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AGRICULTURAL AGRO-ECOSYSTEM SPECIALIST ASSESSMENT
AND
SITE SENSITIVITY VERIFICATION
FOR
CONSTRUCTION AND OPERATION OF A BATTERY ENERGY STORAGE SYSTEM (BESS)
AND ASSOCIATED INFRASTRUCTURE
FOR THE AUTHORISED WAAIHOEK WIND FARM
LOCATED SOUTH-EAST OF UTRECHT, IN KWA-ZULU NATAL

Report by
Johann Lanz

1 November 2020

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EXECUTIVE SUMMARY

The key findings of this study are:

- The proposed site is identified by the screening tool as being of predominantly high and very high sensitivity for agricultural resources, as a result of its relatively high land capability values.
- The high land capability is a result of the deep soils and high rainfall.
- However, several other factors limit the agricultural potential of the land: The soils are acidic, nutrient poor soils with a high susceptibility to erosion. Rock outcrops are common and limit cultivation. Probably the greatest limitation is that the land is fairly inaccessible because it is on a plateau surrounded by steep slopes.
- These factors have prevented the land from ever being cultivated and limit its agricultural land use to grazing only.
- Two potential negative agricultural impacts were identified, loss of agricultural land use and land degradation, but both are of low 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 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 land is of limited agricultural potential and that the actual amount of agricultural land loss is small.
- From an agricultural impact point of view, it is recommended that the development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the proposed construction and operation of a BESS and associated infrastructure for the authorised Waaihoek Wind Farm (14/12/16/3/3/2/655 and 14/12/16/3/3/2/654), located south-east of Utrecht, in Kwa-Zulu Natal (see Figure 1). In terms of the National Environmental Management Act (NEMA), an application for environmental authorisation requires an agricultural assessment, in this case an Agricultural Agro-Ecosystem Specialist Assessment (see terms of reference, below).

Johann Lanz was appointed as an independent agricultural specialist to provide the Agricultural Assessment. The objective and focus of an Agricultural Agro-Ecosystem Specialist Assessment is to assess whether or not the proposed development will have an unacceptable agricultural impact or not, and based on this, to make a recommendation on whether it should be approved or not.

