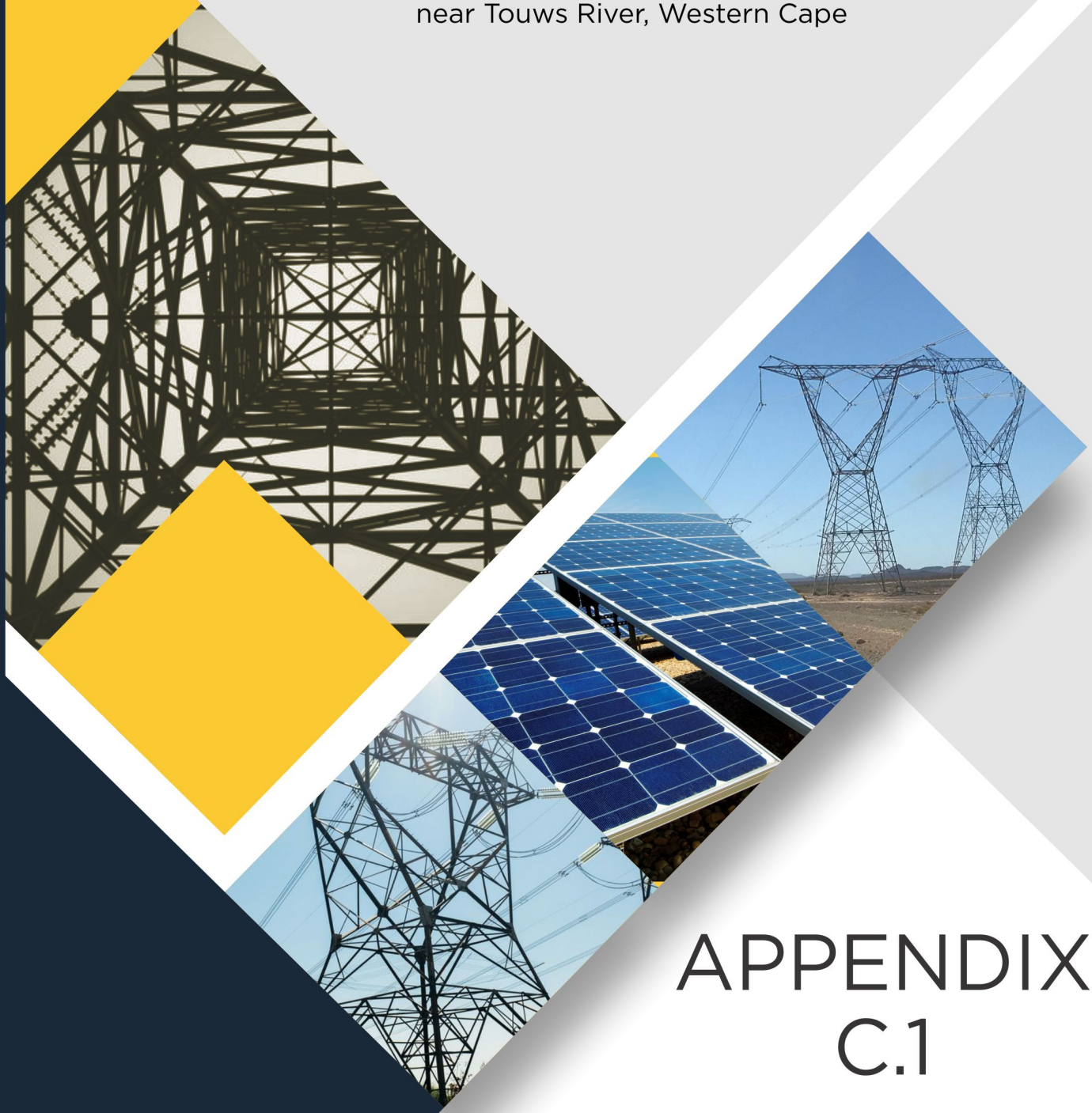
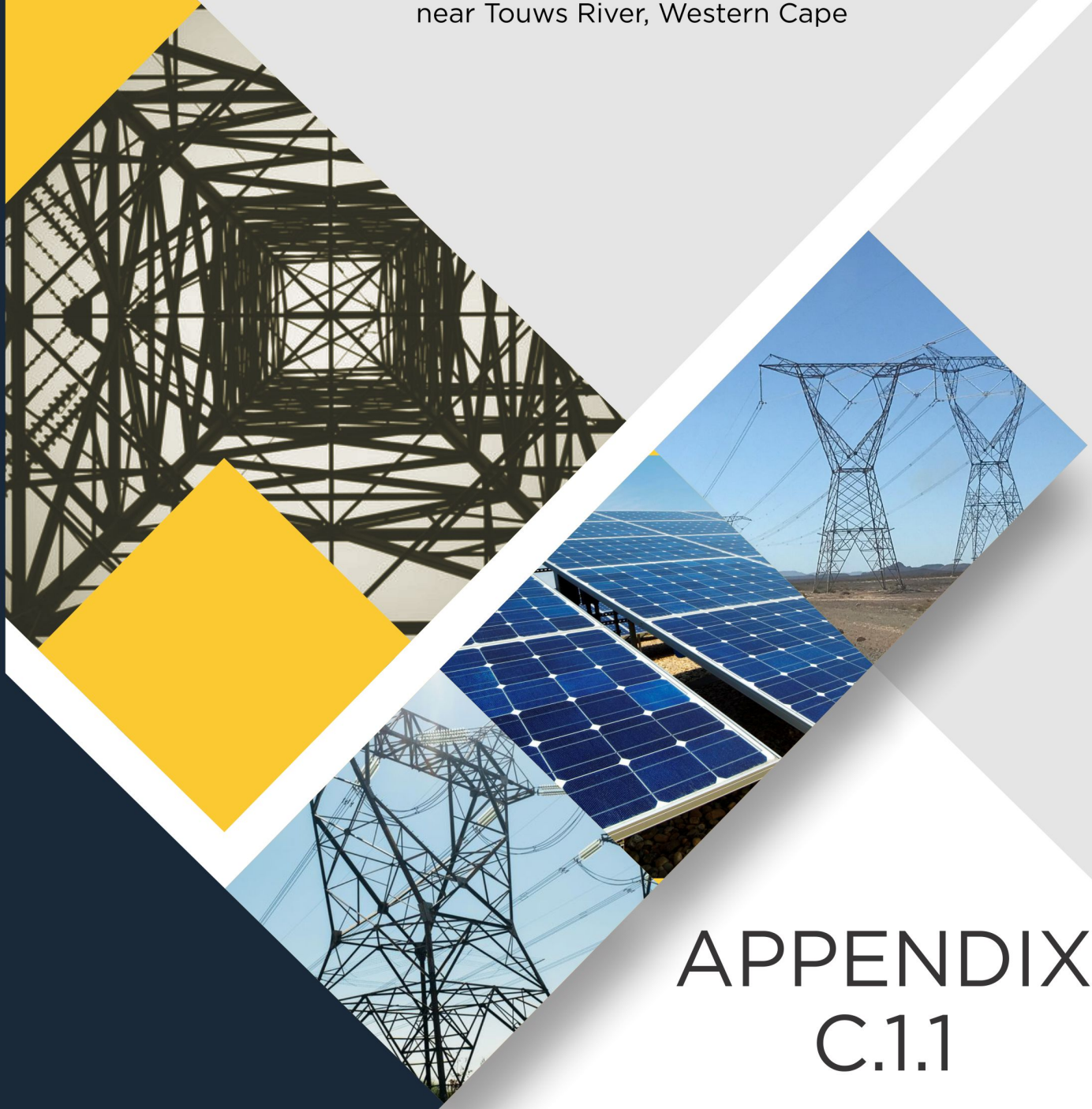
Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape



APPENDIX C.1

Agriculture Compliance Statement

Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape



APPENDIX C.1.1

Agriculture Compliance Statement for Witte Wall

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SITE SENSITIVITY VERIFICATION AND AGRICULTURAL COMPLIANCE STATEMENT FOR THE PROPOSED WITTE WALL 1 AND 2 SOLAR PV FACILITIES AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Report by
Johann Lanz

29 September 2020

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EXECUTIVE SUMMARY

The key findings of this study are:

- The aridity of the area is a significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible across the site.
- Soils include a high proportion of shallow, rocky soils on underlying rock.
- As a result of these limitations, the study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The majority of land within the development area is classified as low agricultural sensitivity, but includes smaller patches of medium sensitivity.
- Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.
- The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.
- The conclusion of this assessment is that the proposed development (2 x 175MW solar photovoltaic (PV) plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.
- From an agricultural impact point of view, it is recommended that the proposed development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the proposed Witte Wall 1 and 2 solar photovoltaic (PV) facilities and their associated electrical grid infrastructure, approximately 35 km north-north-west of Touws River, Western Cape Province (see Figure 1). This report provides all of the inputs required by the *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*, gazetted on 20 March 2020 in Government Notice (GN) 320 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA), 1998). Johann Lanz was appointed as an independent agricultural specialist to provide these inputs.

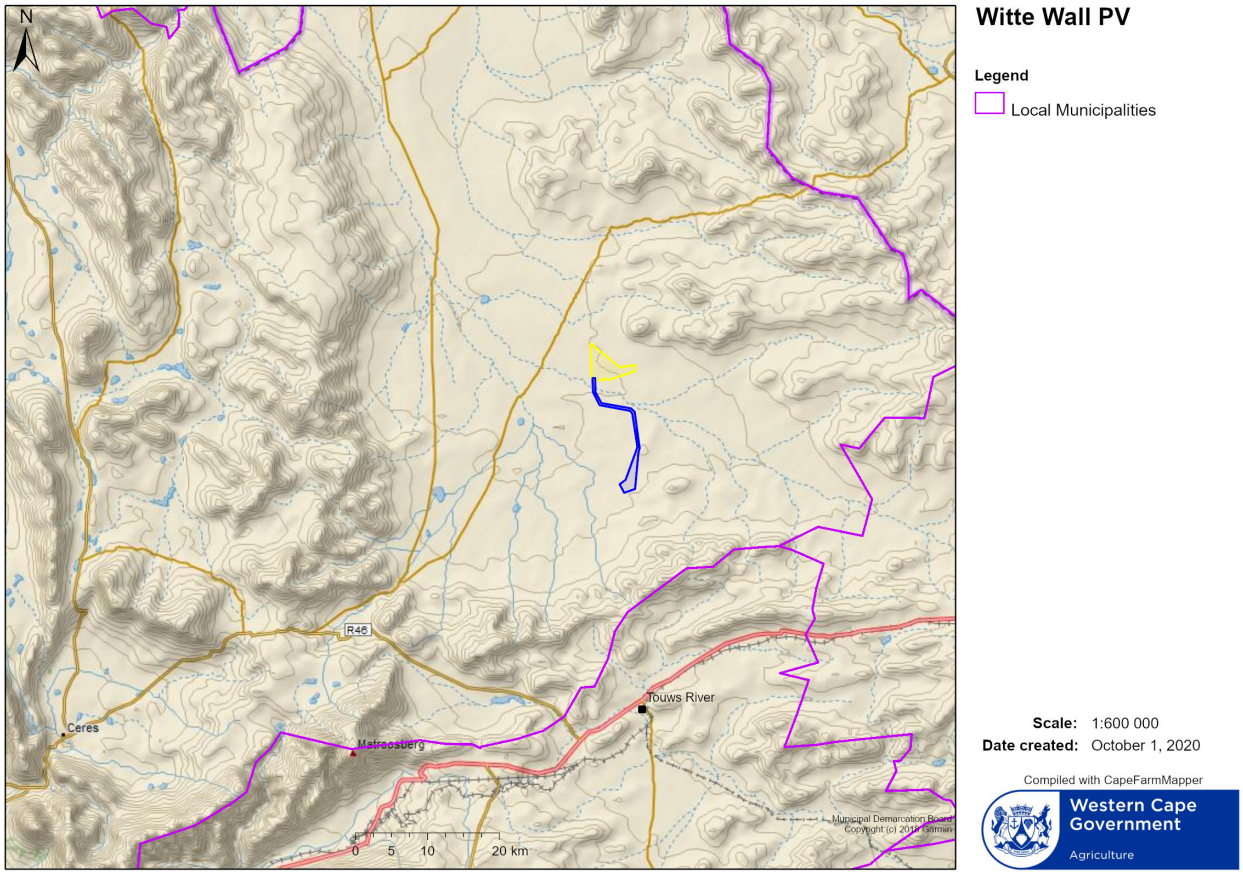

Figure 1. Locality map of the site, with the Witte Wall PV project study area in yellow and electrical grid infrastructure corridor in blue.

