deep (90-150 cm), red, well-drained, sandy clay loam soils,situated on level crests and midslopes; (0-2% slope)	Arable; Moderately high	Terrestrial	400.51	47.06
Hu2	*Hutton 2100; Lichtenburg 2100	Moderately deep (50-90cm), red, well-drained, sandy clay loam soils, situated on level crests and midslopes; (0-2% slope)	Arable; Moderate	Terrestrial	386.31	45.39
Hu3	*Hutton 2100; Lichtenburg 2100	Shallow (10-50 cm), brownish red, well-drained, gravelly sandy loam to sandy clay loam soils with patches of exposed rock, situated on gently sloping crests and midslopes; (1-3% slope)	Grazing land; Low	Terrestrial	39.14	4.60
Av	*Avalon 2100; Glencoe 2100, Bainsvlei 2100	Deep (90-150 cm), brownish yellow or yellowish red, moderately well-drained, sandy clay loam soils underlain by soft or hard plinthite situated on level to very gently sloping footslopes; (1-2% slope)	Arable; Moderately high	Terrestrial	25.07	2.95
* Dominant soil form and family				Total	851.03	100.0

Table 5: Detailed soil legend of the development site

SOIL LEGEND											
Soil Type Code	**Dominant & subdominant Soil Form and Family**	**Effective Soil Depth (mm)**	**% Clay per horizon (A and B)**	**Soil Texture Class**	**Terrain unit and slope**	**Summarized description of dominant soil type**	**Summarized description of soil horizons sequences**	**Agricultural potential**	**Wetland/ terrestrial zone**	**Area (ha)**	**Area (%)**
Hu1	*Hutton 2100; Lichtenburg 2100	900-1500	A: 20-30 B: 25-35	Sandy clay loam	Level crests and midslopes; (0-2% slope)	Deep (90-150 cm), red, well-drained, sandy clay loam soils	Brownish red, sandy clay loam orthic A-horizons, over red, apedal, sandy clay loam B horizons, underlain by loose or weakly cemented ferruginised chert, sandstone and quartzite fragments with iron-manganese nodules	Arable; Moderately high	Terrestrial	400.51	47.06
Hu2	*Hutton 2100; Lichtenburg 2100	500-900	A: 20-26 B: 25-28	Sandy clay loam	Level crests and midslopes; (0-2% slope)	Moderately deep (50-90cm), red, well-drained, sandy clay loam soils	Brownish red, sandy clay loam orthic A-horizons, over red, apedal, sandy clay loam B horizons, gravelly in places, underlain by weakly to strongly cemented ferruginised chert, sandstone and quartzite fragments with abundant iron-manganese nodules	Arable; Moderate	Terrestrial	386.31	45.39
Hu3	*Hutton 2100; Lichtenburg 2100	100-500	A: 15-20 B: 15-25	Sandy loam to sandy clay loam	Gently sloping crests and midslopes; (1-3% slope)	Shallow (10-50 cm), brownish red, well-drained, gravelly sandy loam to sandy clay loam soils with patches of exposed rock.	Brownish red, gravelly sandy loam orthic A-horizons underlain by thin, gravelly and stony, red apedal, sandy clay loam B horizons, underlain by weakly to strongly cemented ferruginised chert, sandstone and quartzite fragments with iron-manganese nodules; chert outcrops in places	Grazing land; Low	Terrestrial	39.14	4.60
Av	*Avalon 2100; Glencoe 2100, Bainsvlei 2100	900-1500	A: 20-30 B: 25-35	Sandy clay loam	Level to very gently sloping footslopes; (1-2% slope)	Deep (90-150 cm), brownish yellow or yellowish red, moderately well-drained, sandy clay loam soils underlain by soft or hard plinthite.	Yellowish or reddish brown, sandy clay loam orthic A-horizons, underlain by brownish yellow or yellowish red, sandy clay loam, apedal B1-horizons, underlain by soft or hard plinthic B2-horizons	Arable; Moderately high	Terrestrial	25.07	2.95
* Dominant soil form and family									**TOTAL**	**851.03**	**100.0**

4.2.6.1 Soil fertility status

During the current land use assessment, conducted in July 2022, the dominant soil forms were augered at 3 positions and the auger cores were placed in 100mm increments on a sample board in order to obtain a visual perception to the soil profiles. The A-horizons (0-250 mm) were sampled and analysed in order to obtain a broad perspective of the soil's fertility status. The positions of the 3 soil sampling points are shown on the soil map, Figure 6, and the coordinates are included in Appendix C, Table C1.The soil profiles is shown in Photos 2-4.

Photo 2: Auger point P327; Soil type Av (Avalon)	Photo 3: Auger point P426; Soil type Hu1 (Hutton)	Photo 4: Auger point P427; Soil type Hu2 (Hutton)
		

The soil analytical results are shown in Table 6. The mean values of the cations, potassium (K), calcium (Ca), magnesium (Mg) and sodium (Na) as well as phosphorus (P), pH and resistance (R_S) were calculated and highlighted in orange at the bottom of Table 6.

Table 6: Soil chemical analyses

			Chemical properties													
			Extractable Cations													
Samp Point	Hor	Depth (mm)	K	Ca	Mg	Na	K	Ca	Mg	Na	*Titr. Acidity	*Acid satura -tion	Ca:Mg	R_S (resistance)	pH	P Bray1
			Ammonium acetate (mg/kg)				cmol(+)/kg				cmol(+)/kg	%	ratio	ohm	H_2O	mg/kg
P327	A	0-250	88	554	182	5.5	0.2251	2.7645	1.4979	0.0239	-	-	1.8	2420	6.14	56.3
P426	A	0-250	82	488	169	5.3	0.2097	2.4351	1.3909	0.0231	-	-	1.8	2520	6.16	97.4
P427	A	0-250	95	645	201	5.2	0.2430	3.2186	1.6543	0.0226	-	-	1.9	2200	5.78	62.0
Mean			**88**	**562**	**184**	**5.3**							**1.8**	**2380**	**6.02**	**71.9**
***Analyses done when pH is below 5.5**																

4.2.6.2 Soil fertility evaluation

The mean concentration values of the cations (K, Ca, Mg and Na) as well as phosphorus, pH and resistance (highlighted in orange, Table 6) were compared to general fertility guidelines in Table 7.

Table 7: Soil fertility compared to broad fertility guidelines

		Guidelines		Current status rating		Preferred status
Element or measurement	**Unit**	**Low**	**High**	**Mean value**	Rating	
Potassium (K)	mg/kg	<40	>250	**88**	Medium	80-150
Calcium (Ca)		<200	>3000	**562**	Medium	600-1000
Magnesium (Mg)		<50	>250	**184**	Medium-high	80-150
Ca:Mg (cmol(+)/kg)	Ratio	<2	>4	**1.8**	Good (slight erosion susceptibility)	2-4
Acid saturation	%	<10	>30	**-**	-	<20
Sodium (Na)	mg/kg	<50	>200	**5.3**	Low (positive in terms of sodicity)	<50
ESP	%	<6	>15	**-**	-	0-6
Resistance	ohm	<200	>300	**2380**	High (positive in terms of salinity)	>300
Phosphorus (P)	mg/kg	<5	>35	**71.9**	High (Very well build-up)	*10-20 **30-50
$pH(H_2O)$	Very acid Acid Moderately acid Slightly acid Neutral Moderately alkaline Alkaline		<=4.5 4.6-5.4 5.5-5.9 6.0-6.8 6.8-7.2 7.2-8.1 >=8.2	**6.03**	Slightly Acid (ideal)	6-6.8
* pastures ** crop farming						

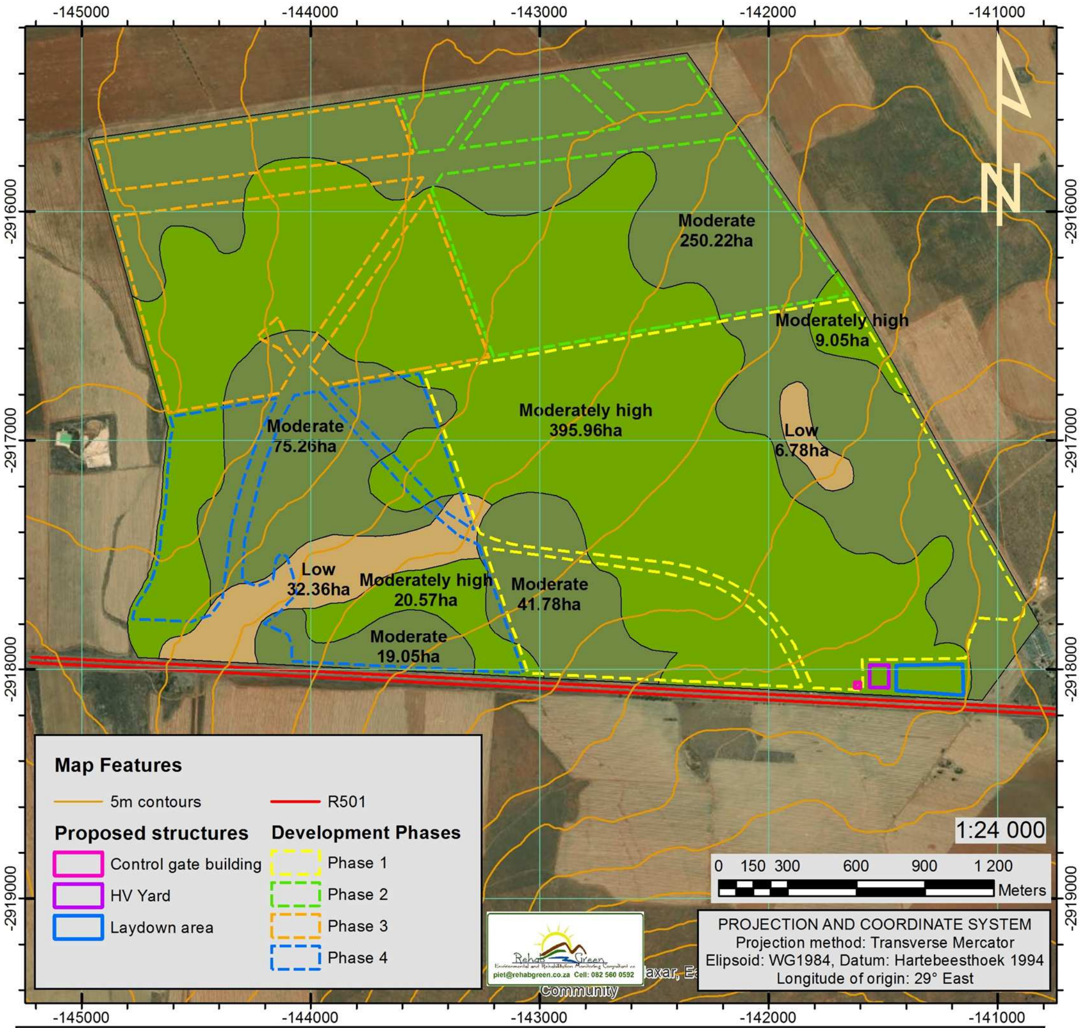
The mean K and Ca concentrations are rated as medium and Mg as medium-high, which indicate a fairly well build-up status compared to general natural levels on the Western Highveld and reflect a fairly fertile chemical status in terms of cations. The mean Na concentration of 5.3 mg/kg is low (which is positive) and indicates hardly any accumulation of sodium in the soil profile. The mean ration of Ca to Mg is 1.8, which is somewhat below the preferred range and indicates somewhat insufficient levels of Ca to buffer the destabilizing effect of Mg on soil structure, which reflect some erosion susceptibility. The high mean resistance value of 2380 ohm confirms low salt concentrations and subsequent the absence of saline soil conditions. The mean P concentration of 71.9 mg/kg indicates a very well build-up status, which is ideal for pasture (10-20 mg/kg), as well as crop farming (30-50 mg/kg). The mean soil acidity/alkalinity measured as pH(water) is 6.03, which is ideal and indicates slightly acid soil conditions.