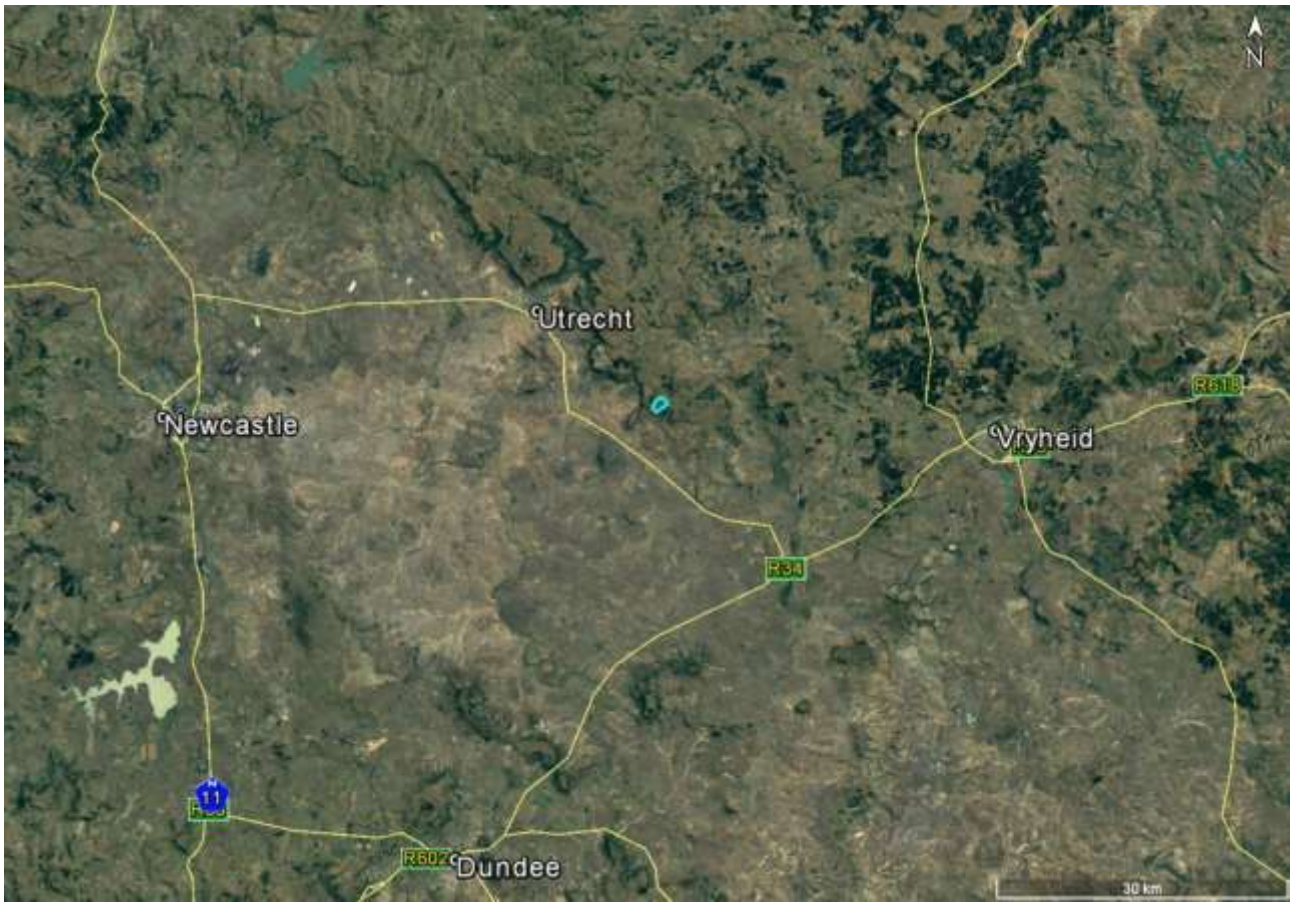

Figure 1. *Location map showing showing the site, outlined in blue, south-east of the town of Utrecht.*

2 PROJECT DESCRIPTION

The project comprises the following two components:

1. Waaihoek Battery Energy Storage System (BESS) adjacent to the authorised Waaihoek substation.
   The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while wind is blowing, while the peak demand may not necessarily occur during the daytime. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.
   The BESS capacity will up to 200 MWh, and its footprint will be up to 2 hectares.

2. Waaihoek reservoir.
   The Waaihoek reservoir is proposed to be located within the Waaihoek Substation assessment area or within the BESS assessment area (alternatives considered). It will have a capacity of at least 250m^3 and will be used to meet the water demands during construction. Water pipelines will not be installed or required. Water tankers will abstract water from boreholes and transport it to the reservoir. Thereafter, when water is required from the reservoir, the water tankers will abstract via a pump and transport the water to the WEF batching plant.

3 TERMS OF REFERENCE

The terms of reference for this study is to be a specialist report that fulfills the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted on 20 March 2020.

The site includes land that is classified by the national web-based environmental screening tool as high sensitivity for impacts on agricultural resources. The level of agricultural assessment required in terms of the protocol (and in terms of NEMA) is therefore an Agricultural Agro-Ecosystem Specialist Assessment. The terms of reference for such an assessment, as stipulated in the protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets:

1. The assessment must be undertaken by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP).
2. The assessment must be undertaken on the preferred site and within the proposed development footprint.
3. The assessment must be undertaken based on a site inspection as well as an investigation

of the current production figures, where the land is under cultivation or has been within the past 5 years, and must identify:

a) the extent of the impact of the proposed development on the agricultural resources (Section 7.2);

b) whether or not the proposed development will have an unacceptable negative impact on the agricultural production capability of the site (Section 7.5), and in the event where it does, whether such a negative impact is outweighed by the positive impact of the proposed development on agricultural resources.

4. The status quo of the site must be described, including the following aspects which must be considered as a minimum in the baseline description of the agro-ecosystem:

   a) The soil form/s, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit and slope (Sections 6.1 & 6.2);

   b) Where applicable, the vegetation composition, available water sources as well as agro-climatic information (Sections 6.4 & 6.5);

   c) The current productivity of the land based on production figures for all agricultural activities undertaken on the land for the past 5 years, expressed as an annual figure and broken down into production units (Section 6.7);

   d) The current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure (Section 6.8);

   e) Existing impacts on the site, located on a map where relevant (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc.)(Section 6.9).