2 PROJECT DESCRIPTION

The proposed two PV developments will each have a capacity of 175MW. They will consist of the standard infrastructure of a PV facility including, but not limited to, PV arrays (which may require

clearing of all vegetation under panels); onsite substation; 132 kV overhead power line to the Eskom Kappa substation; a battery energy storage system (BESS); offices; operation and maintenance (O&M) building; construction laydown area; access roads; panel maintenance and cleaning area, and security fencing and lighting.

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land and whether it is being occupied by a solar panel, a road, a building or a substation makes no difference. What is of most relevance and addressed in this assessment, therefore, is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land.

The proposed development falls entirely within Renewable Energy Development Zone (REDZ) 2, namely the Komsberg REDZ.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *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*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The proposed site is identified by the national web-based environmental screening tool (hereafter referred to as “Screening Tool”) as being of low and medium sensitivity for agricultural resources, and the protocol therefore requires that the level of agricultural assessment be an Agricultural Compliance Statement. The protocol also requires that a Site Sensitivity Verification be done.

The protocol states that an Agricultural Compliance Statement must be prepared by a competent soil scientist/agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP).

The compliance statement must:
(The section of this report that fulfils each requirement is given in brackets after it)

1. be applicable to the preferred site and proposed development footprint;
2. confirm that the site is of “low” or “medium” sensitivity for agriculture (Section 7); and
3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (Section 9.9).

It must contain, as a minimum, the following information:

1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vita (CV) (Appendix 2);
2. a signed statement of independence by the specialist (Appendix 3);
3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (Figure 2);
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 (Section 9.8);
5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol (Section 9.8);
6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (Section 9.6);
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 (Section 9.8);
8. any conditions to which this statement is subjected (Section 11);
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 (Section 9.7);
10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 10); and
11. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing soils and agricultural potential

This report adheres to the process and content requirements of the gazetted agricultural protocol as outlined in Section 3 above. As per the requirement, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site.

The following sources of information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- Field crop boundaries were sourced from the national web-based environmental screening tool.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Satellite imagery of the site and surrounds was sourced from Google Earth.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

The study makes the assumption that water for irrigation is very limited in the study area. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist. Only very minimal irrigation water has been exploited.

There are no other specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long term lease associated with the renewable energy facility be approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD).

Power lines require the registration of a servitude for each farm portion crossed. In terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA, the registration of a power line servitude requires written consent of the Minister if the following two conditions apply:

1. if the servitude width exceeds 15 metres; and
2. if Eskom is not the applicant for the servitude.

If one or both of these conditions do not apply, then no agricultural consent is required. Eskom is currently exempt from agricultural consent for power line servitudes.

The SALA consent is separate from the application for Environmental Authorisation that is currently underway in terms of Basic Assessments (BAs), and needs to be applied for and obtained separately.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). No application is required in terms of CARA. The BA process covers the required aspects of this.

7 SITE SENSITIVITY VERIFICATION

In terms of the gazetted agricultural protocol (GN 320), a site sensitivity verification must be submitted that:

1. 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.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability.

The screening tool classifies agricultural sensitivity according to two criteria - the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the screening tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-

arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017 DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. This land capability data is used by the screening tool.

The proposed site is identified by the screening tool as being of predominantly low sensitivity for agricultural resources, but it also includes patches of medium sensitivity. A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 2 and 3 below.

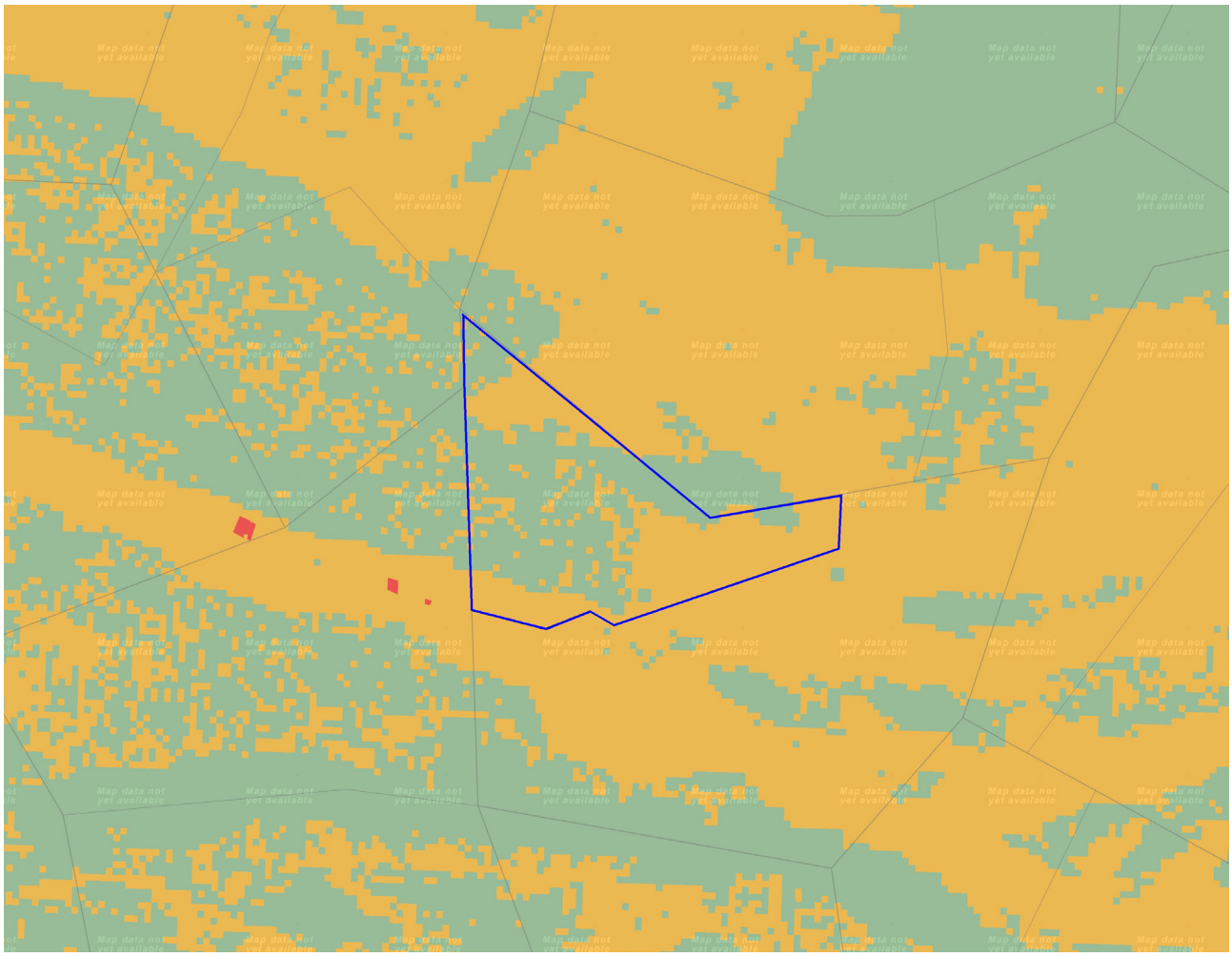

Figure 2. The PV project study area (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

The agricultural capability of all land in the study area is severely constrained by the aridity of the climate. The further basis for the agricultural sensitivity classification of land within the site is summarised in Table 1.

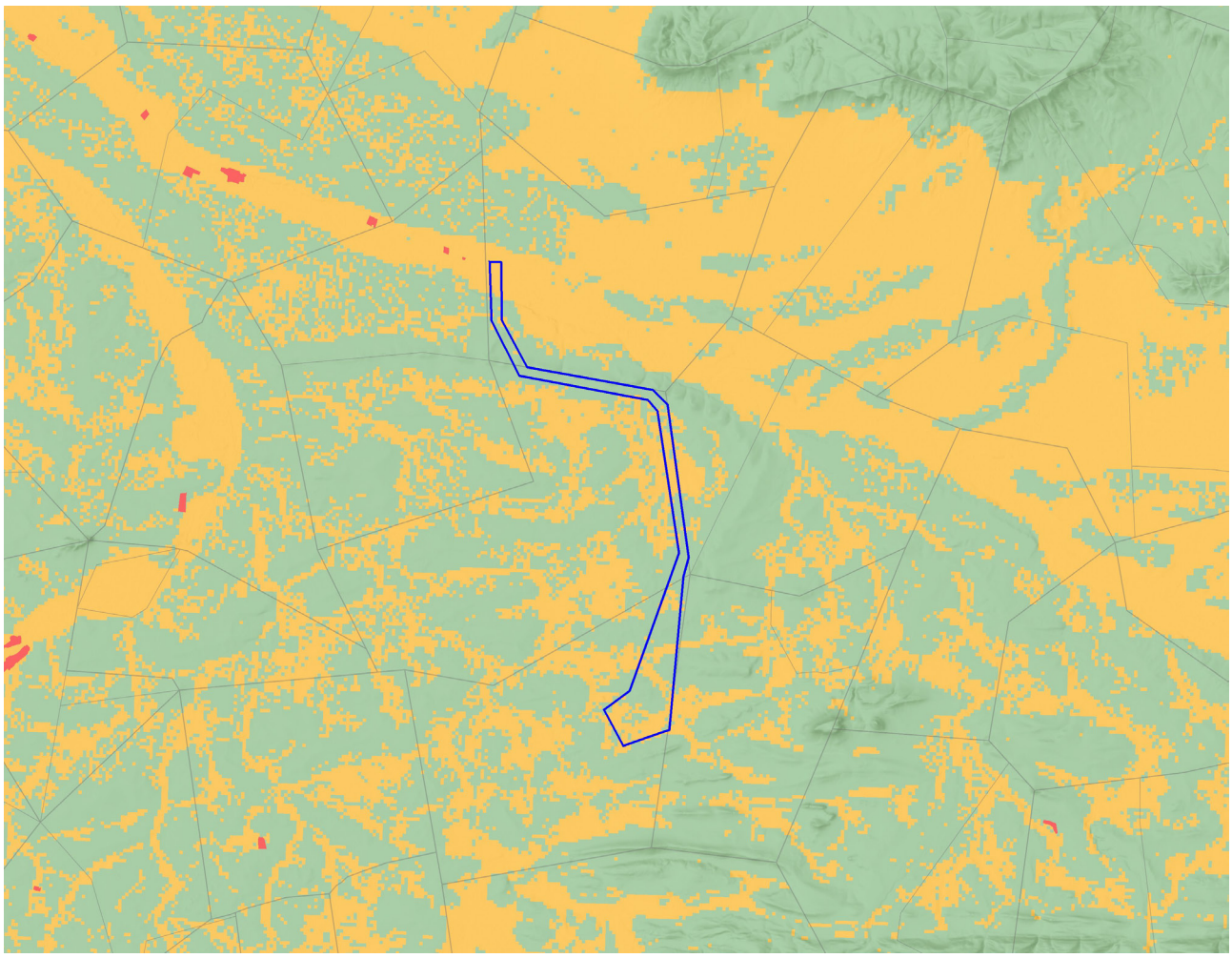

Figure 3. The electrical grid infrastructure corridor (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

Table 1: Description of different agricultural sensitivity classes that occur in the study area.