4.2.6.3 Agricultural potential

The agricultural potential of the soils at the development site was rated, considering climate as described in section 4.2.4, and physical soil characteristics as described in the soils legend of Table 5. The extent of derived agricultural potential classes is shown in Figure 7.

The majority of the development site, translating to 95.4% (812 ha), was classed as moderate or moderately high agricultural potential and are highly suitable for crop farming. Only 4.6% (39 ha) of the development site was classified as low agricultural potential, consisting of soils more suitable for grazing purposes.

Figure 7: Agricultural potential map of the proposed development site for the Sibanye PV Plant, situated on portions 1, 2, 4, 5 and 6 of the farm Uitval 280IQ



AGRICULTURAL POTENTIAL			
Agricultural potential	**Summarized description of soil type and terrain**	**Area (ha)**	**Area (%)**
Arable; Moderately high	Deep (90-150 cm), red, well-drained, sandy clay loam soils and deep (90-150 cm), brownish yellow or yellowish red, moderately well-drained, sandy clay loam soils underlain by soft or hard plinthite.	425.58	50.01
Arable; Moderate	Moderately deep (50-90cm), red, well-drained, sandy clay loam soils, situated on level crests and midslopes; (0-2% slope).	386.31	45.39
Grazing land; Low	Shallow (10-50 cm), brownish red, well-drained, gravelly sandy loam to sandy clay loam soils with patches of exposed rock, situated on gently sloping crests and midslopes; (1-3% slope).	39.14	4.6
	Total	**851.03**	**100.0**

Table 8, which also serve as the legend in Figure 7, summarises the agricultural potential classes in terms of soil physical properties, terrain and slope, and also provide the area and percentage comprised by each class.

Table 8: Agricultural potential of the development site

AGRICULTURAL POTENTIAL			
Agricultural potential	**Summarized description of soil type and terrain**	**Area (ha)**	**Area (%)**
Arable; Moderately high	Deep (90-150 cm), red, well-drained, sandy clay loam soils and deep (90-150 cm), brownish yellow or yellowish red, moderately well-drained, sandy clay loam soils underlain by soft or hard plinthite.	425.58	50.01
Arable; Moderate	Moderately deep (50-90cm), red, well-drained, sandy clay loam soils, situated on level crests and midslopes; (0-2% slope).	386.31	45.39
Grazing land; Low	Shallow (10-50 cm), brownish red, well-drained, gravelly sandy loam to sandy clay loam soils with patches of exposed rock, situated on gently sloping crests and midslopes; (1-3% slope).	39.14	4.6
	Total	**851.03**	**100.0**

5. AGRICULTURAL SENSITIVITY OF THE DEVELOPMENT SITE

5.1 Refined agricultural sensitivity of the development site

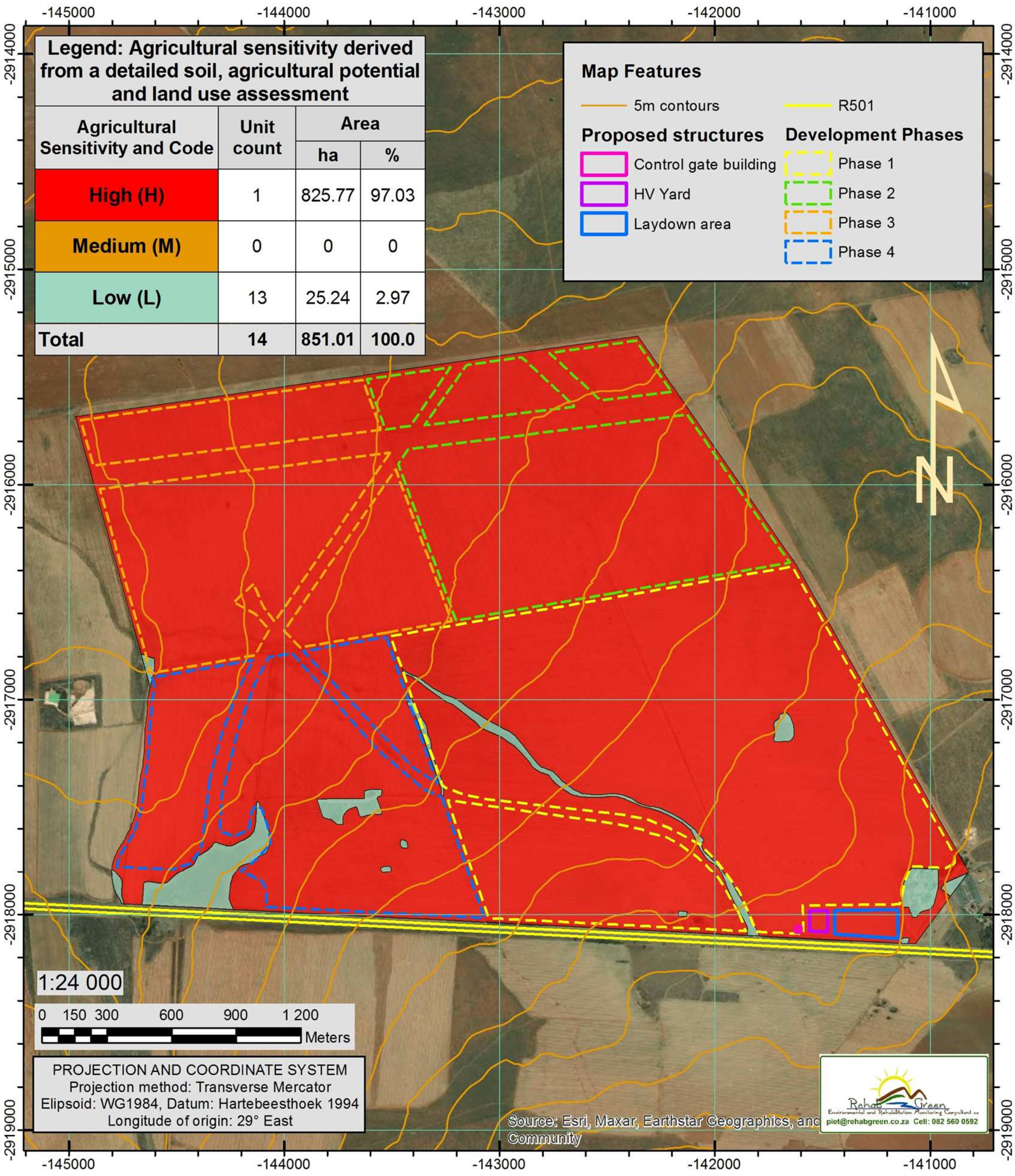
An agricultural sensitivity evaluation was done for the proposed development site that considered soil physical and chemical properties, climatic conditions and current agricultural practices as presented in Section 4. The agricultural sensitivity resulted from a combination of the mentioned aspects was captured in a spatial format (shapefile) and an agricultural sensitivity map was compiled (Figure 8). This agricultural sensitivity layer is already displayed as Figure 3b in order to verify the accuracy of the agricultural sensitivity ratings of the Screening Tool. The Screening Tool ratings were found inaccurate as stated in Section 3.2 and the "refined" agricultural sensitivity ratings as generated from this assessment will apply in any future issues related to the agricultural sensitivity of the development site. The extent of refined agricultural sensitivity classes is shown in Figure 8 and the footprints of the planned development phases are overlain on the refined sensitivity classes.

Table 9, which also serves as the legend for Figure 8 shows the proportions of the refined agricultural sensitivity classes of the development site.