5. Assessment of Impacts, including the following which must be considered as a minimum in the predicted impact of the proposed development on the agro-ecosystem:

   a) Change in productivity for all agricultural activities based on the figures of the past 5 years, expressed as an annual figure and broken down into production units (Section 7.4.1);

   b) Change in employment figures (both permanent and casual) for the past 5 years expressed as an annual figure (Section 7.4.2);

   c) Any alternative development footprints within the preferred site which would be of “medium” or “low” sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification (Section 7.4.6).

The findings of the Agricultural Agro-Ecosystem Specialist Assessment must be written up in an Agricultural Agro-Ecosystem Specialist Report. This report must contain the findings of the agro-ecossytem specialist assessment and the following information as a minimum:

1. Details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vita

(Appendix 2);

2. A signed statement of independence by the specialist (Appendix 3);
3. The duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (Section 4.1);
4. A description of the methodology used to undertake the on-site assessment inclusive of the equipment and models used, as relevant (Section 4.1);
5. 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 4);
6. An indication of the potential losses in production and employment from the change of the agricultural use of the land as a result of the proposed development (Sections 7.4.1 & 7.4.2);
7. an indication of possible long term benefits that will be generated by the project in comparison to the benefits of the agricultural activities on the affected land (Section 7.4.3);
8. Additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc. (Section 7.4.4);
9. Information on the current agricultural activities being undertaken on adjacent land parcels (Section 6.5);
10. an identification of any areas to be avoided, including any buffers (Section 7.4.5);
11. a motivation must be provided if there were development footprints identified as per point 5c above that were identified as having a medium or low agricultural sensitivity and that were not considered appropriate;
12. Confirmation from the soil scientist or agricultural specialist that all reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities (Section 7.4.7);
13. A substantiated statement from the soil scientist or agricultural specialist with regards to agricultural resources on the acceptability or not of the proposed development and a recommendation on the approval or not of the proposed development (Sections 7.5);
14. Any conditions to which this statement is subjected (Section 9);
15. Where identified, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr) (Section 8);
16. 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 the agro-ecosystem

This assessment was informed by the agricultural and soils assessment report that was completed for the authorised Waaihoek wind farm in 2014. That report included fieldwork and it was deemed unnecessary to repeat the fieldwork for this assessment. This assessment was also informed by existing, published soil and agricultural potential data for the site. The following sources of existing information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries. 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 Department of Agriculture, Forestry and Fisheries, Pretoria.
- 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.

An assessment of soils and long term agricultural potential is in no way affected by the season in which the assessment is made, and therefore the fact that the assessment was done in late summer / autumn has no bearing on its results.

Information on agricultural activities on site was obtained from the farmer, Karel Landman.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

The assessment rating of impacts is not an absolute measure. It is based on the subjective considerations and experience of the specialist, but is done with due regard and as accurately as possible within these constraints.

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

6 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

Photographs of site conditions and soils are shown in Figures 2 and 3.

6.1 Soils

The underlying geology of the site is mainly dolerite with sandstone of the Vryheid Formation of the Ecca Group.

The land type classification is a nationwide survey that groups areas of similar soil, terrain and climatic conditions into different land types. One land type, Ac111 covers the whole plateau on which the site is located. Soils of this land type are predominantly well-drained, deep to moderately deep, red and yellow, loamy soils with apedal (with little structure) upper soil horizons on underlying, partially weathered dolerite. Dominant soil forms are Hutton, Griffin and Clovelly. Some shallower soils on rock and on clay also occur. Rock outcrops occupy 7% of the surface area of the land type. The land type soil data is given in Appendix 1.

Figure 2. *View showing typical site conditions.*

Figure 3. *View of typical site conditions with soils in foreground.*

6.2 Terrain and slope

The site is situated at an altitude of approximately 1,550 metres on a slightly undulating plateau surrounded by steep slopes. The slopes across the site itself are around 5%.

6.3 Available water sources

Although there is water in the valleys below the plateau, the plateau itself has little water and Irrigation is therefore not viable.

6.4 Agro-climatic information

The site has a summer rainfall with an average annual rainfall of 690 mm per annum and an average annual evaporation of 1,350 mm. It has a long term monthly minimum temperature in June of 1.7°C.

6.5 Land use and development on and surrounding the site

The site and surrounds are used only for the grazing of cattle.