Sensitivity category	**Cultivation status**	**Land capability evaluation values**	**General description**
Low	Uncultivated	2 to 5	Constrained by aridity. Also constrained by shallow, rocky soils on underlying hard or weathering rock.
Medium	Uncultivated	6 to 7	Constrained by aridity. Less rocky alluvial soils along drainage lines.

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment. The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall of approximately 200 mm per annum and high evaporation of approximately 1,500 mm per annum) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be shallow, rocky soils, with limited pedological development on hard

or weathering underlying rock. The land of the study area, therefore, without doubt, corresponds to the definitions of the different screening tool sensitivity categories in terms of its land capability and cultivation status.

8 AGRICULTURAL LAND USE

The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. Witte Wall farm only has game. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 General

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or potential future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or potential future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base pose a threat to production and therefore are within the scope of an agricultural impact assessment. Lifestyle impacts on the resident farming community, for example visual impacts, do not necessarily impact agricultural production and, if they do not, are not relevant to and within the scope of an agricultural impact assessment.

For agricultural impacts, the exact nature of the different infrastructure within a facility has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a PV panel or a substation makes no difference. What is of most relevance therefore is simply the total footprint of the facility.

The components of the project that can impact on agriculture are:

1. Occupation of the land by the total, direct, physical footprint of the proposed project including all its infrastructure.
2. Construction activities that may disturb the soil profile and vegetation, for example for levelling, excavations, etc.

The significance of all potential agricultural impacts is kept low by the fact that the proposed site is on land of extremely limited agricultural potential that is only viable for low density grazing.

Electrical grid infrastructure has negligible agricultural impact in this study area for two reasons:

1. Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines.
2. The direct, permanent, physical footprint of the electricity grid infrastructure that has any potential to interfere with agriculture is restricted to pylon bases and substation footprints that, in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

9.2 Direct impacts for Witte Wall 1, Witte Wall 2, and their associated electrical grid infrastructure

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to the Witte Wall 1 and Witte Wall 2 PV Facilities, and all their electrical grid and other associated infrastructure:

1. **Loss of agricultural land use** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
2. **Soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

9.3 Cumulative impacts of Witte Wall 1, Witte Wall 2, and their associated electrical grid infrastructure

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

the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

> What level of loss of agricultural land use and associated loss of agricultural production is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

DEFF requires compliance with a specified methodology for the assessment of cumulative impacts. This is positive in that it ensures engagement with the important issue of cumulative impacts. However, the required compliance has some limitations and can, in the opinion of the author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

DEFF compliance for this project requires considering all renewable energy projects within a 30 km radius that have received an EA at the time of starting this BA (i.e. by August 2020). It is assumed that each renewable energy project consists of an EGI component. There are eleven other renewable energy project applications within 30km of the proposed site. These are listed in Appendix 1 of this report. In addition, there are nine separate PV projects (with a total of nine power lines, substations and BESS's) associated with the current development and these have also been included in the consideration of cumulative impact in this report.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the nine developments plus the other eleven renewable energy developments (total generation capacity of 4,003 MW) will amount to a total of approximately 5,097 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 1.80% of the surface area. That is within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in

the country. This is particularly so when considered within the context of the following point:

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

Because of the negligible agricultural impacts of electrical grid infrastructure, the agricultural environment can accommodate far more electricity grid infrastructure than currently exists, or is currently proposed, before acceptable levels of change are exceeded.

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

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

9.4 Comparative assessment of alternatives

Due to the low agricultural sensitivity of the site, and the effectively uniform agricultural conditions across the site, it is highly likely that there will be no material difference between the agricultural impact of any possible, alternative layouts on the site.

9.5 Impacts of the no-go alternative

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential such impact is that due to continued low rainfall in the area, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability.

Although the development offers an alternative income source to agriculture, it does exclude agriculture from the impacted land. Therefore, the agricultural impact of the no-go alternative, which does not exclude agriculture, is less significant than the agricultural impact of the development, and so, purely from an agricultural impact perspective, the no-go is the preferred

alternative between the development and the no-go. But the development offers a land use with much higher income generating capacity than any viable agricultural land use on the site.

9.6 Micro-siting to minimize fragmentation and disturbance of agricultural activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. It is therefore unnecessary to check whether siting of infrastructure, and any layout of infrastructure within the assessed area is acceptable in terms of agricultural impact.

9.7 Confirmation of linear activity impact

The electrical grid infrastructure is a linear activity. The protocol states that if the activity is a linear one, in which, 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, then the level of agricultural assessment required by the protocol is an Agricultural Compliance Statement. However, in this case, the agricultural sensitivity of the site is less than high, and therefore, regardless of whether the activity is linear or not, only an Agricultural Compliance Statement is required. Confirmation of the linear activity impact is therefore not required in this case.

9.8 Impact footprint

The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy 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 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.

It is hereby confirmed that the final layout, and associated agricultural footprint, will be well within the allowable limit of 2.5 ha per MW (175 MW x 2.5 = 437.5 ha), as per the DEFF protocols. The final agricultural footprint of each project will be in the order of 260 hectares.

9.9 Impact statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development (2 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

The environmental management programme inputs for the protection of soil resources are presented in the tables below for each phase of the development.

Table 2: Management plan for the planning and design phase

Impact	**Mitigation / management objectives and outcomes**	**Mitigation / management actions**	**Monitoring**		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and	Design an effective system	Ensure that the storm water	Once-off during the design	Holder of the EA

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
	existence of hard surfaces causes no erosion on or downstream of the site.	of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	run-off control is included in the engineering design.	phase.	

Table 3: Management plan for the construction phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water	Every 2 months during the construction phase	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the construction phase	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	Check that topsoil covers the entire disturbed area.		

Table 4: Management plan for the operational phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That existence of hard surfaces causes no erosion on or downstream of the site.	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective	Bi-annually	Facility Environmental Manager

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
			action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 5: Management plan for the decommissioning phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation,	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		the stockpiled topsoil must be evenly spread over the entire disturbed surface.			

11 CONCLUSIONS

The site has very low agricultural potential because of, predominantly, aridity constraints, but also due to soil constraints. It is generally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The majority of land within the development area is of low agricultural sensitivity, but it includes areas of medium sensitivity.

Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.

The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.

The conclusion of this assessment is that the proposed development (2 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.

From an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

12 REFERENCES

Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

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APPENDIX 1: PROJECTS INCLUDED IN CUMULATIVE ASSESSMENT

The table below shows the renewable energy facilities only, as the associated power line projects within the 30 km radius have a negligible impact from an agricultural perspective.

DEA Reference	Title	Technology	MegaWatts
14/12/16/3/3/1/1976	Kudusberg WEF	Wind	325
12/12/20/1783/1	Perdekraal 1	Wind	150
12/12/20/1783/2	Perdekraal 2	Wind	150
12/12/20/1787[1]	Konstabel	Wind	85
12/12/20/1787	Konstabel	Solar PV	85
12/12/20/1956	Touwsrivier	Solar PV	36
12/12/20/1988	Roggeveld Wind Farm	Wind	750
14/12/16/3/3/2/899	Rietkloof	Wind	36
14/12/16/3/3/2/810	Montague Road	Solar PV	75
14/12/16/3/3/2/900	Brandvalley WEF	Wind	147
14/12/16/3/3/1/1984	Tooverberg WEF	Wind	264
14/12/16/3/3/2/1115	Rondekop WEF	Wind	325
Sub-Total (Authorised Projects)			**2428**
Pending	Proposed Ceres PV Development (9 PV Facilities)	Solar PV	**1575**
Sub-Total (Current Projects)			**1575**
Total (Authorised and Current Projects)			**4003**

[1] The National REEA states that the project is 170 MW and consists of Wind and Solar technology. For purposes of this cumulative assessment for agricultural impacts, it has been assumed that 85 MW is assigned to Solar and 85 MW to Wind.

APPENDIX 2: SPECIALIST CURRICULUM VITAE

Johann Lanz
Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting **Self employed** **2002 - present**

In the past 5 years of running my soil and agricultural consulting business, I have completed more than 120 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, urban, and agricultural developments. My regular clients include: Aurecon; CSIR; SiVEST; Arcus; SRK; Environamics; Royal Haskoning DHV; Jeffares & Green; JG Afrika; Juwi; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant **Agricultural Consultors International (Tinie du Preez)** **1998 - 2001**

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist **De Beers Namaqualand Mines** **July 1997 - Jan 1998**

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine.*

I am a reviewing scientist for the *South African Journal of Plant and Soil*.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPENDIX 3: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

THE PROPOSED WITTE WALL 1 AND 2 SOLAR PV FACILITIES AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
- All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001
Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Johann Lanz – Soil Scientist			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Johann Lanz			
Specialist Qualifications:	M.Sc. (Environmental Geochemistry)			
Professional affiliation/registration:	Registered Professional Natural Scientist Member of the Soil Science Society of South Africa			
Physical address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal code:	7800	Cell:	082 927 9018	
Telephone:	082 927 9018	Fax:	Who still uses a fax? I don't	
E-mail:	johann@johannlanz.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, declare that -

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company:

29/09/2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company

29/09/2020

Date

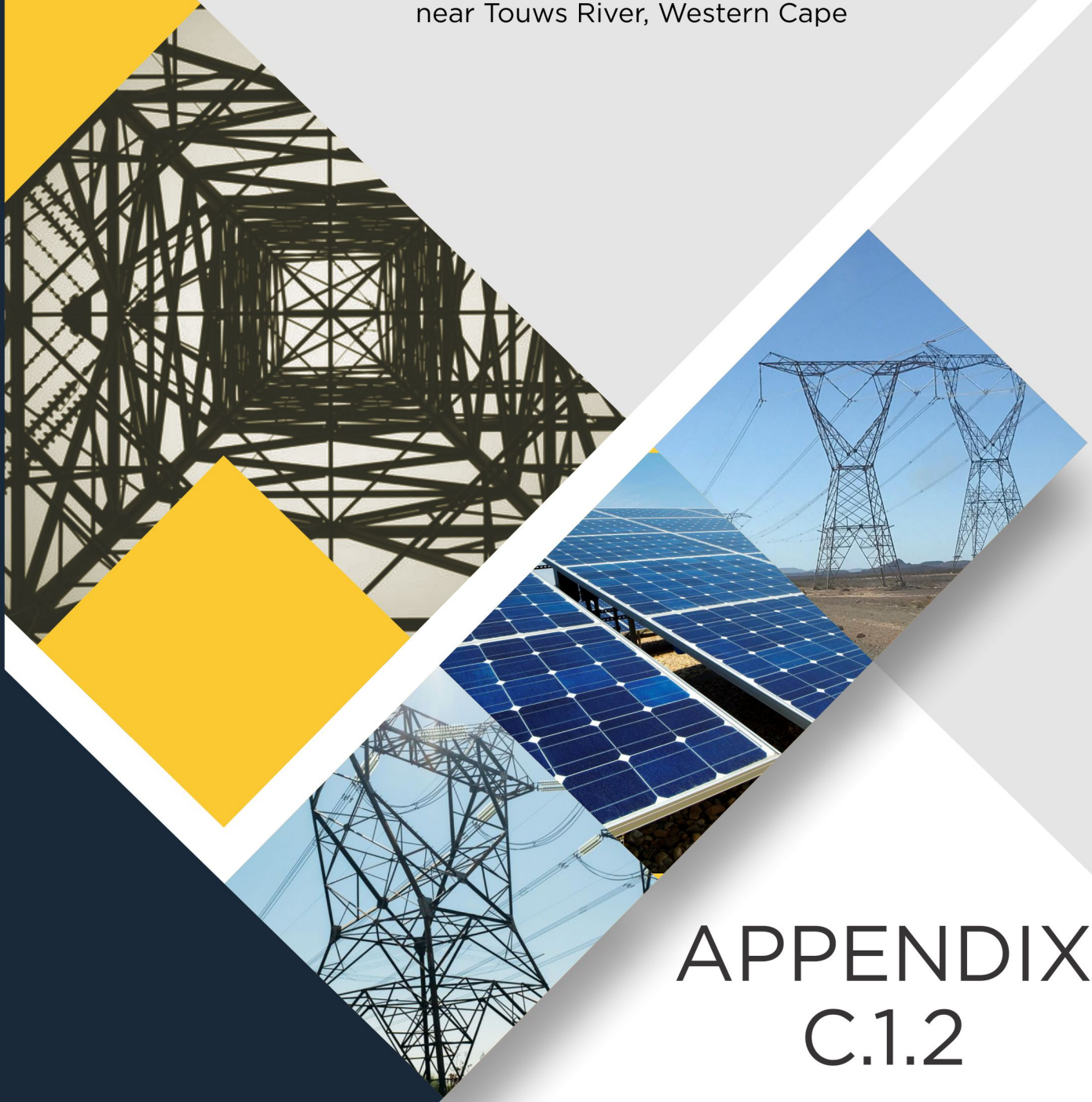
Signature of the Commissioner of Oaths

2020·09·29

Date

SUID-AFRIKAANSE POLISIEDIENS
STATION COMMANDER
29 SEP 2020
SOUTH AFRICAN POLICE SERVICE

Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape



APPENDIX C.1.2

Agriculture Compliance Statement for Grootfontein

Johann Lanz
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SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR
THE PROPOSED GROOTFONTEIN 1, 2 AND 3 SOLAR PV FACILITIES AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Report by
Johann Lanz

29 September 2020

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EXECUTIVE SUMMARY

The key findings of this study are:

- The aridity of the area is a significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible across the site.
- Soils include a high proportion of shallow, rocky soils on underlying rock.
- As a result of these limitations, the study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The majority of land within the development area is classified as low agricultural sensitivity, but includes smaller patches of medium sensitivity.
- Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.
- The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.
- The conclusion of this assessment is that the proposed development (3 x 175MW solar photovoltaic (PV) plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.
- From an agricultural impact point of view, it is recommended that the proposed development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the proposed Grootfontein 1, 2 and 3 solar photovoltaic (PV) facilities and their associated electrical grid infrastructure, approximately 35 km north-north-west of Touws River, Western Cape Province (see Figure 1). This report provides all of the inputs required by the *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*, gazetted on 20 March 2020 in Government Notice (GN) 320 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA), 1998). Johann Lanz was appointed as an independent agricultural specialist to provide these inputs.

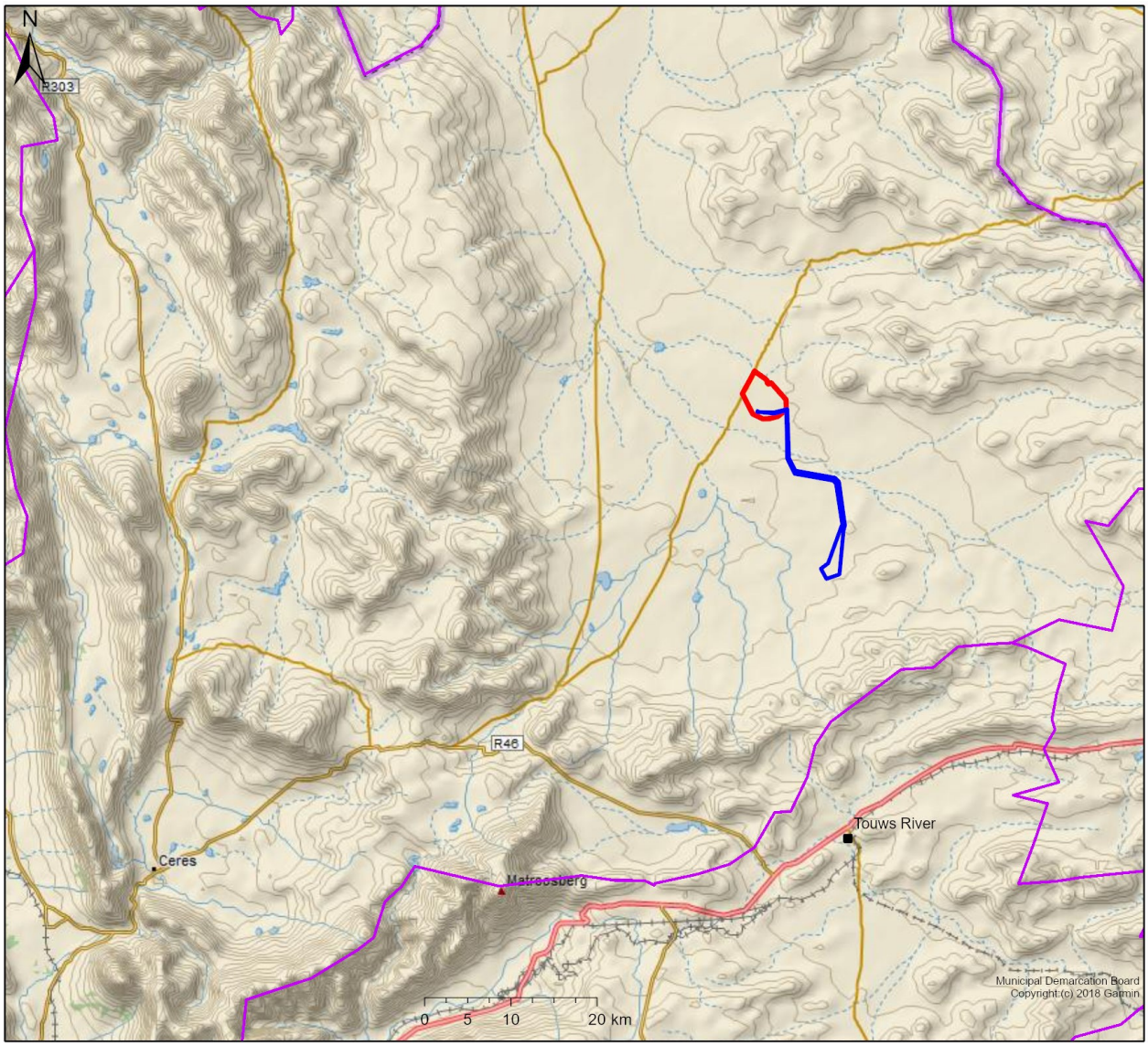

Figure 1. Locality map of the site, with the Grootfontein PV project study area in red and electrical grid infrastructure corridor in blue.

2 PROJECT DESCRIPTION

The proposed three PV developments will each have a capacity of 175MW. They will consist of the standard infrastructure of a PV facility including, but not limited to, PV arrays (which may require clearing of all vegetation under panels); onsite substation; 132 kV overhead power line to the Eskom Kappa substation; a battery energy storage system (BESS); offices; operation and maintenance (O&M) building; construction laydown area; access roads; panel maintenance and cleaning area, and security fencing and lighting.

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land and whether it is being occupied by a solar panel, a road, a building or a substation makes no difference. What is of most relevance and addressed in this assessment, therefore, is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land.

The proposed development falls entirely within Renewable Energy Development Zone (REDZ) 2, namely the Komsberg REDZ.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *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*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The proposed site is identified by the national web-based environmental screening tool (hereafter referred to as “Screening Tool”) as being of low and medium sensitivity for agricultural resources, and the protocol therefore requires that the level of agricultural assessment be an Agricultural Compliance Statement. The protocol also requires that a Site Sensitivity Verification be done.

The protocol states that an Agricultural Compliance Statement must be prepared by a competent soil scientist/agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP).

The compliance statement must:
(The section of this report that fulfils each requirement is given in brackets after it)

1. be applicable to the preferred site and proposed development footprint;

2. confirm that the site is of “low” or “medium” sensitivity for agriculture (Section 7); and
3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (Section 9.9).

It must contain, as a minimum, the following information:

1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vita (CV) (Appendix 2);
2. a signed statement of independence by the specialist (Appendix 3);
3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (Figure 2);
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 (Section 9.8);
5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol (Section 9.8);
6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (Section 9.6);
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 (Section 9.8);
8. any conditions to which this statement is subjected (Section 11);
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 (Section 9.7);
10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 10); and
11. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing soils and agricultural potential

This report adheres to the process and content requirements of the gazetted agricultural protocol as outlined in Section 3 above. As per the requirement, the assessment was based on a desktop

analysis of existing soil and agricultural potential data for the site.

The following sources of information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- Field crop boundaries were sourced from the national web-based environmental screening tool.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Satellite imagery of the site and surrounds was sourced from Google Earth.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

The study makes the assumption that water for irrigation is very limited in the study area. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist. Only very minimal irrigation water has been exploited.

There are no other specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long term lease associated with the renewable energy facility be approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD).

Power lines require the registration of a servitude for each farm portion crossed. In terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA, the registration of a power line servitude requires written consent of the Minister if the following two conditions apply:

1. if the servitude width exceeds 15 metres; and
2. if Eskom is not the applicant for the servitude.

If one or both of these conditions do not apply, then no agricultural consent is required. Eskom is currently exempt from agricultural consent for power line servitudes.

The SALA consent is separate from the application for Environmental Authorisation that is currently underway in terms of Basic Assessments (BAs), and needs to be applied for and obtained separately.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). No application is required in terms of CARA. The BA process covers the required aspects of this.

7 SITE SENSITIVITY VERIFICATION

In terms of the gazetted agricultural protocol (GN 320), a site sensitivity verification must be submitted that:

1. 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.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability.

The screening tool classifies agricultural sensitivity according to two criteria - the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the screening tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-

arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017 DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. This land capability data is used by the screening tool.

The proposed site is identified by the screening tool as being of predominantly low sensitivity for agricultural resources, but it also includes patches of medium sensitivity. A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 2 and 3 below.