Table 9: Refined agricultural sensitivity classes derived

Legend: Agricultural sensitivity derived from a detailed soil, agricultural potential and land use assessment			
Agricultural Sensitivity and Code	**Unit count**	**Area**	
		ha	**%**
High (H)	1	825.77	97.03
Medium (M)	0	0	0
Low (L)	13	25.24	2.97
Total	**14**	**851.01**	**100.0**

Figure 8: Refined agricultural sensitivity map of the proposed development site for the Sibanye PV Plant, situated on portions 1, 2, 4, 5 and 6 of the farm Uitval 280IQ



6. ASPECTS RELATED TO AGRICULTURAL SENSITIVITY

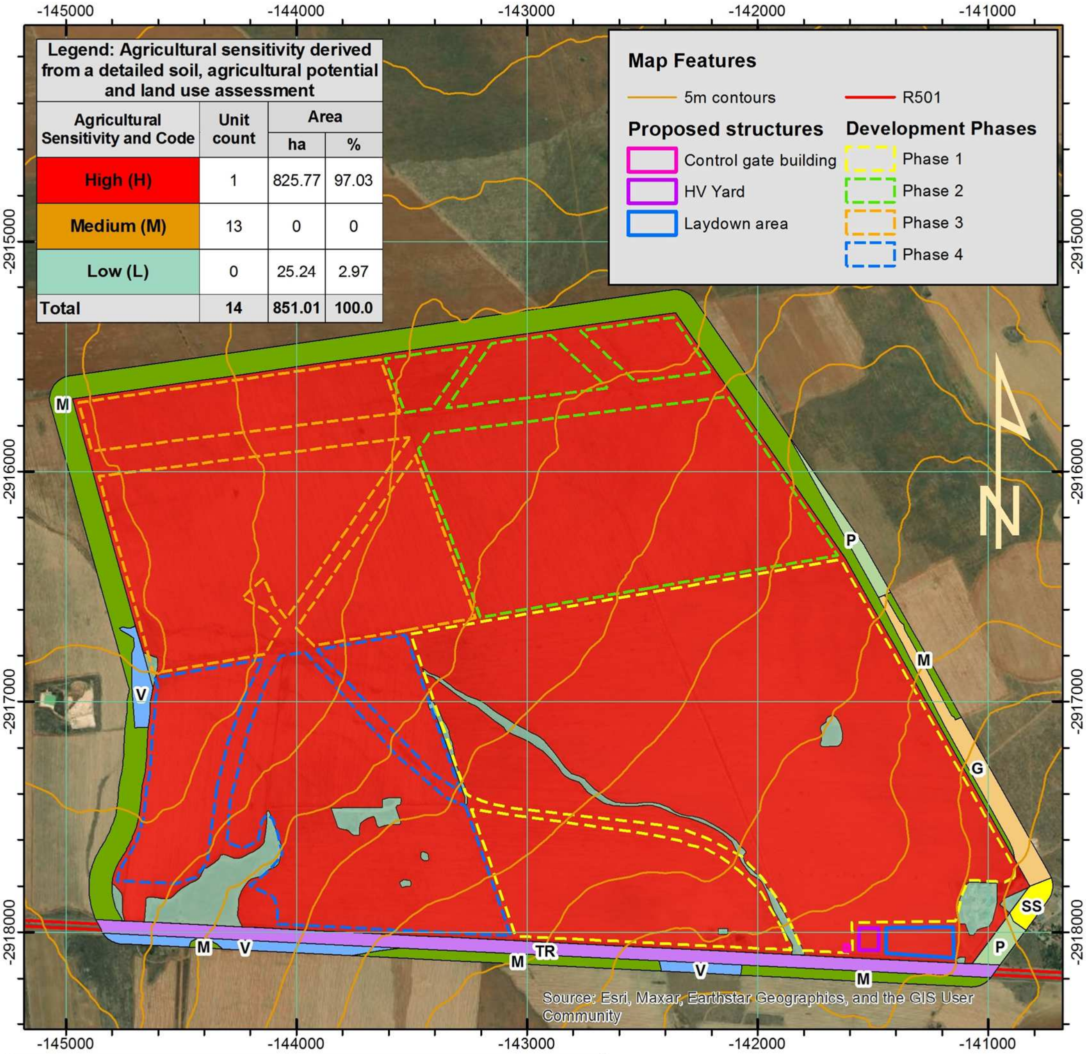
6.1 Development in 100 meter buffered envelope

The Protocol requires a map of the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map as generated by the Screening Tool (Protocol: Table 2, Section 2.6.5). In order to make the land uses more visible on the scale of the map the 50m buffer was increased to 100m.

Since the agricultural sensitivity, as rated by the Screening Tool were found inaccurate, as mentioned, the development in the 100m buffered envelope is overlain on the **refined** agricultural sensitivity classes, as shown in Figures 3b and 8.

Figure 9 shows the land uses in the 100m buffered envelope **surrounding** the proposed development site as well as the refined agricultural sensitivity classes **within** the development site.

Figure 9: Development/land uses within a 100m buffered envelope overlaid on the refined agricultural sensitivity map of the proposed development site



Development/land uses in 100m buffered envelope

Land use code	Land use	Area (ha)	Area (%)
M	Maize	75.93	61.51
P	Pasture	5.26	4.26
G	Grazing	9.38	7.60
V	Vacant	8.94	7.24
TR	Tar road	21.83	17.68
SS	Eskom substation	2.11	1.71
	Total	123.45	100

1:24 000

0 150 300 600 900 1 200 Meters

PROJECTION AND COORDINATE SYSTEM
Projection method: Transverse Mercator
Elipsoid: WG1984, Datum: Hartebeesthoek 1994
Longitude of origin: 29° East

6.1.1 Comparison of development/land uses within the development site to those within the 100 meter buffered envelope

The land uses within the development site are summarized in Table 4 and those within the **100m buffered envelope** in Table 10. The proportions of land uses within the 100m buffered envelope is not always a true reflection of land uses around the development site, although it usually provide a fair indication of the land uses surrounding the development site. Table 10 shows that agricultural related uses in the 100m buffered envelope are dominated by maize, pasture and grazing, which comprises together 73.3% of the 100m buffered envelope.

Table 10: Land uses in 100m buffered envelope

Development/land uses in 100m buffered envelope			
Land use code	**Land use**	**Area (ha)**	**Area (%)**
M	Maize	75.93	61.51
P	Pasture	5.26	4.26
G	Grazing	9.38	7.60
V	Vacant	8.94	7.24
TR	Tar road	21.83	17.68
SS	Eskom substation	2.11	1.71
	Total	**123.45**	**100**

6.2 Land uses on adjacent land parcels

The protocol requires information on the current activities on adjacent land parcels (Protocol: Table 2, section 2.6.9).

Table 11 summarizes the land uses on adjacent land parcels in terms of crop farming, pasture/grazing, mining/industrial and vacant/other.

Table 11: Estimated land uses on adjacent land parcels

Farm name and number	Farm portion and direction in relation to the development site	Estimated percentage land use			
		Crop farming	**Pasture/ Grazing**	**Mining/ Industrial**	**Vacant/ Other**
Blaauwbank 278 IQ	**13** (north)	75	20	0	5
	14 (north)	80	15	0	5
	15 (north)	70	25	0	5
Uitval 280 IQ	**3** (east)	50	50	0	0
	7 (east)	60	35	0	5
	Re (southeast)	10	60	20	10
	9 (south)	85	15	0	0
	8 (south)	90	10	0	0
Driefontein 355IQ	**22** (west)	70	25	0	5

The estimates were made based on aerial photo interpretation (Google Earth satellite Imagery) and only larger, identifiable uses were noted. Smaller uses such as farmsteads and related structures were combined under the heading “Vacant/Other”.

Figure 5 shows that crop farming comprises 96.8% of the development site. It can be derived from Table 11 that crop farming is dominant on all adjacent land parcels and covers more than 60% of all parcels (except Uitval, portion Re), followed by pastures/grazing.

6.3 Agricultural production and annual crop yields

The protocol requires a description of the current productivity of the land based on production figures for all agricultural activities undertaken on the land for the past 5 years, expressed as an annual figure and broken down in production units (Protocol: Table 2, Section 2.4.4).

By evaluating the soil physical and chemical properties as well as climatic conditions of the development site, it is estimated that maize yields during average and good rainfall seasons will vary from 5-7 t/ha/a. Crop yields during poor or very poor rainfall seasons can subsequently varies from 4 t/ha/a to hardly any yields.

Combine harvester yield data of the current lessee was processed by Omnia Nutriology, a member of the Omnia Group and yield maps for the last 3 years (2019-2021) were generated. During the time of the land use assessment the current crop (2022) was not harvested yet. Figure 10 shows an example of the yield map generated from the combine harvester data during 2021.