6.6 Agricultural potential

The predominantly deep apedal soils and the relatively high rainfall give the site a relatively high land capability. The land capability values vary across the site from 7 (low to moderate) to 11 (high). Land capability values over 8 suggest that land is suitable for the production of cultivated

crops. However, in this case there are a number of other factors which make the land unsuitable for cultivation. The soils are acidic, nutrient poor soils with a high susceptibility to erosion. Rock outcrops are common and limit cultivation. Probably the greatest limitation is that the land is fairly inaccessible because it is on a plateau surrounded by steep slopes.

These factors have prevented the land from ever being cultivated and limit its agricultural land use to grazing only.

6.7 Agricultural productivity

The site has a relatively high grazing capacity of 2.5 hectares per large stock unit, so it is productive grazing land for cattle. Productivity data is however not available for the site.

6.8 Agricultural employment

The cattle farming provides minimal agricultural employment.

6.9 Existing impacts on the site

There is some evidence of erosion in places on the site but it is not particularly bad.

6.10 Site sensitivity verification

In terms of the gazetted agricultural protocol, 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 only two criteria – land capability and whether the land is cultivated or not. 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 high and very high sensitivity for agricultural resources. A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 4, below.

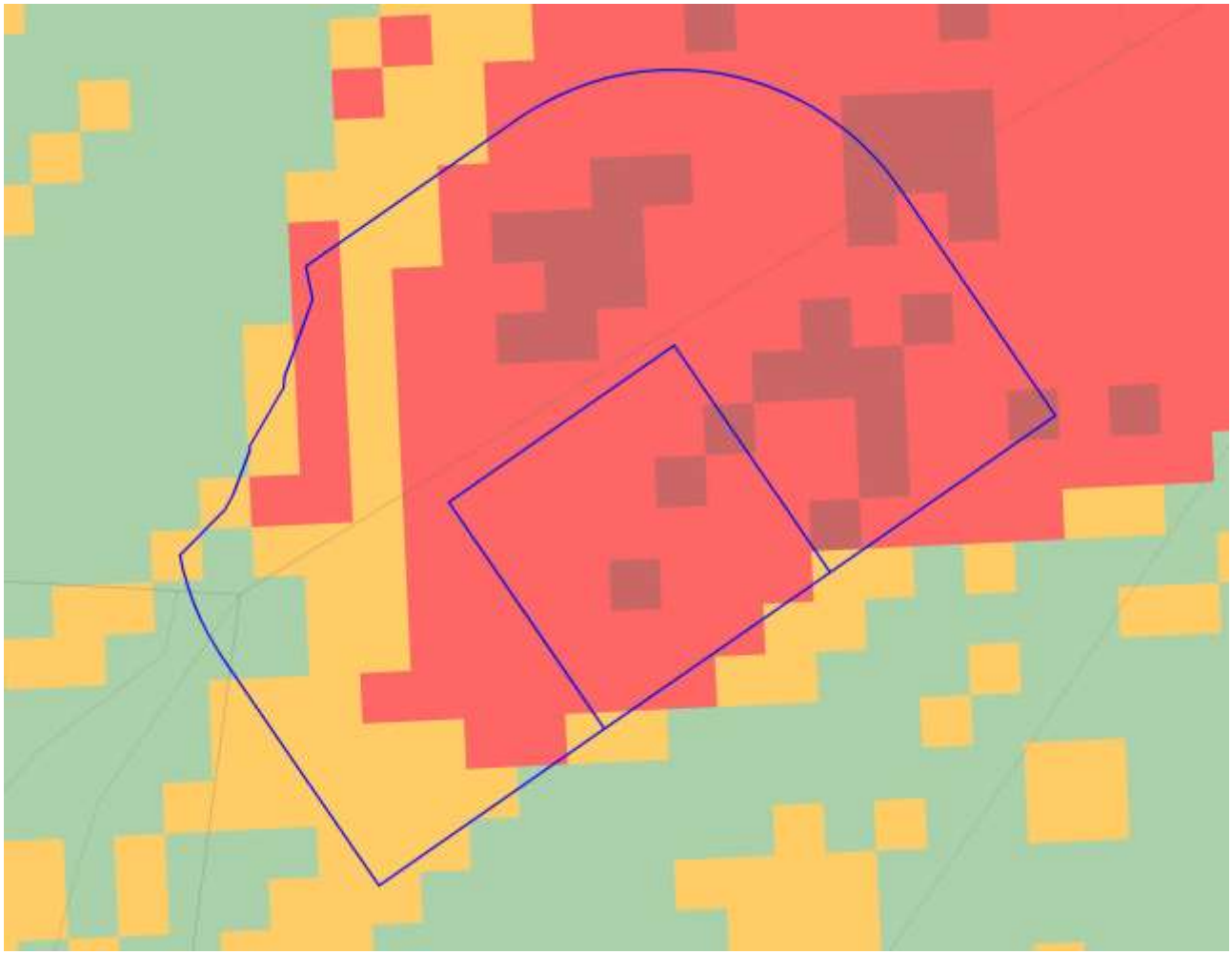

Figure 4. The proposed development site overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).

The high and very high sensitivity is a result of the land capability values for the site. High sensitivity areas have land capabilities of 9 and 10, and very high sensitivity areas have a land capability of 11. However, as is discussed in Section 6.6 above, the high land capability is a result of the deep soils and high rainfall, but despite this, other factors prevent the land from being viable arable land and limit its agricultural land use to grazing only.

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment, but largely because it is practically impossible to dispute land capability, which is based on extensive records and research, and is fairly narrowly defined in terms of soil, climate and terrain. However, while the sensitivity cannot be disputed because it is rigidly defined in terms of land capability, what is of most importance for agricultural impact is that, despite the high sensitivity rating, the land is actually of limited agricultural value. It is not viable arable land and therefore not considered particularly preservation worthy as agricultural production land.

7 IDENTIFICATION AND ASSESSMENT OF IMPACTS ON AGRICULTURE

7.1 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 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 road 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, road access etc.

7.2 Impact identification and assessment

As noted above, the significance of an agricultural impact is a direct function of the degree to which that impact will affect current or potential future agricultural production, and it is on this basis that impacts have been assessed in this report. The significance of all potential agricultural impacts on this site is mitigated by two factors:

- the fact that the proposed site is on land of limited agricultural potential that is only viable for grazing.
- The agricultural footprint of the proposed project is very small in relation to the available grazing land on and surrounding the site.

Two potential agricultural impacts have been identified and are formally assessed in the tables below.

7.2.1 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.

Nature	Negative				
Type	Direct				
Impact	**Effect**			**Likelihood**	**Overall significance**
	Duration	**Extent**	**Severity**		
Without mitigation	Long term	Localised	Moderate	Definite	Low negative
Impact		**Reversibility**	**Irreplaceable loss**	**Mitigation potential**	**Overall significance**
With mitigation		Reversible (during de-commissioning)	Resource will not be lost	Achievable (during de-commissioning)	Low negative

No-go alternative	No impact - Status quo remains

7.2.2 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.

The following mitigation measures are recommended against soil degradation:

- Implement an effective system of storm water run-off control using bunds and ditches, where it is required - that is at all points of disturbance where water accumulation might occur. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.
- Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.
- Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.
- 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, the stockpiled topsoil must be evenly spread over the entire disturbed surface, and then stabilized by facilitating vegetation cover.

Nature	Negative				
Type	Direct				
Impact	**Effect**			**Likelihood**	**Overall**
	Duration	**Extent**	**Severity**		**significance**
Without mitigation	Short term	Localised	Slight	May occur	Low negative
Impact		**Reversibility**	**Irreplaceable loss**	**Mitigation potential**	**Overall significance**
With mitigation		Reversible	Resource will not be lost	Achievable	Low negative

No-go alternative	No impact - Status quo remains

7.3 Cumulative impact

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?

Predominantly because of the low impact of the proposed development, the cumulative agricultural impact of loss of agricultural land use in the area will not be an unacceptable negative agricultural impact. It is therefore recommended, from a cumulative impact perspective, that the development is approved.

7.4 Additional aspects of agricultural impact

Consideration of the following additional aspects of the agricultural impact are required by the

gazetted agricultural protocol.

7.4.1 Change in agricultural production

No significant change in agricultural production is likely to result from the proposed development, because grazing can continue unaffectedly everywhere on the site other than the small agricultural footprint.

7.4.2 Change in agricultural employment

No significant change in agricultural employment is likely to result from the proposed development, because of the small area of affected land.

7.4.3 Development benefits versus agricultural benefits

Because agricultural activities and production can be retained, with very little change, none of the current agricultural benefits will be lost. The development will add the additional environmental, social and economic benefits associated with the development of renewable energy.