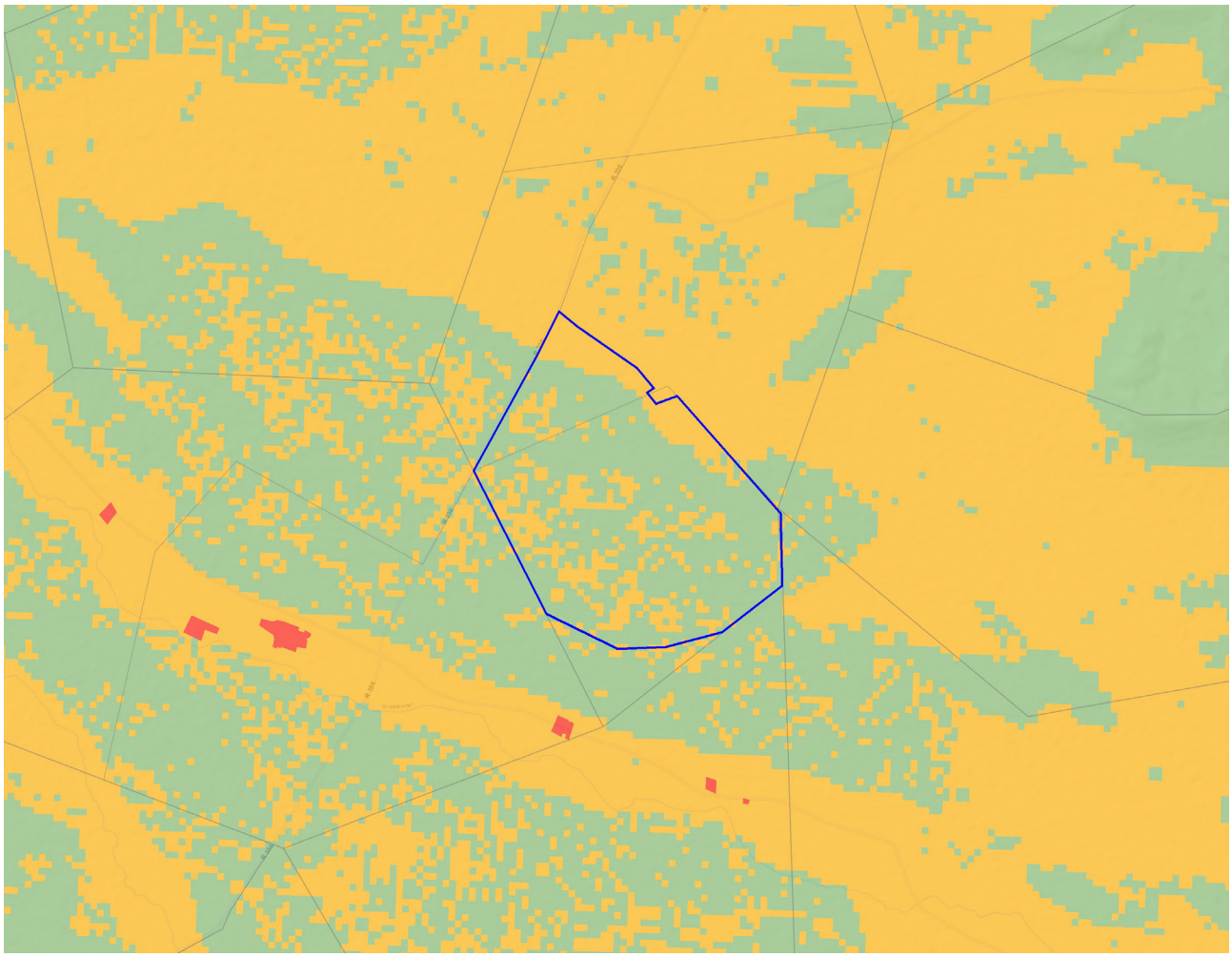

Figure 2. The PV project study area (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

The agricultural capability of all land in the study area is severely constrained by the aridity of the climate. The further basis for the agricultural sensitivity classification of land within the site is summarised in Table 1.

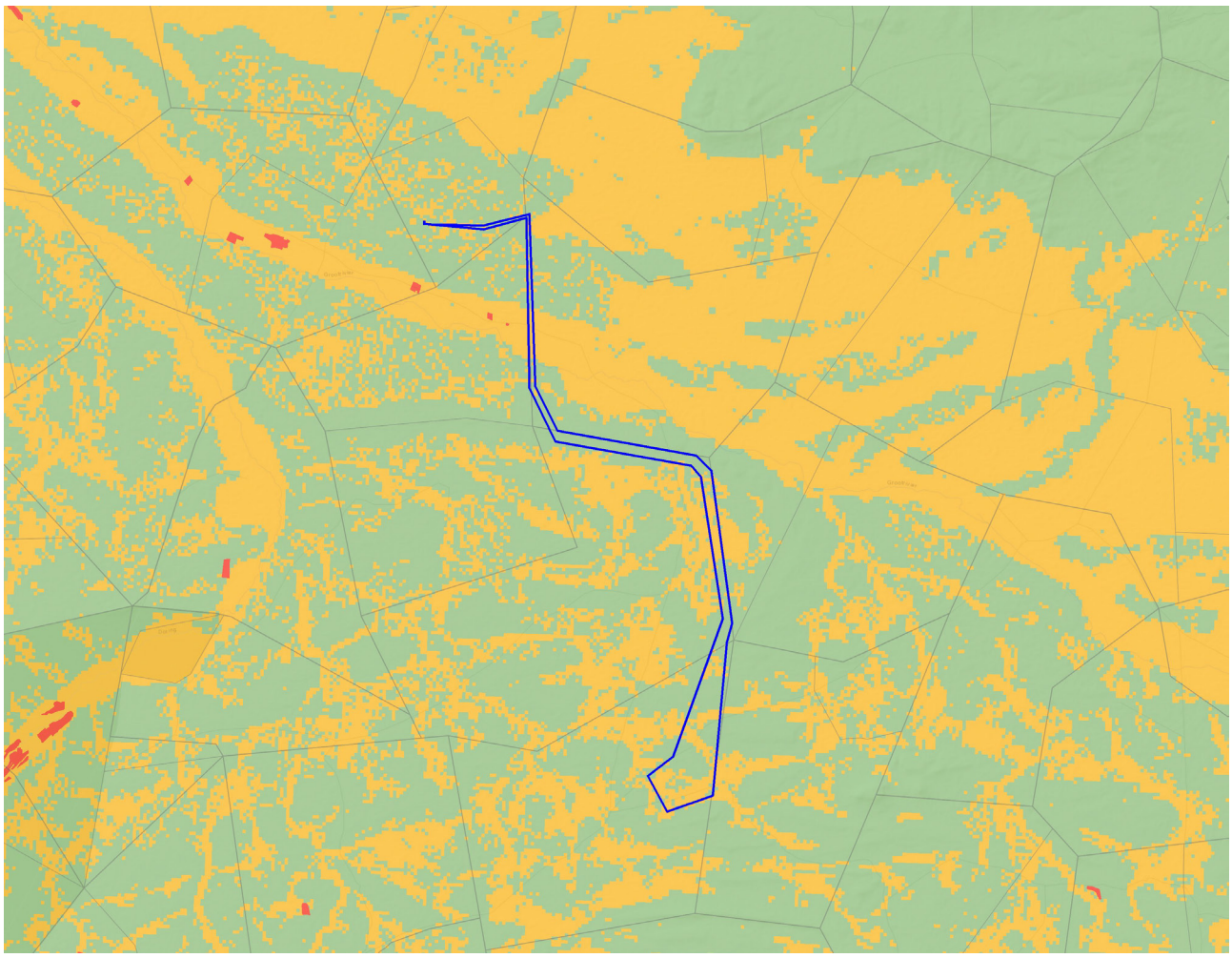

Figure 3. The electrical grid infrastructure corridor (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

Table 1: Description of different agricultural sensitivity classes that occur in the study area.

Sensitivity category	**Cultivation status**	**Land capability evaluation values**	**General description**
Low	Uncultivated	2 to 5	Constrained by aridity. Also constrained by shallow, rocky soils on underlying hard or weathering rock.
Medium	Uncultivated	6 to 7	Constrained by aridity. Less rocky alluvial soils along drainage lines.

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment. The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall of approximately 200 mm per annum and high evaporation of approximately 1,500 mm per annum) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be shallow, rocky soils, with limited pedological development on hard

or weathering underlying rock. The land of the study area, therefore, without doubt, corresponds to the definitions of the different screening tool sensitivity categories in terms of its land capability and cultivation status.

8 AGRICULTURAL LAND USE

The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 General

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or potential future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or potential future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base pose a threat to production and therefore are within the scope of an agricultural impact assessment. Lifestyle impacts on the resident farming community, for example visual impacts, do not necessarily impact agricultural production and, if they do not, are not relevant to and within the scope of an agricultural impact assessment.

For agricultural impacts, the exact nature of the different infrastructure within a facility has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a PV panel or a substation makes no difference. What is of most relevance therefore is simply the total footprint of the facility.

The components of the project that can impact on agriculture are:

1. Occupation of the land by the total, direct, physical footprint of the proposed project including all its infrastructure.
2. Construction activities that may disturb the soil profile and vegetation, for example for levelling, excavations, etc.

The significance of all potential agricultural impacts is kept low by the fact that the proposed site is on land of extremely limited agricultural potential that is only viable for low density grazing.

Electrical grid infrastructure has negligible agricultural impact in this study area for two reasons:

1. Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines.
2. The direct, permanent, physical footprint of the electricity grid infrastructure that has any potential to interfere with agriculture is restricted to pylon bases and substation footprints that, in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

9.2 Direct impacts for Grootfontein 1, 2 & 3 and their associated electrical grid infrastructure

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to the Grootfontein 1, 2 & 3 PV Facilities, and all their electrical grid and other associated infrastructure:

1. **Loss of agricultural land use** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
2. **Soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

9.3 Cumulative impacts of Grootfontein 1, 2 & 3 and their associated electrical grid infrastructure

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

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

> What level of loss of agricultural land use and associated loss of agricultural production is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

DEFF requires compliance with a specified methodology for the assessment of cumulative impacts. This is positive in that it ensures engagement with the important issue of cumulative impacts. However, the required compliance has some limitations and can, in the opinion of the author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

DEFF compliance for this project requires considering all renewable energy projects within a 30 km radius that have received an EA at the time of starting this BA (i.e. by August 2020). It is assumed that each renewable energy project consists of an EGI component. There are eleven other renewable energy project applications within 30km of the proposed site. These are listed in Appendix 1 of this report. In addition, there are nine separate PV projects (with a total of nine power lines, substations and BESS's) associated with the current development and these have also been included in the consideration of cumulative impact in this report.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the nine developments plus the other eleven renewable energy developments (total generation capacity of 4,003 MW) will amount to a total of approximately 5,097 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 1.80% of the surface area. That is within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

Because of the negligible agricultural impacts of electrical grid infrastructure, the agricultural environment can accommodate far more electricity grid infrastructure than currently exists, or is currently proposed, before acceptable levels of change are exceeded.

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

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

9.4 Comparative assessment of alternatives

Due to the low agricultural sensitivity of the site, and the effectively uniform agricultural conditions across the site, it is highly likely that there will be no material difference between the agricultural impact of any possible, alternative layouts on the site.

9.5 Impacts of the no-go alternative

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential such impact is that due to continued low rainfall in the area, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability.

Although the development offers an alternative income source to agriculture, it does exclude agriculture from the impacted land. Therefore, the agricultural impact of the no-go alternative, which does not exclude agriculture, is less significant than the agricultural impact of the development, and so, purely from an agricultural impact perspective, the no-go is the preferred alternative between the development and the no-go. But the development offers a land use with much higher income generating capacity than any viable agricultural land use on the site.

9.6 Micro-siting to minimize fragmentation and disturbance of agricultural activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. It is therefore unnecessary to check whether siting of infrastructure, and any layout of infrastructure within the assessed area is acceptable in terms of agricultural impact.

9.7 Confirmation of linear activity impact

The electrical grid infrastructure is a linear activity. The protocol states that if the activity is a linear one, in which, 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, then the level of agricultural assessment required by the protocol is an Agricultural Compliance Statement. However, in this case, the agricultural sensitivity of the site is less than high, and therefore, regardless of whether the activity is linear or not, only an Agricultural Compliance Statement is required. Confirmation of the linear activity impact is therefore not required in this case.

9.8 Impact footprint

The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy 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 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.

It is hereby confirmed that the final layout, and associated agricultural footprint, will be well within the allowable limit of 2.5 ha per MW (175 MW x 2.5 = 437.5 ha), as per the DEFF protocols. The final agricultural footprint of each project will be in the order of 260 hectares.

9.9 Impact statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development (3 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

The environmental management programme inputs for the protection of soil resources are presented in the tables below for each phase of the development.