Figure 10: Yield map from combine harvester data at Uitval - 2021

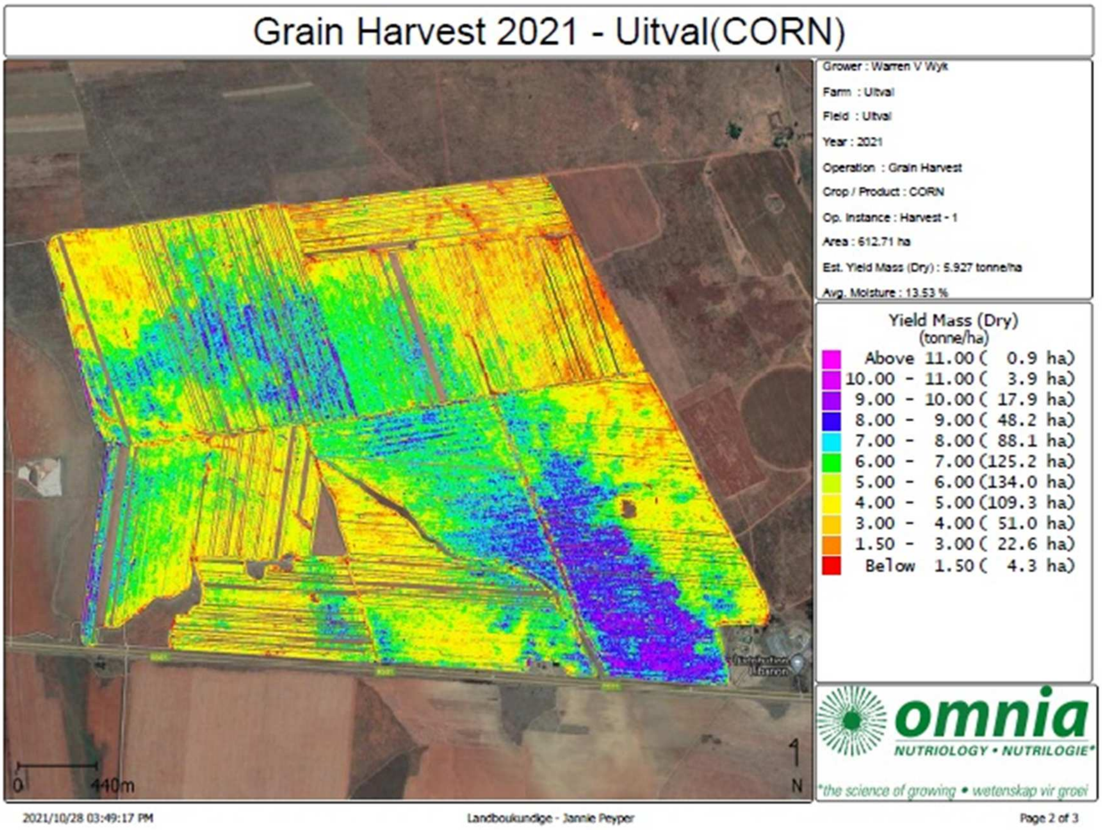


Table 12 shows the average annual maize yields at the development site for the last 3 seasons was 5.4 t/ha, which translates to a total average annual yield of 4 460 tons.

Table 12: Annual crop yield summary from combine harvester data

Year	Farm portions	Field size	Crop	Crop yield t/ha	Total yield t/a
2019	Uitval ptn. 1, 2, 4, 5, 6	826.0	Maize	3.5	2 891
2020	Uitval ptn. 1, 2, 4, 5, 6	826.0	Maize	6.8	5 617
2021	Uitval ptn. 1, 2, 4, 5, 6	826.0	Maize	5.9	4 873
Average				**5.4**	**4 460**

6.4 Annual employment figures

The protocol requires the current employment figures (both permanent and casual) for the land for the past 3 years expressed as an annual figure (Protocol: Table 2, section 2.4.5).

Employment figures were obtained from the current lessee Mr. Warren Van Wyk, via a phone conversation on 26 July 2022.

Table 13: Annual employee figures for the past 3 years

Employees	2019	2020	2021
Permanent	16	14	16
Casual	80 (±40 two time per year)	80 (±40 two time per year)	80 (±40 two time per year)
Annual Total	**96**	**94**	**96**

6.5 Existing impacts on the development site

The protocol requires existing impacts on the site, to be located on a map (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc.) (Protocol: Table 2, section 2.4.6). Existing impacts are a small footprint of an Eskom substation and shallow surface drainage channels that accommodate runoff from the southern side of the tar road (shown on the land use map Figure 5).

7. ENVIRONMENTAL AND AGRICULTURAL IMPACT ASSESSMENT

7.1 Impact description and rating

The impact on soils and land use and subsequent agricultural production is caused by 1 main activity namely: The construction of a 200 MW solar PV facility on productive agricultural land with mainly high agricultural sensitivity. The associated impacts are as follows:

- **Loss of agricultural land** – Long term or permanent loss of productive agricultural land at the footprints where the solar PV facility will be constructed.
- **Loss of agricultural production and food supply** at the total extent of the development site footprint.
- **Potential loss of agricultural job opportunities**

The impact ratings are provided in Tables 14 and 15 below.

Table 14: Impact assessment and rating

ACTIVITY 1: The construction of a 200 MW solar PV facility on productive agricultural land with mainly high sensitivity.									
Nature of the impact	**Significance of potential impact WITHOUT mitigation**						**Mitigation Measures**	**Significance WITH mitigation**	
	Extent	**Duration**	**Intensity**	**Probability**	**Weight**	**Significance**		**Mitigation Efficiency**	**Significance**
Loss of agricultural land – Long term or permanent loss of productive agricultural land and productive capability of the soil at the total extent of the development site, which translates to 851 ha. There are no guarantees when and if the land will go back to agricultural land because electricity generation on site can go on indefinitely. The impact is therefore regarded as permanent.	2 Site	5 Permanent	5 High	5 Definite	5 High	**85 High**	Agricultural production potential will unavoidably cease completely at the actual footprint of the solar facility. Corridors within power line servitudes will be too small and isolated to be utilised effectively for crop farming or livestock, which will cause the entire development site to become unproductive. There are no mitigation measures that can be applied during the operational phase to continue the current agricultural production. The estimated lifespan of the facility will be at least 20 years and there are no guarantees when and if the land will go back to agricultural land. Electricity generation on the development site can go on indefinitely. The impact is therefore regarded as permanent.	1.0 Low	**85 High**
Loss of agricultural production and food supply at the total extent of the development site, which will cause an average annual loss of 4 460 tons of maize in the food supply chain.	2 Site	5 Permanent	5 High	5 Definite	5 Low	**85 High**	There are no mitigation measures that can enable a continuation of crop farming during the operational phase at the development site and the average loss of 4 460 tons of maize in the food supply chain is unavoidable.	1.0 Low	**85 High**
Potential loss of agricultural job opportunities although the farming activities on the development site is part of a larger farming enterprise and	2 site	3 Medium term	3 Medium	2 Possible	4 Medium to high	**40 Medium**	Current employees may still work at the remaining farming enterprise. The proposed development will generate a number of employment opportunities that will certainly exceed the number of jobs that maybe lost.	0.4 Medium to high	**16 Low**

only some of the current employment opportunities may be lost									

Table 15: Impact assessment and rating summary

	Abbreviated impact description	Impact rating before mitigation	Impact rating after mitigation
Activity 1:	The construction of a 200 MW solar PV facility on productive agricultural land with mainly high sensitivity.		
Impact 1	Loss of agricultural land	High	High
Impact 2	Loss of agricultural production and food supply	High	High
Impact 3	Loss of agricultural job opportunities	Medium	Low

7.2 Conclusion in terms in impacts

The significance of impact 1 and 2 is rated as high prior to mitigation and still high after mitigation because the mitigation measures that can be applied during the operation phase are limited with a low efficiency and there are no guarantee that the land will go back to agricultural production at some stage, because electricity generation on the site can go on indefinitely.

Impact 3 is rated as medium because jobs can be lost and job opportunities are scares and the unemployment rate is high. The impact can however be mitigated because the proposed project will create new job opportunities, which renders the impact to low after mitigation.

.

8. ALLOWABLE LIMITS OF THE AGRICULTURAL PROTOCOL

8.1 Calculations of the physical development footprint

The Protocol requires calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development, including supporting infrastructure (Protocol: Table 2, Section 2.6.16)

Figure 4 shows the extents of the 5 farm portions occupied by the development site. It also shows the extents of the development phases and the subsections within each phase as well as the location of supporting infrastructure.

Table 16: Proportions occupied by development phases

Development footprint – Occupied proportions					
Uitval 280 IQ **Portion No**	**Portion area (ha)**	**Development phase and subsections**	**Area occupied by phase sections and total per farm portion (ha)**		****Unoccupied portion area (ha)**
5 and 6	171.4 167.12 **(338.52)**	1.1	252.49	311.7	26.82
		1.2	54.74		
		Supporting infrastructure	4.47		
2	**171.38**	2.1	115.78	143.57	27.81
		2.2	9.31		
		2.3	12.3		
		2.4	6.18		
1	**171.4**	3.1	78.06	139.92	31.48
		3.2	31.33		
		3.3	30.53		
4	**170.08**	4.1	88.31	134.78	35.3
		4.2	15.06		
		4.3	31.41		
Total	**851.38**			**729.97**	**121.41**

**See explanation below

Table 16 shows the total area of each of the 5 farm portions, which translates to a total of 851.38 ha. The table also shows the physical development footprint per farm portion, which translates to a total of 729.97 ha, as well as the unoccupied area per farm portion, which translates to a total of 121.41ha. Note that the unoccupied area per portion as indicated in Table 16 consists of powerline corridors and surface drainage pathways as well as a 20m recess inside all portion boundaries. If the 20m recess is occupied by solar panels, which will probably be the case, the physical development footprint will increase accordingly and the unoccupied area will decrease accordingly.

8.2 Allowable limits of the Protocol

The Protocol (Table 2, Section 2.6.17) requires confirmation whether the development footprint is in line with the allowable development limits set in Table 1, including where applicable, any deviation from the set development limits and motivation to support the deviation, including:

a. where relevant, reasons why the proposed development footprint is required to exceed the limit;
b. where relevant, reasons why this exceedance will be in the national interest; and
c. where relevant, reasons why there are no alternative options available including evidence of alternatives considered; and

The criteria for allowable limits are provided in Table 1 of the Protocol, which is shown as Table 17 below. The allowable limits for agricultural land that can be utilized for wind and solar facilities is firstly based on the Mega Watt (MW) output and further on a combination of the land capability and agricultural sensitivity, subjected to weather the footprint is inside or outside of field crop boundaries.