7.4.4 Additional environmental impacts

There are no additional environmental impacts of the proposed development that are relevant to agriculture.

7.4.5 No-go areas

Due to the effectively uniform agricultural conditions across the site, and the low agricultural impact, it is not necessary to demarcate no-go areas for development, and no agricultural buffers are required.

7.4.6 Comparative assessment of alternatives

Due to the effectively uniform agricultural conditions across the site, and the low agricultural impact, there will be absolutely no material difference between the agricultural impacts of any of the proposed alternatives, or any changes to the proposed layout. All alternatives are considered acceptable.

7.4.7 Micro-siting

For the same reasons that justify the two sections above, micro-siting of the development

infrastructure will have an insignificant affect on agricultural impacts.

7.5 Impact statement

The conclusion of this assessment is that the proposed development 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 land is of limited agricultural potential and that the actual amount of agricultural land loss is small.

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

8 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 1: 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	Ensure that the storm water run-off control is included in the engineering design.	Once-off during the design phase.	Holder of the EA

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		points and it must prevent any potential down slope erosion.			

Table 2: 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 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.	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 action must be implemented to the run-off control system in the event of any erosion occurring.	Every 2 months during the construction phase	Environmental Control Officer (ECO)

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

Table 3: Management plan for the operational phase

Impact	Mitigation /	Mitigation /	Monitoring

	management objectives and outcomes	management actions	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 action must be implemented to the run-off control system in the event of any erosion occurring.	Bi-annually	Facility Environmental Manager
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 4: Management plan for the decommissioning phase

Impact	Mitigation /	Mitigation /	Monitoring

	management objectives and outcomes	management actions	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 disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	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 action must be implemented to the run-off control system in the event of any erosion occurring.	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)
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	Record GPS positions of all	As required, whenever areas	Environmental Control Officer

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

9 CONCLUSIONS

The proposed site is identified by the screening tool as being of predominantly high and very high sensitivity for agricultural resources, as a result of its relatively high land capability values. The high land capability is a result of the deep soils and high rainfall. However, despite this, other factors prevent the land from being viable arable land and limit its agricultural land use to grazing only.

What is of most importance for agricultural impact is that, despite the high sensitivity rating, the land is actually of limited agricultural value. Because it is not viable arable land, it is not considered particularly preservation worthy as agricultural production land.

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 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 land is of limited agricultural potential and that the actual amount of agricultural land loss is small.

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.

10 REFERENCES

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APPENDIX 1: LAND TYPE DATA FOR THE SITE

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Ac111	Hutton	900 - 1200	35 - 65	35 - 65	so	30
	Hutton	50 - 1200	35 - 55	35 - 55	so	12
	Katspruit	200 - 400	25 - 45		gc	8
	Griffin	600 - 1200	35 - 55	35 - 65	so	7
	Clovelly	600 - 1200	15 - 35	15 - 35	so	7
	Rock outcrop					7
	Mispah / Westleigh	200 - 600	15 - 35	0 0 0	sp,hp	4
	Streams					3
	Champagne	200 - 400	20 - 35	0 0 0	U	3
	Avalon	600 - 1200	15 - 35	15 - 35	so	3
	Griffin	600 - 1200	15 - 35	15 - 35	so	3
	Clovelly	600 - 1200	35 - 55	35 - 55	so	3
	Hutton	900 - 1200	35 - 55	35 - 55	so	3
	Hutton	600 - 1200	15 - 35	15 - 35	so	3
	Mispah	200 - 300	10 - 25	0 0 0	R	3
	Dundee	400 - 1200	10 - 25	0 0 0	U	2
	Pinedene	600 - 1200	35 - 55	35 - 55	so	2

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

CONSTRUCTION AND OPERATION OF A BATTERY ENERGY STORAGE SYSTEM (BESS) AND ASSOCIATED INFRASTRUCTURE FOR THE AUTHORISED WAAIHOEK WIND FARM LOCATED SOUTH-EAST OF UTRECHT, IN KWA-ZULU NATAL

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:

08/10/2020

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

08/10/2020

Date

7214527 7 CONSTABLE
A.F. MASEH-MZINGELWA

Signature of the Commissioner of Oaths

2020/10/08

Date

SUID-AFRIKAANSE POLISIEDIENS
STATIONSKOMMANDER
09 OCT 2020
SOUTH AFRICAN POLICE SERVICE