Table 2: Management plan for the planning and design phase

Impact	**Mitigation / management objectives and outcomes**	**Mitigation / management actions**	**Monitoring**		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and	Design an effective system	Ensure that the storm water	Once-off during the design	Holder of the EA

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
	existence of hard surfaces causes no erosion on or downstream of the site.	of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	run-off control is included in the engineering design.	phase.	

Table 3: Management plan for the construction phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water	Every 2 months during the construction phase	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the construction phase	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	Check that topsoil covers the entire disturbed area.		

Table 4: Management plan for the operational phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That existence of hard surfaces causes no erosion on or downstream of the site.	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective	Bi-annually	Facility Environmental Manager

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
			action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 5: Management plan for the decommissioning phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation,	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		the stockpiled topsoil must be evenly spread over the entire disturbed surface.			

11 CONCLUSIONS

The site has very low agricultural potential because of, predominantly, aridity constraints, but also due to soil constraints. It is generally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The majority of land within the development area is of low agricultural sensitivity, but it includes areas of medium sensitivity.

Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.

The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.

The conclusion of this assessment is that the proposed development (3 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.

From an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

12 REFERENCES

Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

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DEA, 2015. Strategic Environmental Assessment for wind and solar photovoltaic development in South Africa. CSIR Report Number CSIR: CSIR/CAS/EMS/ER/2015/001/B. Stellenbosch.

Schulze, R.E. 2009. SA Atlas of Climatology and Agrohydrology, available on Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

APPENDIX 1: PROJECTS INCLUDED IN CUMULATIVE ASSESSMENT

The table below shows the renewable energy facilities only, as the associated power line projects within the 30 km radius have a negligible impact from an agricultural perspective.

DEA Reference	Title	Technology	MegaWatts
14/12/16/3/3/1/1976	Kudusberg WEF	Wind	325
12/12/20/1783/1	Perdekraal 1	Wind	150
12/12/20/1783/2	Perdekraal 2	Wind	150
12/12/20/1787[1]	Konstabel	Wind	85
12/12/20/1787	Konstabel	Solar PV	85
12/12/20/1956	Touwsrivier	Solar PV	36
12/12/20/1988	Roggeveld Wind Farm	Wind	750
14/12/16/3/3/2/899	Rietkloof	Wind	36
14/12/16/3/3/2/810	Montague Road	Solar PV	75
14/12/16/3/3/2/900	Brandvalley WEF	Wind	147
14/12/16/3/3/1/1984	Tooverberg WEF	Wind	264
14/12/16/3/3/2/1115	Rondekop WEF	Wind	325
Sub-Total (Authorised Projects)			**2428**
Pending	Proposed Ceres PV Development (9 PV Facilities)	Solar PV	**1575**
Sub-Total (Current Projects)			**1575**
Total (Authorised and Current Projects)			**4003**

[1] The National REEA states that the project is 170 MW and consists of Wind and Solar technology. For purposes of this cumulative assessment for agricultural impacts, it has been assumed that 85 MW is assigned to Solar and 85 MW to Wind.

APPENDIX 2: SPECIALIST CURRICULUM VITAE

Johann Lanz
Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting **Self employed** **2002 - present**

In the past 5 years of running my soil and agricultural consulting business, I have completed more than 120 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, urban, and agricultural developments. My regular clients include: Aurecon; CSIR; SiVEST; Arcus; SRK; Environamics; Royal Haskoning DHV; Jeffares & Green; JG Afrika; Juwi; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant **Agricultural Consultors International (Tinie du Preez)** **1998 - 2001**

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist **De Beers Namaqualand Mines** **July 1997 - Jan 1998**

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine.*

I am a reviewing scientist for the *South African Journal of Plant and Soil*.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPENDIX 3: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

THE PROPOSED GROOTFONTEIN 1, 2 AND 3 SOLAR PV FACILITIES AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
- All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001
Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Johann Lanz – Soil Scientist			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Johann Lanz			
Specialist Qualifications:	M.Sc. (Environmental Geochemistry)			
Professional affiliation/registration:	Registered Professional Natural Scientist Member of the Soil Science Society of South Africa			
Physical address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal code:	7800	Cell:	082 927 9018	
Telephone:	082 927 9018	Fax:	Who still uses a fax? I don't	
E-mail:	johann@johannlanz.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, declare that -

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company:

29/09/2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company

29/09/2020

Date

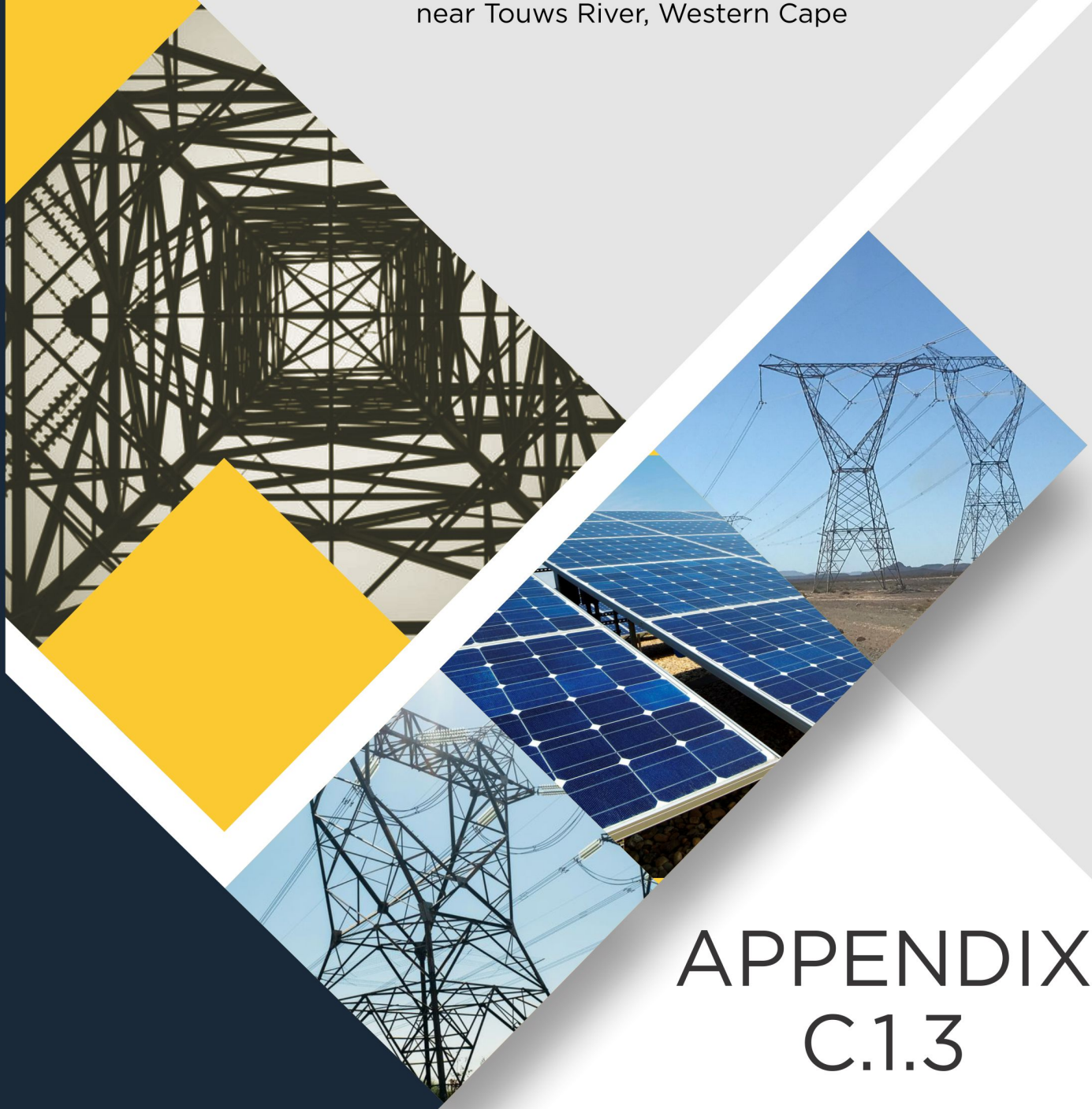
Signature of the Commissioner of Oaths

2020·09·29

Date

SUID-AFRIKAANSE POLISIEDIENS
STATION COMMANDER
29 SEP 2020
SOUTH AFRICAN POLICE SERVICE

Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape



APPENDIX C.1.3

Agriculture Compliance Statement for Hoek Doornen

Johann Lanz
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Reg. no. 400268/12

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SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR
THE PROPOSED HOEK DOORNEN 1, 2, 3 AND 4 SOLAR PV FACILITIES
AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE
NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Report by
Johann Lanz

29 September 2020

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EXECUTIVE SUMMARY

The key findings of this study are:

- The aridity of the area is a significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible across the site.
- Soils include a high proportion of shallow, rocky soils on underlying rock.
- As a result of these limitations, the study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The majority of land within the development area is classified as low agricultural sensitivity, but includes smaller patches of medium sensitivity.
- Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.
- The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.
- The conclusion of this assessment is that the proposed development (4 x 175MW solar photovoltaic (PV) plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.
- From an agricultural impact point of view, it is recommended that the proposed development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the proposed Hoek Doornen 1, 2, 3 and 4 solar photovoltaic (PV) facilities and their associated electrical grid infrastructure, approximately 35 km north-north-west of Touws River, Western Cape Province (see Figure 1). This report provides all of the inputs required by the *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*, gazetted on 20 March 2020 in Government Notice (GN) 320 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA), 1998). Johann Lanz was appointed as an independent agricultural specialist to provide these inputs.

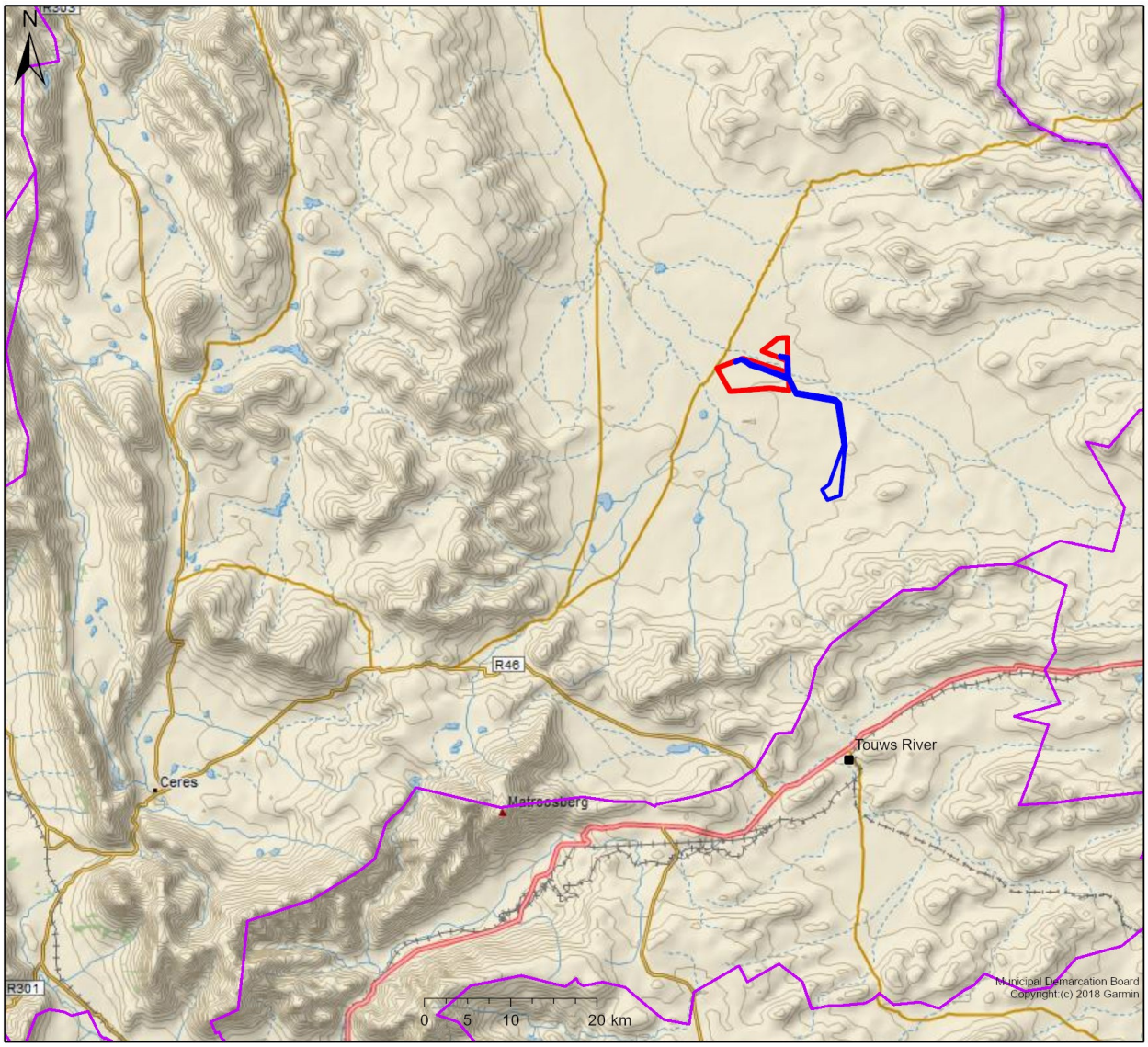

Figure 1. Locality map of the site, with the Hoek Doornen PV project study area in red and electrical grid infrastructure corridor in blue.