Table 17: Criteria for allowable limits

Table 1: Allowable development limits for renewable energy generation developments generating electricity of 20 MW or more		
Criteria (land capability evaluation value and category of crop boundary)	Allowable development limits in hectares per MW of installed generation capacity (with sensitivity ratings from the national web based environmental screening tool shown in brackets)	
	Within field crop boundaries	Outside field crop boundaries
Land capability evaluation value of 11 – 15; Irrigation, horticulture/viticulture, shade-net; high value agricultural areas with a priority rating A and/or B	0 (Very High Sensitivity)	0 (Very High Sensitivity)
Land capability evaluation value of 8 – 10; all cultivated areas including sugarcane; high value agricultural areas with a priority rating C and/or D	0.20 (High Sensitivity)	0.35 (Medium Sensitivity)
Land capability evaluation value of 6 - 7;	0.25 (High Sensitivity)	2.50 (Low Sensitivity)
Land capability evaluation value of 1 - 5;	0.30 (High Sensitivity)	2.50 (Low Sensitivity)

The allowable development limits are based on the pre-assessment work undertaken through the Strategic Environmental Assessment for Wind and Solar PV Energy in South Africa, 2015, for the effective and efficient roll-

8.2.1 Calculation of allowable limits for the proposed development site

The total physical development footprint resides within field crop boundaries and within the high agricultural sensitivity class (Figure 8), with the exception of 9 ha. The Protocol allows 0.2 ha per MW within field crop boundaries and within the land capability value 8-10 and high sensitivity category, which translates to 40 ha for the proposed 200 MW facility. Table 16 indicates that the total physical footprint of the proposed 200 MW facility covers 729.97 ha, which implies that the allowable limit of 40 ha is exceeded by 680.97 ha.

8.2.2 Reasons for exceeding allowable limits

The protocol requires reasons why the proposed development footprint is required to exceed the limit (Table 2, Section 2.6.17 a).

From an agricultural production and food security point of view the limit should not be exceeded because the Protocol serves the purpose to prevent the loss of agricultural land due to impacts such as energy generation, to the cost of food production.

The Protocol requires reasons why this exceedance will be in the national interest (Table 2, Section 2.6.17 b).

Electricity generation will be in national interest, especially in the current poor state of governance, however, it would be in nobody's interest to generate electricity but create a food security crisis subsequently.

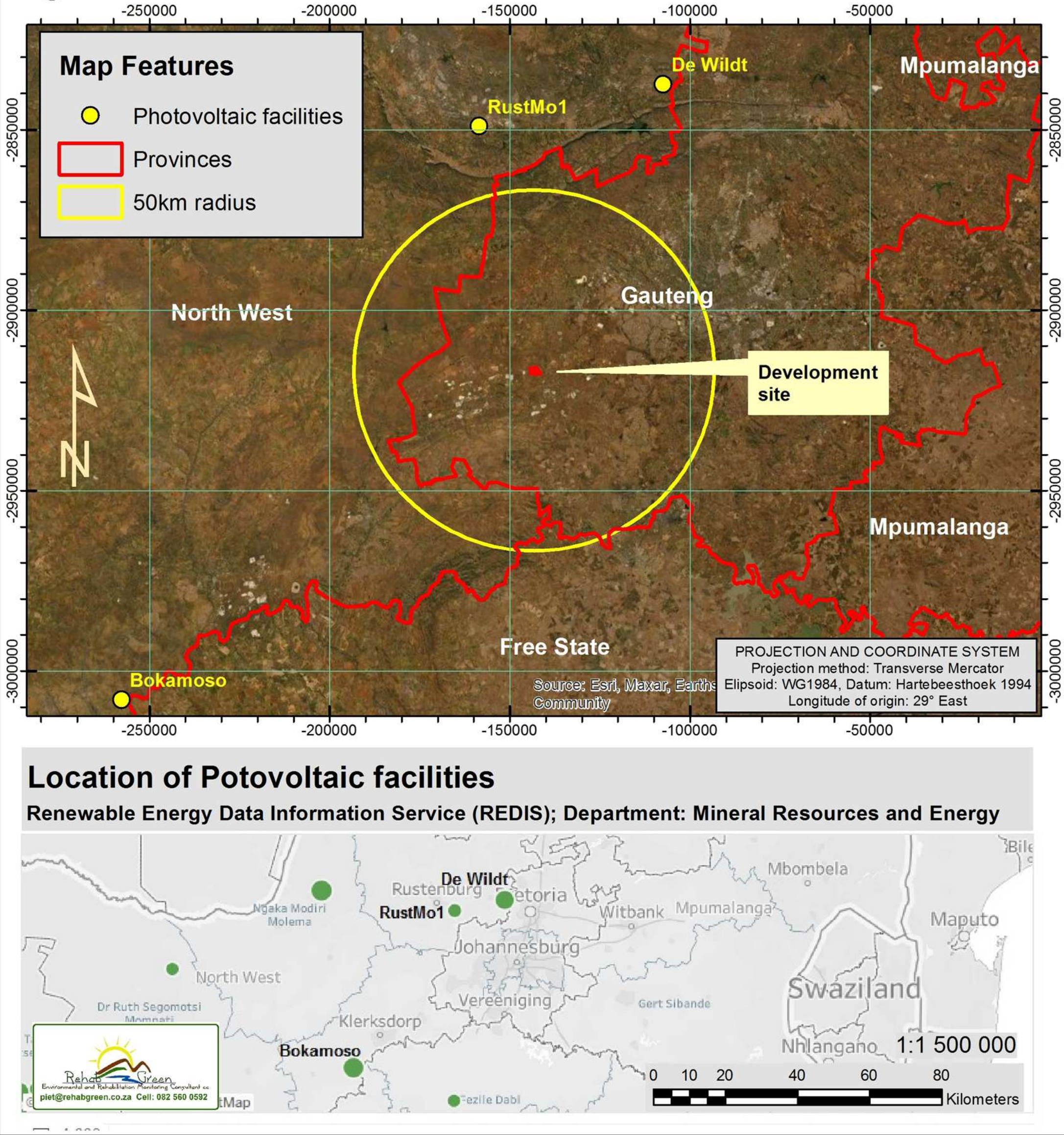
The Protocol requires reasons why there are no alternative options available including evidence of alternatives considered (Table 2, Section 2.6.17 c).

Aurecon South Africa (Pty) Ltd (Aurecon) did a high level screening of 3 alternative sites during 2016 by means of a multi-criteria decision making model. This site (the development site) was selected as the preferred site and the reasoning is compiled in an Aurecon report dated 15 March 2016.

8.2.3 Photovoltaic facilities within a 50km radius

The Protocol requires a map showing the renewable energy facilities within a 50km radius of the proposed development (Protocol: Table 2, Section 2.6.18).

Figure 11: Photovoltaic facilities within 50 km radius



According to a website of the Department of Mineral Resources and Energy, called REDIS (Renewable Energy Data and Information Service), there are no facilities within a 50km radius. Figure 11 shows the 3 photovoltaic facilities nearest to the development site. However, it appears if the website may be out-dated.

9. CONFIRMATIONS AND MOTIVATIONS REQUIRED FROM THE SOIL SCIENTIST

This section addresses specific requirements in Table 2 of the Protocol. The reference to the section of the Protocol and the requirement is indicated by italic text.

9.1 Alternative footprints with medium or low agricultural sensitivity

(Table 2, Section 2.5.3) *any alternative development footprints within the preferred site which would be of "medium" or "low" sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification.*

There are only a few isolated spots in the preferred development site with low agriculture sensitivity, which are included in the planned development footprint.

9.2 Potential losses in production and employment

(Table 2, Section 2.6.6) *an indication of the potential losses in production and employment from the change of the agricultural use of land as a result of the proposed development;*

Maize is the only production unit on the development site. Table 12 indicate that the medium term average annual maize yield is 4 460 tons. Crop farming will cease completely at the development footprint and constitute an average annual loss of 4 460 tons of maize in the food supply chain.

Table 13 indicate that annual employment figures are in the order of 16 permanent employees and 40 casual employees that are hired 2 times per year. The development site is part of a larger farming enterprise and only some employment opportunities may be lost due to the decrease in land to be farmed. However, the proposed development will most probably generate employment opportunities that exceed the potential losses in employment opportunities.

9.3 Long term benefits of the proposed project versus benefits of agriculture

(Table 2, Section 2.6.7) *an indication of possible long term benefits that will be generated by the project in relation to the benefits of the agricultural activities on the affected land;*

Poor governance certainly caused an electricity crisis in the country and any relieve on the national grid are certainly a benefit, especially on the short term, but the question is whether electricity generation on productive agricultural land and to the cost of food production are a long term benefit? The answer is certainly not and the benefit doesn't way up against the benefit of food security, especially if there are areas already impacted by development with subsequent lower agricultural sensitivity.

9.4 Additional environmental impacts expected from proposed development

(Table 2, Section 2.6.8) *additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc.;*

The large number of solar panels will probably cause concentration of water all over the development site, which is a concern in terms of soil erosion. Surface runoff should be controlled by a proper vegetation cover if feasible.

9.5 Alternative sites with medium or low agricultural sensitivity

(Table 2, Sections 2.6.10) *motivation must be provided if there were development footprints identified as per paragraph 2.5.3 above that were identified as having a "low" or "medium" agriculture sensitivity and that were not considered appropriate.*

Sibanye provided 3 alternative sites during 2016 of which 2 of them have sections of reasonable sizes with medium and low agricultural sensitivity. Aurecon South Africa (Pty) Ltd did a high level screening of the 3 alternative sites during 2016 by means of a multi-criteria decision making model. This current development site was selected as the preferred site and the reasoning is compiled in an Aurecon report dated 15 March 2016.

9.6 Fragmentation of agricultural activities

(Table 2, Section 2.6.11*) confirmation from the soil scientist or agricultural specialist that all reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities;*

The proposed development site is surrounded by agricultural land and mainly by crop farming and the solar facility will therefore, unavoidably, cause a significant fragmentation, discontinuation and disturbance of agricultural activities. A screening was done by Aurecon during 2016 on 3 alternative sites that are all owned by Sibanye. The current development site was chosen as the preferred site although both of the other 2 sites had fairly lower agricultural sensitivity. It can be accepted that a screening was done on Sibanye owned land, but it would not be unreasonable to suggest that a screening should be done on other portions, which are situated within a reasonable distance and position. It should be considered that there may be areas close by that may have lower agricultural sensitivity or even have high agricultural potential but are not productive, due to existing impacts and would thus not cause a decrease in food production.

9.7 Acceptability of the impact

(Table 2, Section 2.3.2) whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site, and in the event where it does, whether such an impact is outweighed by the positive impact of the proposed development on agricultural resources.

Discussed in section 9.8

9.8 Substantiated statement on approval or not

(Table 2, Section 2.6.12) *substantiated statement from the soil scientist or agricultural specialist with regards to agricultural resources on the acceptability or not of the proposed development and a recommendation on the approval or not of the proposed development;*

The Agricultural Protocol was compiled, promulgated and gazetted to prevent the loss of critical agricultural resources and ensure food security via agricultural production and simultaneous support sustainable development. The Protocol, however, allows the sacrificing of agricultural land but only to a sensible degree.

Unfortunately, agricultural resources in South Africa suffered a serious negative blow by opencast mining on the Eastern Highveld, where estimated over a 100 000 ha were mined and not rehabilitated to arable standards. The impact accumulated in small fractions over time and the effect was therefore initially not noticed, later on noticed but ignored until it recently, when the impact became severe.

What is of real concern is that South Africa is currently at the initial stage of large scale transformation from coal energy generation to renewable energy generation. This poses a serious thread of a continuation of agricultural land to be sacrificed for energy generation, but within the new expanding industry of renewable energy. A continuing negative impact on agricultural resources can cause food security to reach a critical limit, especially considering the current tumbling global markets.

The advantage is that renewable energy, especially solar facilities, is highly feasible in large areas of the country that coincide with low agricultural sensitivity, such as millions of hectares in the Karoo, where the productivity of the land are in the order of 1 sheep per 10 ha, comparing to 5.5 tons of maize on a single hectare. The conflict between fossil electricity generation and food production on the Eastern Highveld led to a serious loss of highly productive agricultural land and can be avoided to a large extent in the renewable energy industry. This flexibility makes it even more compulsory to ensure that all possibilities during a site selection are investigated and land with the lowest impact on agriculture is selected.

Figure 9 and Table 11 indicate that agriculture is dominant on all adjacent land parcels. A PV facility on the development site will thus unavoidably cause fragmentation, discontinuation and disturbance agricultural activities. Fragmentation of agricultural land is a serious impact that disrupts the stability of agriculture, even in a macro agricultural unit and mostly tends to accumulate unavoidably, especially if it commences with the magnitude of the planned facility (851 ha). Therefore, preventing this impact from initiation is crucial for survival of agricultural production.

By applying the criteria of the Protocol, only 40 ha of highly sensitive agricultural land can be sacrificed for renewable energy generation, as calculated in Section 8.2.1. Approval of the facility will exceed the allowable limit by 681 ha, which translates to exceeding the limit by 17 times. Considering that the development site does not consist of unproductive, high potential land, but productive, high potential land (high potential land can be productive or vacant), exceeding the limit by 17 times is not acceptable under almost all circumstances. Allowing this exeedance will furthermore create a precedent that can be used to abuse and disregard the purpose of the Protocol and its criteria in future.

It is assumed that 1 large continuous facility would be more desirable and may be more cost effective in terms of construction. However, sacrificing 851 ha of highly sensitive agricultural land and 4 460 tons of maize annually is not acceptable and not in line with the purpose of the Protocol or the principles of sustainable development, unless all potential alternatives were thoroughly assessed and the preferred site is found to be the only option.

Agricultural production will cease completely for the lifespan of the facility, which period is most likely linked to the life of Sibanye's operations. However, there is no reason to believe that the demand for electricity in the country will decrease and electricity generation on the site will most probably go on indefinitely, which cause the impact to be regarded permanent. There is thus no guarantee that the site will go back to agricultural production somewhere in the future.

The long term benefits of preserving the agricultural productivity of the development site will most probably outweigh the challenges and/or cost of constructing a facility, consisting of 2 or more discontinuous sections, residing on lower sensitive land, which subsequently constitute sustainable development. A further effort to obtain sites with lower agricultural impacts is therefore recommended.

Considering the above, the impact on agricultural resources is not acceptable and approval of the current facility footprint is therefore not supported. From an agriculture point of view further screening of potential sites is recommended. The following is recommended and/or brought to attention:

- A footprint that can accommodate the magnitude of the proposed facility without impacting various environmental aspects including agriculture will be hard to find and therefore the possibility of smaller multiple units within the same vicinity should be considered.
- A facility of the same or larger magnitude maybe considered in a more remote region of the country with low sensitivity.
- Two of the alternative sites that were screened during the 2016 assessment can be considered for a smaller multiple unit facility.
- The remaining extent of Uitval can be considered.
- The remaining extent of as Libanon and Witkleigat (south and north of the large tailings facility) is a very large area that appears to have good potential.

9.9 Conditions subjected to the statement above

(Table 2, Section 2.6.13) *any conditions to which this statement is subjected.*

The statement in section 9.8 is subjected to:

- A thorough assessment of the feasibility of smaller photovoltaic units because smaller units may have advantages and disadvantages but can easier be located on areas with lower agricultural sensitivity.
- An initial desktop assessment of potential alternative areas mentioned in Section 9.8 followed by a ground-truth exercise.

9.10 Considerations for authorities with regard to environmental authorization

Sibanye Stillwater is committed to sustainable development and follows a positive approach to environmental impacts as stated in their official biodiversity and land management position statements.

Sibanye also support 11 agricultural related projects under their social and labour plans.

Sibanye is driving a project, which are referred to as the Bokamoso Ba Rona Agri-Industrial development, which is a project that propose integrated initiatives for agricultural, industrial, residential and commercial development for a 30 000 ha footprint within the West Rand region.

9.11 Monitoring requirements and mitigation measures for inclusion in the EMPr

(Table 2, Section 2.6.14) *where identified, proposed impact management outcomes or any monitoring requirements and/or mitigation measures for inclusion in the Environmental Management Programme (EMPr);*

Potential soil erosion that may occur due to uneven concentration of water by the panels should be monitored on a frequent basis and occurrences of erosion should be stabilized as soon as it occurs.

9.12 Assumptions and uncertainties or gaps in knowledge or data

(Table 2, Section 2.6.15) *a description of the assumptions made and any uncertainties or gaps in knowledge or data;*

The duration of the impact by the proposed facility on agriculture is unknown because it is argued that the lifespan of the facility cannot really be predicted. Circumstance can change in numerous ways for example the facility can be sold to other stakeholders at any time and it would thus be the saver option to assume that the impact will be permanent.

10. CONCLUSION

The overall conclusion is summarized in Sections 9.8 and 9.9 and 9.10

REFERENCES

Fertilizer Society of South Africa, 2007. FSSA Fertilizer Handbook, 6th rev. ed. FSSA, Pretoria.

Non-Affiliated Soil Analysis Work Committee, 1990. Handbook of Standard Soil Testing Methods for Advisory Purposes. Soil Science Society of South Africa, Pretoria.

Soil Classification Working Group, 1991. Soil Classification – a Taxonomic System for South Africa. Memoirs on the Agricultural Natural Resources of South Africa No. 15. Department of Agricultural Development, Pretoria.

Soil Science Society of South Africa, 1990. South African National Biodiversity Institute . 2012 Vegetation Map of South Africa, Lesotho and Swaziland [vector geospatial dataset] 2012. Available from the Biodiversity GIS website, downloaded on 18 June 2021.

Steenekamp, P.I., 2016. Soil and Agricultural Potential Assessment of the alternative sites for the proposed Sibanye Gold Photovoltaic Energy Facility. Rehab Green Monitoring Consultants, Pretoria, unpublished report No. RG/2015/04/28/1.

Van der Watt, H.v.H and Van Rooyen T. H, 1990. A Glossary of Soil Science. Soil Science Society of South Africa, Pretoria.

APPENDIX A
SOIL CLASSIFICATION SYSTEM

The classification system categorizes soil types in an upper soil Form level which is subdivided into a number of lower Family levels. Each soil Form (higher level) is defined by a unique vertical sequence of soil horizons with specific defined properties. The soil Families (lower level) are a subdivision of the soil Form (higher level), differentiated on the basis of specific characteristics such as leaching status, calcareousness, structure types and sizes etc.

In this way, standardised soil identification and communication is allowed by use of soil Form names and family numbers or names e.g. Hutton 2100 or Hutton Hayfield. The soil Form and soil Family together are referred to as soil types.

The soil Forms are indicated by the name and the Family by its appropriate number e.g. Hutton 2100. The soil Form and Family are then symbolized e.g. Hu and referred to as soil type Hu. The soil Form and Family are often further categorized based on effective soil depth, terrain unit and slope and a numerical number is added to the symbol e.g. Hu1. For example, where the Hutton 2100 soil Form and Family occurs at an effective depth of 900-1200 mm, it is symbolized and referred to as soil type Hu1, and where this soil Form and Family occurs at an effective depth of 600-900 mm it is symbolized and referred to as soil type Hu2.

APPENDIX B
SOIL PROPERTIES AND CHARACTERISTICS

Various terms in the soil legend are used to describe a series of soil properties and characteristics such as the dominant soil Form and Family, effective soil depth, internal drainage, and clay content per soil horizon and texture class.

1. Effective soil depth

Effective soil depth can be considered as the depth freely permeable to plant roots and water. Effective soil depth categories used in the soil legend are as follows:

Very shallow	< 300 mm
Shallow	300-600 mm
Moderately deep	600-900 mm
Deep	900-1500 mm
Very deep	> 1500 mm

2. Internal drainage

Internal drainage is the flow of water (annual precipitation) through the soil profile. Soils with the ability to drain annual precipitation though the profile without waterlogged periods within certain parts of the profile are called **well-drained** soils. Soils which lack this ability will display properties indicating temporary to permanent water logged conditions in parts of the soil profile in the form of mottling, leaching or gleying.