2 PROJECT DESCRIPTION

The proposed four PV developments will each have a capacity of 175MW. They will consist of the standard infrastructure of a PV facility including, but not limited to, PV arrays (which may require clearing of all vegetation under panels); onsite substation; 132 kV overhead power line to the Eskom Kappa substation; a battery energy storage system (BESS); offices; operation and maintenance (O&M) building; construction laydown area; access roads; panel maintenance and cleaning area, and security fencing and lighting. One of the farm access roads running through the Hoek Doornen 4 site will also be re-routed south of the PV area.

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land and whether it is being occupied by a solar panel, a road, a building or a substation makes no difference. What is of most relevance and addressed in this assessment, therefore, is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land.

The proposed development falls entirely within Renewable Energy Development Zone (REDZ) 2, namely the Komsberg REDZ.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *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*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The proposed site is identified by the national web-based environmental screening tool (hereafter referred to as “Screening Tool”) as being of low and medium sensitivity for agricultural resources, and the protocol therefore requires that the level of agricultural assessment be an Agricultural Compliance Statement. The protocol also requires that a Site Sensitivity Verification be done.

The protocol states that an Agricultural Compliance Statement must be prepared by a competent soil scientist/agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP).

The compliance statement must:
(The section of this report that fulfils each requirement is given in brackets after it)

1. be applicable to the preferred site and proposed development footprint;
2. confirm that the site is of “low” or “medium” sensitivity for agriculture (Section 7); and
3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (Section 9.9).

It must contain, as a minimum, the following information:

1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vita (CV) (Appendix 2);
2. a signed statement of independence by the specialist (Appendix 3);
3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (Figure 2);
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 (Section 9.8);
5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol (Section 9.8);
6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (Section 9.6);
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 (Section 9.8);
8. any conditions to which this statement is subjected (Section 11);
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 (Section 9.7);
10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 10); and
11. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing soils and agricultural potential

This report adheres to the process and content requirements of the gazetted agricultural protocol as outlined in Section 3 above. As per the requirement, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site.

The following sources of information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- Field crop boundaries were sourced from the national web-based environmental screening tool.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Satellite imagery of the site and surrounds was sourced from Google Earth.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

The study makes the assumption that water for irrigation is very limited in the study area. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist. Only very minimal irrigation water has been exploited.

There are no other specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long term lease

associated with the renewable energy facility be approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD).

Power lines require the registration of a servitude for each farm portion crossed. In terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA, the registration of a power line servitude requires written consent of the Minister if the following two conditions apply:

1. if the servitude width exceeds 15 metres; and
2. if Eskom is not the applicant for the servitude.

If one or both of these conditions do not apply, then no agricultural consent is required. Eskom is currently exempt from agricultural consent for power line servitudes.

The SALA consent is separate from the application for Environmental Authorisation that is currently underway in terms of Basic Assessments (BAs), and needs to be applied for and obtained separately.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). No application is required in terms of CARA. The BA process covers the required aspects of this.

7 SITE SENSITIVITY VERIFICATION

In terms of the gazetted agricultural protocol (GN 320), a site sensitivity verification must be submitted that:

1. 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.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability.

The screening tool classifies agricultural sensitivity according to two criteria - the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is

required for food security.

Uncultivated land is classified by the screening tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017 DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. This land capability data is used by the screening tool.

The proposed site is identified by the screening tool as being of predominantly low sensitivity for agricultural resources, but it also includes patches of medium sensitivity. A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 2 and 3 below.

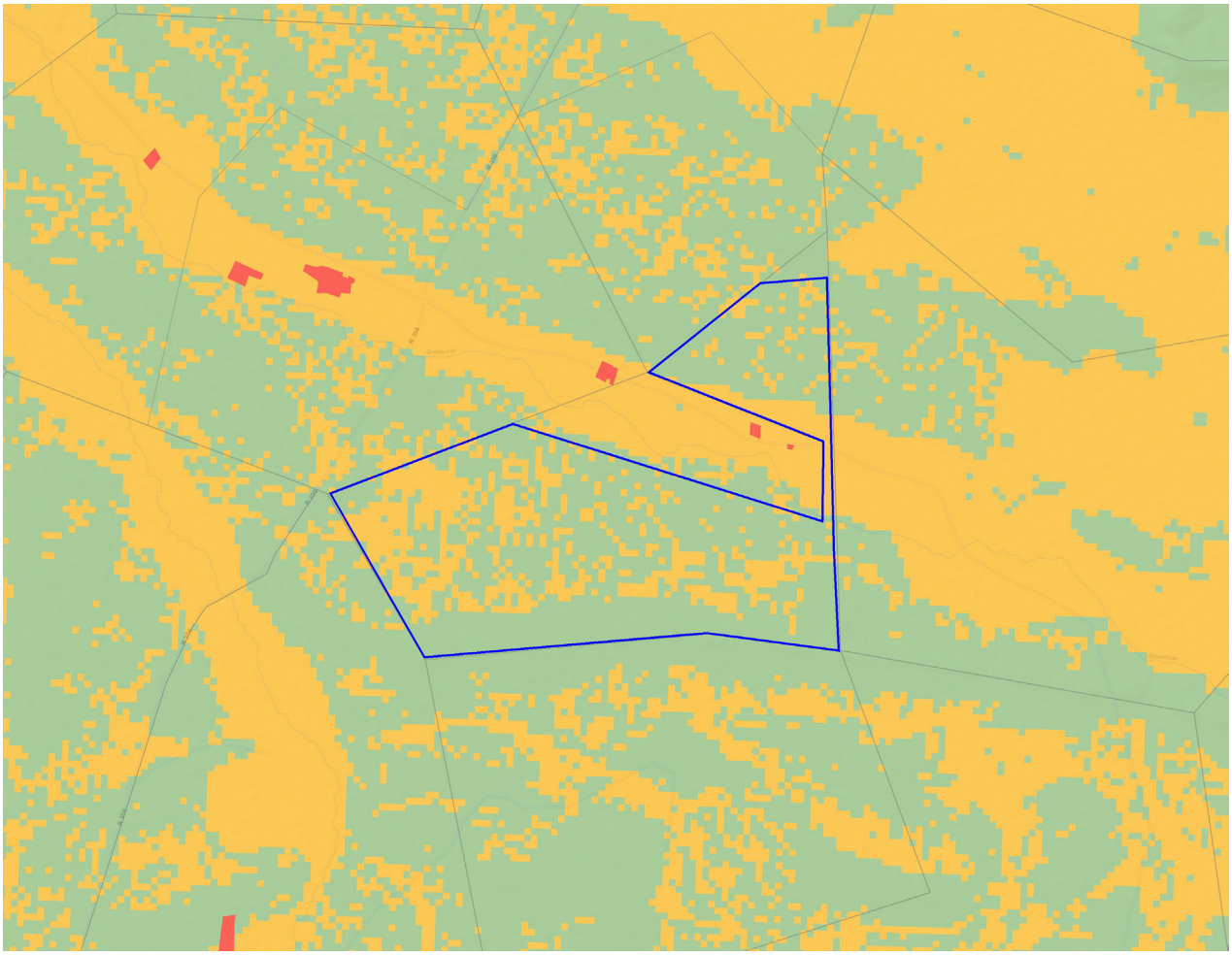

Figure 2. The PV project study area (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

The agricultural capability of all land in the study area is severely constrained by the aridity of the climate. The further basis for the agricultural sensitivity classification of land within the site is summarised in Table 1.

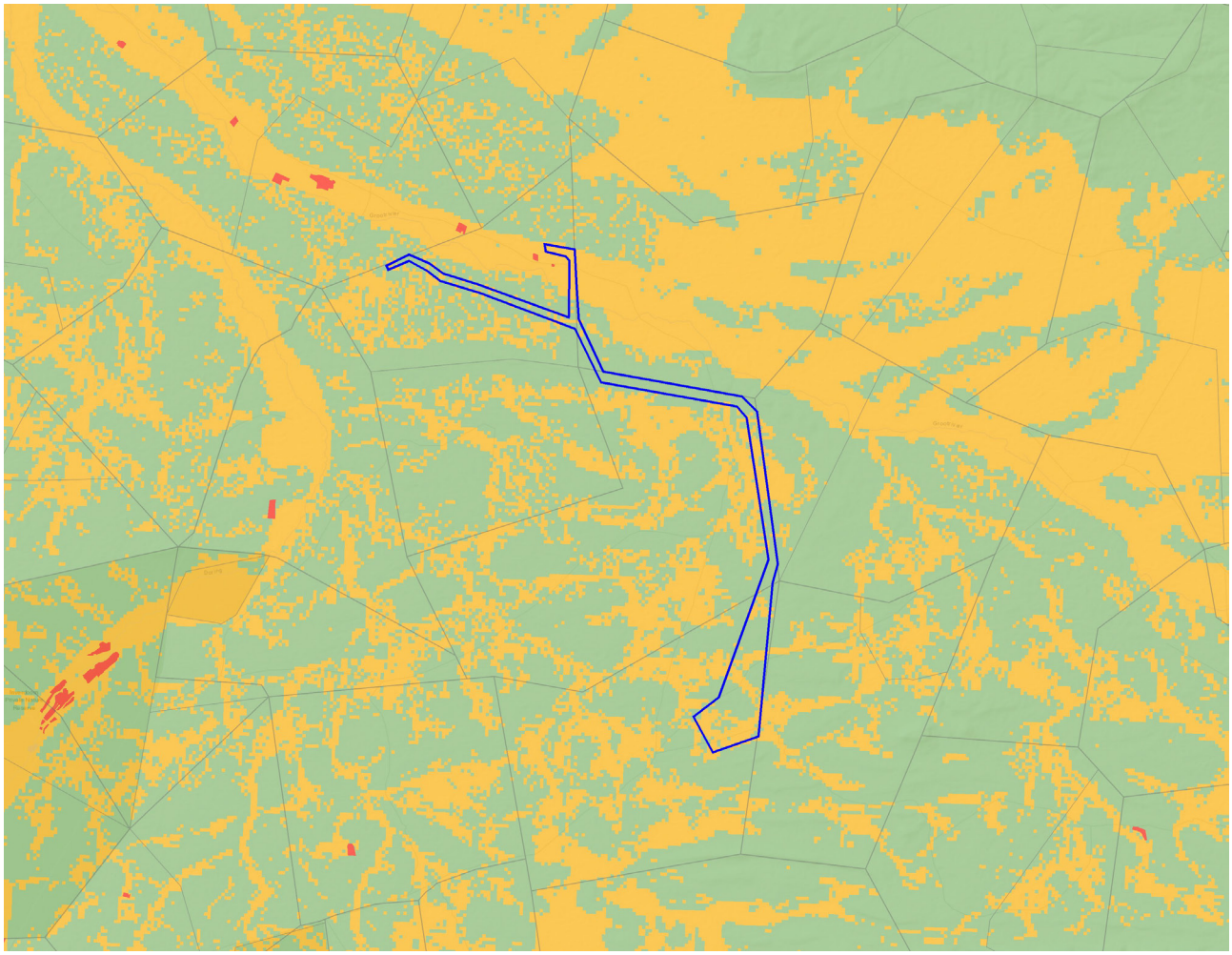

Figure 3. The electrical grid infrastructure corridor (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

Table 1: Description of different agricultural sensitivity classes that occur in the study area.