Moderately well-drained soils mostly display impeded internal drainage in the lower profile e.g. soft plinthic horizons, which is the result of periodically fluctuating water tables which are characterized by mottling and accumulation of iron and manganese oxides.

Imperfectly drained soils mostly display impeded internal drainage in the upper and lower parts of the profile e.g. E and plinthic horizons, which is the result of periodic lateral flow of water in the profile and fluctuating water tables. Such soils are characterized by grey, leached, sandy horizons and mottled plinthic horizons.

Poorly drained soils mostly display impeded internal drainage in the upper and lower parts of the soil profile e.g. E, plinthic and G-horizons and are the result of long term to permanent wetness in the soil profile, which is characterized by grey, leached, sandy horizons, mottled plinthic horizons and gleyed clay horizons.

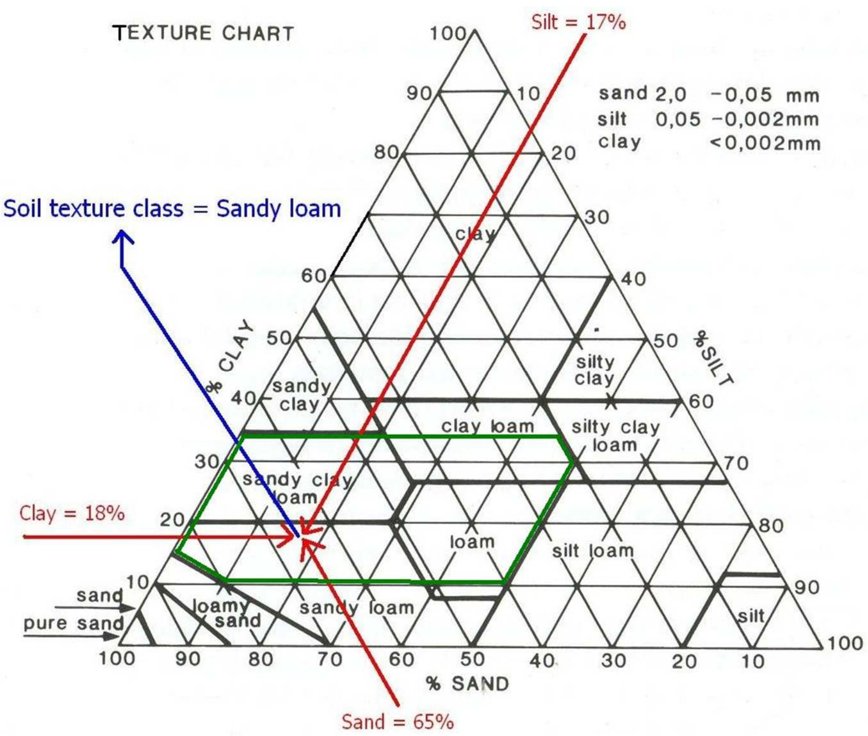
3. Texture class

Soil texture refers to the relative proportions of the various particle size separates in the soil. Particle sizes are defined in the following **fractions**.

Sand – (2.0 – 0.05 mm)
Silt – (0.05 – 0.002 mm)
Clay – (< 0.002 mm)

The relative proportions of these 3 fractions (as illustrated by the red arrows in Figure B1) determines 1 of 12 soil texture classes e.g. sandy loam, loam, sandy clay loam etc. The different texture class zones are demarcated by the thick black lines in the diagram. The green zone can be used as a guideline for moderate to high agricultural potential, but needs to be evaluated together with other soil properties.

Figure B1: Soil texture chart



APPENDIX C
COORDINATES OF SOIL SAMPLING POINTS

Table C1: Coordinates of soil sampling points

Coordinates of Soil Sampling Points				
Soil sampling point	**Projected Coordinate System** **Ellipsoid:** WGS 1984 **Coordinate system:** LO27 **Datum:** Hartebeesthoek 1994		**Geographic Coordinate System** **Ellipsoid:** WGS 1984 **Datum:** Hartebeesthoek 1994	
	X (m)	Y (m)	X/Lat (dd)	Y/Long (dd)
P327	57762.17	-2917295.01	-26.364028	27.578732
P426	56358.25	-2915982.33	-26.352236	27.564609
P427	57485.83	-2916551.82	-26.357331	27.57593

APPENDIX D
ORIGINAL LABORATORY REPORT

INSTITUTE FOR SOIL, CLIMATE AND WATER

INSTITUUT VIR GROND, KLIMAAT EN WATER

Page 1 of 1

ARC • LNR

Client : P STEENEKAMP
Klient :

POSBUS 12636
QUEENSWOOD
0121

Tel :
Fax / Faks :
Date / Datum : 2022-07-21

RESULTS FOR REPORT No:
RESULTATE VIR VERSLAG Nr BOERE 202223 15768
Rep. / Verteenw.:

Farmer / Boer : P STEENEKAMP

Method Used / Metode Gebruik -->		P-Bray 1	Amm. Acetate									Water		
LabNo	Sender ID	P	K	K	Ca	Ca	Mg	Mg	Na	Na	R	pH	T. Acid / T. Suur	SA/SV
		mg/kg	mg/kg	me/100g	mg/kg	me/100g	mg/kg	me/100g	mg/kg	me/100g	ohm		cmol(+)/kg	%
V 306	P327	56.3	88	0.2251	554	2.7645	182	1.4979	5.5	0.0239	2420	6.14	0	
V 307	P426	97.4	82	0.2097	488	2.4351	169	1.3909	5.3	0.0231	2520	6.16	0	
V 308	B427	6.2	95	0.2430	645	3.2186	201	1.6543	5.2	0.0226	2200	5.78	0	

APPENDIX E

1. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

1.1 Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines (DEAT, 1998) and as amended from time to time (DEAT, 2002)

The level of detail as depicted in the EIA Guidelines (DEAT, Environmental Impact Assessment Guidelines., 1998) (DEAT, Impact Significance, Integrated Environmental Management, Information series 5., 2002)) was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.

Table 0-1: Impact Assessment Criteria

EXTENT	
Classification of the physical and spatial scale of the impact	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
DURATION	
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
Short to Medium term	The impact will be relevant through to the end of a construction phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.
Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.
- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including construction, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

1.1.1 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

1.1.1.1 Determination of Significance-Without Mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

Table 0-2: Significance-Without Mitigation

NO SIGNIFICANCE	The impact is not substantial and does not require any mitigation action.
LOW	The impact is of little importance, but may require limited mitigation.
MEDIUM	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
HIGH	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

1.1.1.2 Determination of Significance- With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

Table 0-3: Significance- With Mitigation

NO SIGNIFICANCE	The impact will be mitigated to the point where it is regarded as insubstantial.
LOW	The impact will be mitigated to the point where it is of limited importance.
LOW TO MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
MEDIUM TO HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

1.1.2. Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

1.1.2.1. Ranking, Weighting and Scaling

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 0-4). The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 0-4: Description of assessment parameters with its respective weighting

EXTENT		**DURATION**		**INTENSITY**		**PROBABILITY**		**WEIGHTING FACTOR (WF)**		**SIGNIFICANCE RATING (SR)**	
Footprint	1	Short term	1	Low	1	Improbable	1	Low	1	Low	0-19
Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100

MITIGATION EFFICIENCY (ME)		**SIGNIFICANCE FOLLOWING MITIGATION (SFM)**	
High	0.2	Low	0 - 19
Medium to High	0.4	Low to Medium	20 - 39
Medium	0.6	Medium	40 - 59

Low to Medium	0.8	Medium to High	60 - 79
Low	1.0	High	80 - 100

1.1.2.2 Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

1.1.2.3 Identifying the Potential Impacts With Mitigation Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

1.1.2.3.1 Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating (refer to *Table 0-4*). The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency

or WM = WOM x ME

1.1.2.4 Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

(DEAT, 2002)

Finally, the impact assessment must refer to the residual and latent impact after successful implementation of the management measures.

APPENDIX F
PROTOCOL WIND AND SOLAR – AGRICULTURE ASSESSMENT

Published in Government Notice **No. 320** GOVERNMENT GAZETTE **43110** 20 MARCH 2020
GAZETTED FOR IMPLEMENTATION

AGRICULTURE

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS OF ENVIRONMENTAL IMPACTS ON AGRICULTURAL RESOURCES BY ONSHORE WIND AND/OR SOLAR PHOTOVOLTAIC ENERGY GENERATION FACILITIES WHERE THE ELECTRICITY OUTPUT IS 20 MEGAWATTS OR MORE

1. SCOPE

This protocol provides the criteria for the specialist assessment and reporting of impacts on agricultural resources for activities requiring environmental authorisation, for onshore wind and/or solar photovoltaic (PV) energy generation facilities where the electricity output is 20 megawatts or more. This protocol replaces the requirements of Appendix 6 of the Environmental Impact Assessment Regulations[1].

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, which is based on the land capability evaluation values as provided by the Department responsible for agriculture[2].

The screening tool can be accessed at: https://screening.environment.gov.za/screeningtool.

2. ALLOWABLE DEVELOPMENT LIMITS

Table 1: Allowable development limits for renewable energy generation developments generating electricity of 20 MW or more

Criteria (land capability evaluation value and category of crop boundary)	**Allowable development limits in hectares per MW of installed generation capacity (with sensitivity ratings from the national web based environmental screening tool shown in brackets)**	
	Within field crop boundaries	Outside field crop boundaries
Land capability evaluation value of 11 – 15; Irrigation, horticulture/viticulture, shade-net; high value agricultural areas with a priority rating A and/or B	0 (Very High Sensitivity)	0 (Very High Sensitivity)
Land capability evaluation value of 8 – 10; all cultivated areas including sugarcane; high value agricultural areas with a priority rating C and/or D	0.20 (High Sensitivity)	0.35 (Medium Sensitivity)
Land capability evaluation value of 6 - 7;	0.25 (High Sensitivity)	2.50 (Low Sensitivity)
Land capability evaluation value of 1 - 5;	0.30 (High Sensitivity)	2.50 (Low Sensitivity)

The allowable development limits are based on the pre-assessment work undertaken through the Strategic Environmental Assessment for Wind and Solar PV Energy in South Africa, 2015, for the effective and efficient roll-

[1] The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998).
[2] Refer to the land capability metadata sheet available on the national web based environmental screening tool.

out of large scale wind and solar development in South Africa. The pre-assessment was undertaken in specific areas referred to as the Renewable Energy Development Zones (REDZs) as published under Government Notice No. 114, Gazette No. 41445 on 16 February 2018 and extrapolated to cover the entire country. The sensitivities were refined through further public consultation and stakeholder interaction and have been captured in the screening tool.

Allowable development limits refer to the area of a particular land capability that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. Physical footprint in this context is the area that is directly occupied by all infrastructure, including roads, hard standing areas, buildings, substations, etc. that is associated with the renewable energy generation facility during its operational phase, and that result in the exclusion of that land from potential cultivation or grazing. It excludes all areas that were already occupied by roads and other infrastructure prior to the establishment of the renewable energy facility, but includes the surface area required for expanding existing infrastructure (e.g. widening existing roads). It excludes the corridor underneath overhead power lines, but includes the pylon footprints. It therefore represents the total land that is actually excluded from agricultural use as a result of the renewable energy facility.

The Strategic Environmental Assessment for Wind and Solar PV Energy in South Africa, 2015 can be accessed at: https://redzs.csir.co.za/?page_id=611 and https://egis.environment.gov.za/redz.

3. SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking a **site sensitivity verification**.

3.1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

3.2. The site sensitivity verification must be undertaken through the use of:
- (a) a desk top analysis, using satellite imagery;
- (b) a preliminary on-site inspection; and
- (c) any other available and relevant information.

3.3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
- (a) confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
- (b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- (c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

4. SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 2: ASSESSMENT AND REPORTING OF IMPACTS ON AGRICULTURAL RESOURCES
1. General Information 1.1. An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "very high" or "high" sensitivity for agricultural resources must submit an **Agricultural Agro-Ecosystem Specialist Assessment,** unless:

Published in Government Notice **No. 320** GOVERNMENT GAZETTE **43110** 20 MARCH 2020

GAZETTED FOR IMPLEMENTATION

<table>
<tr><td colspan="2">
1.1.1. the application includes a linear activity for which impacts to the agricultural resource are temporary and the land in the opinion of the soil scientist or agricultural specialist, based on the mitigation and remedial measures, can be returned to the current land capability within two years of the completion of the construction phase;
1.1.2. the impact on agricultural resources is from an electricity pylon; or
1.1.3. information gathered from the site sensitivity verification differs from the designation of "very high" or "high" agricultural sensitivity, and it is found to be of a "medium" or "low" sensitivity.

1.2. Should paragraphs 1.1.1; 1.1.2; or 1.1.3 apply, an Agricultural Compliance Statement must be submitted.

1.3. An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "medium" or "low" sensitivity for agricultural resources must submit an Agricultural Compliance Statement unless:
1.3.1. the information gathered from the site sensitivity verification differs from that identified as having a "medium" or "low" agricultural sensitivity and it is found to be of a "very high" or "high" sensitivity; or
1.3.2. where the development footprint deviates from any of the allowable development limits contained in Table 1 above. In the context of this protocol, development footprint means the area on which the proposed development will take place and includes any area that will be disturbed.

1.4. Should either paragraphs 1.3.1 or 1.3.2 apply, an Agricultural Agro-Ecosystem Specialist Assessment is to be undertaken and a report prepared in accordance with the requirements of an Agro-Ecosystem Specialist Assessment.

1.5. If any part of the proposed development footprint falls within an area of "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity apply to the entire footprint, except in the case of 1.1.1 in which case an Agricultural Compliance Statement applies.
</td></tr>
<tr><td>
VERY HIGH SENSITIVITY RATING - Land capability evaluation values of 11 – 15; all irrigated land; horticulture and viticulture; demarcated high value agricultural areas with a priority rating of A and/or B.

These areas are potentially unsuitable for development owing to:
- high agricultural value and preservation importance;
- high production capability;
- high capital investment made; and/or
- unique agricultural land attributes.
</td><td>
2. Agricultural Agro-Ecosystem Specialist Assessment

2.1. The assessment must be undertaken by a soil scientist or agricultural specialist registered with the South African Council of Natural Scientific Professionals (SACNASP).

2.2. The assessment must be undertaken on the preferred site and within the proposed development footprint.

2.3. The assessment must be undertaken based on a site inspection as well as an investigation of the current production figures, where the land is under cultivation or has been within the past 5 years, and must identify:
2.3.1. the extent of the impact of the proposed development on the agricultural resources; and
2.3.2. whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site, and in the event where it does, whether such an impact is outweighed by the positive impact of the proposed development on agricultural resources.
</td></tr>
<tr><td>
HIGH SENSITIVITY RATING - Land capability evaluation values of 8 - 10 including all cultivated
</td><td>
2.4. The assessment must include a description of the status quo, including the following aspects which must be considered as a minimum in the baseline description of the agro-ecosystem:
</td></tr>
</table>

areas[3] including sugar cane areas and demarcated high value agricultural areas with a priority rating of C and/or D. High sensitivity areas are still preservation worthy since they include land with an agricultural production potential and suitability for specific crops.	2.4.1. the soil form/s, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit and slope; 2.4.2. the soil form, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit and slope; 2.4.3. where applicable, the vegetation composition, available water sources as well as agro-climatic information; 2.4.4. the current productivity of the land based on production figures for all agricultural activities undertaken on the land for the past 5 years, expressed as an annual figure and broken down into production units; 2.4.5. the current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure; and 2.4.6. existing impacts on the site, located on a map (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc.). 2.5. The assessment must include an assessment of impacts, including the following aspects which must be considered as a minimum in the predicted impact of the proposed development on the agro-ecosystem: 2.5.1. change in productivity for all agricultural activities based on the figures of the past 5 years, expressed as an annual figure and broken down into production units; 2.5.2. change in employment figures (both permanent and casual) for the past 5 years expressed as an annual figure; and 2.5.3. any alternative development footprints within the preferred site which would be of "medium" or "low" sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification. 2.6. The findings of the Agricultural Agro-Ecosystem Specialist Assessment must be written up in an **Agricultural Agro-Ecosystem Specialist Report** that contains as a minimum the following information: 2.6.1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vitae; 2.6.2. a signed statement of independence by the specialist; 2.6.3. the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment; 2.6.4. a description of the methodology used to undertake the on-site assessment inclusive of the equipment and models used, as relevant; 2.6.5. a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool; 2.6.6. an indication of the potential losses in production and employment from the change of the agricultural use of land as a result of the proposed development; 2.6.7. an indication of possible long term benefits that will be generated by the project in relation to the benefits of the agricultural activities on the affected land; 2.6.8. additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc.;

[3] The Field Crop boundary and Land Capability dataset has been provided by DAFF. For details of the datasets, click on the options button to the right of the Field Crop Boundary layer and Land Capability layer respectively, in the Agricultural Theme to view the metadata.

	2.6.9. information on the current agricultural activities being undertaken on adjacent land parcels; 2.6.10. a motivation must be provided if there were development footprints identified as per paragraph 2.5.3 above that were identified as having a "low" or "medium" agriculture sensitivity and that were not considered appropriate; 2.6.11. confirmation from the soil scientist or agricultural specialist that all reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities; 2.6.12. a substantiated statement from the soil scientist or agricultural specialist with regards to agricultural resources on the acceptability or not of the proposed development and a recommendation on the approval or not of the proposed development; 2.6.13. any conditions to which this statement is subjected; 2.6.14. where identified, proposed impact management outcomes or any monitoring requirements and/or mitigation measures for inclusion in the Environmental Management Programme (EMPr); 2.6.15. a description of the assumptions made and any uncertainties or gaps in knowledge or data; 2.6.16. calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development (including supporting infrastructure); 2.6.17. confirmation whether the development footprint is in line with the allowable development limits set in Table 1 above, including where applicable any deviation from the set development limits and motivation to support the deviation, including: a. where relevant, reasons why the proposed development footprint is required to exceed the limit; b. where relevant, reasons why this exceedance will be in the national interest; and c. where relevant, reasons why there are no alternative options available including evidence of alternatives considered; and 2.6.18. a map showing the renewable energy facilities within a 50km radius of the proposed development. 2.7. The findings of the **Agricultural Agro-Ecosystem Assessment** must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which are to be contained in the EMPr. 2.8. A signed copy of the full Agricultural Agro-Ecosystem Assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

MEDIUM SENSITIVITY RATING - Land capability evaluation values of 6 – 7. Medium sensitivity areas are likely to be very marginal arable land.	**3. Agricultural Compliance Statement** 3.1. The **Agricultural Compliance Statement** must be prepared by a soil scientist or agricultural specialist registered with the SACNASP. 3.2. The compliance statement must: 3.2.1. be applicable to the preferred site and proposed development footprint; 3.2.2. confirm that the site is of "low" or "medium" sensitivity for agriculture; and 3.2.3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. 3.3. The **Agricultural Compliance Statement** must contain, as a minimum, the following information: 3.3.1. details and relevant expertise as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae; 3.3.2. a signed statement of independence by the specialist; 3.3.3. a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool; 3.3.4. calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure; 3.3.5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 above; 3.3.6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities; 3.3.7. a substantiated 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; 3.3.8. any conditions to which this statement is subjected; 3.3.9. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase; 3.3.10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and 3.3.11. a description of the assumptions made and any uncertainties or gaps in knowledge or data. 3.4. A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.