Sensitivity category	**Cultivation status**	**Land capability evaluation values**	**General description**
Low	Uncultivated	2 to 5	Constrained by aridity. Also constrained by shallow, rocky soils on underlying hard or weathering rock.
Medium	Uncultivated	6 to 7	Constrained by aridity. Less rocky alluvial soils along drainage lines.

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment. The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall of approximately 200 mm per annum and high evaporation of approximately 1,500 mm per annum) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be shallow, rocky soils, with limited pedological development on hard or weathering underlying rock. The land of the study area, therefore, without doubt, corresponds to the definitions of the different screening tool sensitivity categories in terms of its land capability and cultivation status.

8 AGRICULTURAL LAND USE

The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 General

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or potential future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or potential future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base pose a threat to production and therefore are within the scope of an agricultural impact assessment. Lifestyle impacts on the resident farming community, for example visual impacts, do not necessarily impact agricultural production and, if they do not, are not relevant to and within the scope of an agricultural impact assessment.

For agricultural impacts, the exact nature of the different infrastructure within a facility has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a PV panel or a substation makes no difference. What is of most relevance therefore is simply the total footprint of the facility.

The components of the project that can impact on agriculture are:

1. Occupation of the land by the total, direct, physical footprint of the proposed project including all its infrastructure.
2. Construction activities that may disturb the soil profile and vegetation, for example for

levelling, excavations, etc.

The significance of all potential agricultural impacts is kept low by the fact that the proposed site is on land of extremely limited agricultural potential that is only viable for low density grazing.

Electrical grid infrastructure has negligible agricultural impact in this study area for two reasons:

1. Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines.
2. The direct, permanent, physical footprint of the electricity grid infrastructure that has any potential to interfere with agriculture is restricted to pylon bases and substation footprints that, in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

9.2 Direct impacts for Hoek Doornen 1, 2, 3 and 4 and their associated electrical grid infrastructure

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to the Hoek Doornen 1, 2, 3 and 4 PV Facilities, and all their electrical grid and other associated infrastructure:

1. **Loss of agricultural land use** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
2. **Soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

9.3 Cumulative impacts of Hoek Doornen 1, 2, 3 and 4 and their associated electrical grid infrastructure

The cumulative impact of a development is the impact that development will have when its impact

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

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

> What level of loss of agricultural land use and associated loss of agricultural production is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

DEFF requires compliance with a specified methodology for the assessment of cumulative impacts. This is positive in that it ensures engagement with the important issue of cumulative impacts. However, the required compliance has some limitations and can, in the opinion of the author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

DEFF compliance for this project requires considering all renewable energy projects within a 30 km radius that have received an EA at the time of starting this BA (i.e. by August 2020). It is assumed that each renewable energy project consists of an EGI component. There are eleven other renewable energy project applications within 30km of the proposed site. These are listed in Appendix 1 of this report. In addition, there are nine separate PV projects (with a total of nine power lines, substations and BESS's) associated with the current development and these have also been included in the consideration of cumulative impact in this report.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the nine developments plus the other eleven renewable energy developments (total generation capacity of

4,003 MW) will amount to a total of approximately 5,097 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 1.80% of the surface area. That is within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

Because of the negligible agricultural impacts of electrical grid infrastructure, the agricultural environment can accommodate far more electricity grid infrastructure than currently exists, or is currently proposed, before acceptable levels of change are exceeded.

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

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

9.4 Comparative assessment of alternatives

Due to the low agricultural sensitivity of the site, and the effectively uniform agricultural conditions across the site, it is highly likely that there will be no material difference between the agricultural impact of any possible, alternative layouts on the site.

9.5 Impacts of the no-go alternative

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential such impact is that due to continued low rainfall in the area, which is likely to be exacerbated by climate change, agriculture

in the area will come under increased pressure in terms of economic viability.

Although the development offers an alternative income source to agriculture, it does exclude agriculture from the impacted land. Therefore, the agricultural impact of the no-go alternative, which does not exclude agriculture, is less significant than the agricultural impact of the development, and so, purely from an agricultural impact perspective, the no-go is the preferred alternative between the development and the no-go. But the development offers a land use with much higher income generating capacity than any viable agricultural land use on the site.

9.6 Micro-siting to minimize fragmentation and disturbance of agricultural activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. It is therefore unnecessary to check whether siting of infrastructure, and any layout of infrastructure within the assessed area is acceptable in terms of agricultural impact.

9.7 Confirmation of linear activity impact

The electrical grid infrastructure is a linear activity. The protocol states that if the activity is a linear one, in which, 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, then the level of agricultural assessment required by the protocol is an Agricultural Compliance Statement. However, in this case, the agricultural sensitivity of the site is less than high, and therefore, regardless of whether the activity is linear or not, only an Agricultural Compliance Statement is required. Confirmation of the linear activity impact is therefore not required in this case.

9.8 Impact footprint

The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy 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 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.

It is hereby confirmed that the final layout, and associated agricultural footprint, will be well within the allowable limit of 2.5 ha per MW (175 MW x 2.5 = 437.5 ha), as per the DEFF protocols. The final agricultural footprint of each project will be in the order of 260 hectares.

9.9 Impact statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development (4 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

The environmental management programme inputs for the protection of soil resources are presented in the tables below for each phase of the development.

Table 2: Management plan for the planning and design phase

Impact	**Mitigation / management objectives and outcomes**	**Mitigation / management actions**	**Monitoring**		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Design an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	Ensure that the storm water run-off control is included in the engineering design.	Once-off during the design phase.	Holder of the EA

Table 3: Management plan for the construction phase

Impact	**Mitigation / management objectives and outcomes**	**Mitigation / management actions**	**Monitoring**		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of	Implement an effective system of storm water	Undertake a periodic site inspection to	Every 2 months during the construction	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
	hard surfaces causes no erosion on or downstream of the site.	run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	phase	
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the construction phase	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available	Record GPS positions of all occurrences of below-surface soil disturbance (e.g.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.		

Table 4: Management plan for the operational phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That existence of hard surfaces causes no erosion on or downstream of the site.	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the	Bi-annually	Facility Environmental Manager

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
			occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
Erosion	That denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 5: Management plan for the decommissioning phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	sign-off is achieved.	
Erosion	That vegetation clearing does not pose a high erosion risk.	Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 4 months during the decommissionin g phase, and then every 6 months after completion of decommissionin g, until final sign-off is achieved.	Environmental Control Officer (ECO)
Topsoil loss	That topsoil loss is minimised	If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	topsoil covers the entire disturbed area.		

11 CONCLUSIONS

The site has very low agricultural potential because of, predominantly, aridity constraints, but also due to soil constraints. It is generally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The majority of land within the development area is of low agricultural sensitivity, but it includes areas of medium sensitivity.

Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but neither is of high significance.

The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.

The conclusion of this assessment is that the proposed development (4 x 175MW Solar PV plus associated electrical grid infrastructure) will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the amount of agricultural land loss is within the allowable development limits, and that the proposed development poses a low risk in terms of causing soil degradation.

From an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the

recommendation for its approval is not subject to any conditions.

12 REFERENCES

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APPENDIX 1: PROJECTS INCLUDED IN CUMULATIVE ASSESSMENT

The table below shows the renewable energy facilities only, as the associated power line projects within the 30 km radius have a negligible impact from an agricultural perspective.

DEA Reference	Title	Technology	MegaWatts
14/12/16/3/3/1/1976	Kudusberg WEF	Wind	325
12/12/20/1783/1	Perdekraal 1	Wind	150
12/12/20/1783/2	Perdekraal 2	Wind	150
12/12/20/1787[1]	Konstabel	Wind	85
12/12/20/1787	Konstabel	Solar PV	85
12/12/20/1956	Touwsrivier	Solar PV	36
12/12/20/1988	Roggeveld Wind Farm	Wind	750
14/12/16/3/3/2/899	Rietkloof	Wind	36
14/12/16/3/3/2/810	Montague Road	Solar PV	75
14/12/16/3/3/2/900	Brandvalley WEF	Wind	147
14/12/16/3/3/1/1984	Tooverberg WEF	Wind	264
14/12/16/3/3/2/1115	Rondekop WEF	Wind	325
Sub-Total (Authorised Projects)			**2428**
Pending	Proposed Ceres PV Development (9 PV Facilities)	Solar PV	**1575**
Sub-Total (Current Projects)			**1575**
Total (Authorised and Current Projects)			**4003**

[1] The National REEA states that the project is 170 MW and consists of Wind and Solar technology. For purposes of this cumulative assessment for agricultural impacts, it has been assumed that 85 MW is assigned to Solar and 85 MW to Wind.

APPENDIX 2: SPECIALIST CURRICULUM VITAE

Johann Lanz
Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting **Self employed** **2002 - present**

In the past 5 years of running my soil and agricultural consulting business, I have completed more than 120 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, urban, and agricultural developments. My regular clients include: Aurecon; CSIR; SiVEST; Arcus; SRK; Environamics; Royal Haskoning DHV; Jeffares & Green; JG Afrika; Juwi; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant **Agricultural Consultors International (Tinie du Preez)** **1998 - 2001**

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist **De Beers Namaqualand Mines** **July 1997 - Jan 1998**

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine.*

I am a reviewing scientist for the *South African Journal of Plant and Soil*.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPENDIX 3: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

THE PROPOSED HOEK DOORNEN 1, 2, 3 AND 4 SOLAR PV FACILITIES AND THEIR ASSOCIATED ELECTRICAL GRID INFRASTRUCTURE NEAR TOUWS RIVER, WESTERN CAPE PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
- All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001
Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Johann Lanz – Soil Scientist			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Johann Lanz			
Specialist Qualifications:	M.Sc. (Environmental Geochemistry)			
Professional affiliation/registration:	Registered Professional Natural Scientist Member of the Soil Science Society of South Africa			
Physical address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal address:	1a Wolfe Street, Wynberg, Cape Town, 7800			
Postal code:	7800	Cell:	082 927 9018	
Telephone:	082 927 9018	Fax:	Who still uses a fax? I don't	
E-mail:	johann@johannlanz.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, declare that -

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company:

29/09/2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Johann Lanz - Soil Scientist (sole proprietor)

Name of Company

29/09/2020

Date

Signature of the Commissioner of Oaths

2020·09·29

Date

SUID-AFRIKAANSE POLISIEDIENS
STATION COMMANDER
29 SEP 2020
SOUTH AFRICAN POLICE SERVICE