APPENDIX

H SPECIALIST STUDIES

APPENDIX

H-1 AGRICULTURE

Johann Lanz
Soil Scientist (Pr.Sci.Nat.)
Reg. no. 400268/12

Cell: 082 927 9018
e-mail: johann@johannlanz.co.za

1A Wolfe Street
Wynberg
7800
Cape Town
South Africa

SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL AGRO-ECOSYSTEM SPECIALIST ASSESSMENT
FOR
THE PROPOSED MUKONDELELI WIND ENERGY FACILITY
NEAR SECUNDA IN MPUMALANGA PROVINCE

Report by
Johann Lanz

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Table of Contents

EXECUTIVE SUMMARY

The purpose of the agricultural component in the Environmental Authorisation process is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security.

An agricultural impact is a change to the future production potential of land. Whether a development should receive agricultural approval or not should be evaluated by asking the question: Does the loss of future agricultural production potential that will result from this development, justify keeping the land solely for agricultural production and therefore not approving the development?

The single most important aspect of the agricultural impact of the proposed wind farm is that it excludes an insignificantly small proportion of land (less than 1%) from agricultural production and consequently has an insignificantly small impact on the future production potential of the farmland on which it is located. Farming will be able to continue with the development and with no discernible change as a result of it. All other considerations about agricultural impact become largely irrelevant in the light of this fact, but are still considered in the assessment for compliance purposes.

South Africa needs agricultural production for food security. It also urgently needs renewable energy development. In order to achieve its renewable energy generation goals, agriculturally zoned land will inevitably need to be used for renewable energy generation. The ideal, win-win scenario for both agricultural production and for electricity generation in South Africa, is for renewable energy facilities to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of future agricultural production potential. In this scenario, renewable energy development does not pose a threat to agricultural production or to the agricultural economy of rural areas.

The conclusion of this assessment is that the proposed development offers such a win-win scenario predominantly because it will cause insignificant loss of future agricultural production potential. This is because, although the development impinges on agriculturally productive cropland, it only excludes an insignificantly small proportion of the land (less than 1%) from agricultural production. The amount of agricultural land loss is well within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable arable land and therefore to steer, particularly renewable energy developments, onto land of lower production potential.

In addition, the agricultural impact of the proposed development is assessed as acceptable

because:

The proposed development will generate a reliable and predictable additional income that will improve the financial security for farming operations on the site, without significantly compromising the existing farming production or income.

1. The proposed development offers security benefits against stock theft and other crime.
2. The proposed development offers an improved road network, with associated storm water handling system, that provides improved vehicle access for farming operations.
3. It is the net sum of positive and negative effects that determines the overall agricultural impact. Tiny losses of agricultural land are likely to be more than compensated for by the positive impacts, so that the net overall impact is likely to be positive.
4. The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by standard best practice mitigation management actions.
5. The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
6. In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
7. All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable because of the above factors, with the net overall impact likely to be positive. Therefore, 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 Mukondeleli Wind Energy Facility (WEF) near Secunda in Mpumalanga Province (see location in Figure 1). In terms of the National Environmental Management Act (Act No 107 of 1998 - NEMA), an application for environmental authorisation requires an agricultural assessment, in this case an Agricultural Agro-Ecosystem Specialist Assessment.

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

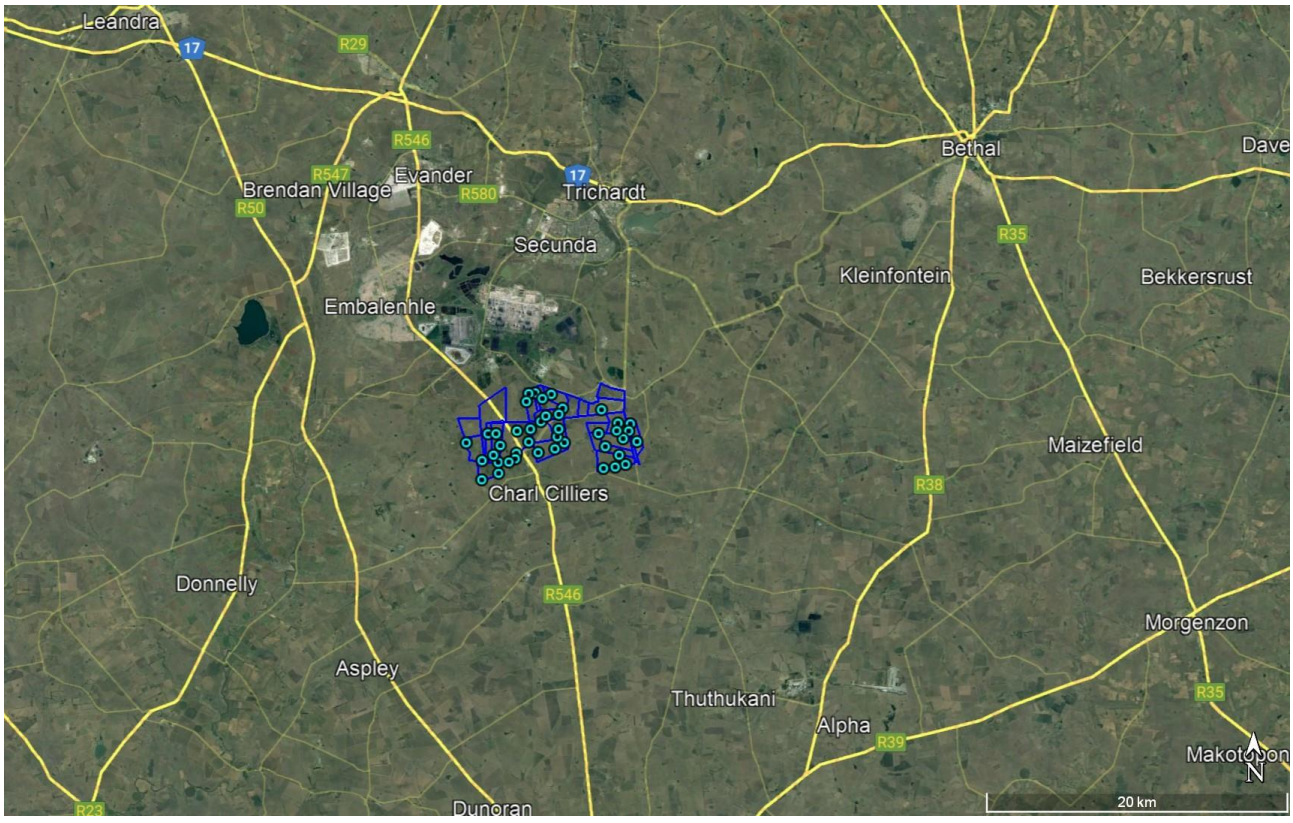

Figure 1. *Locality map of the proposed energy facility (farm boundaries in blue and turbines in light blue) to the south of the town of Secunda.*

The purpose of the agricultural component in the Environmental Authorisation process is to preserve the agricultural production potential of, particularly scarce arable land, by ensuring that development does not exclude existing or potential agricultural production from such land or impact it to the extent that its future production potential is reduced. In this case, the small extent of land loss means that there is an insignificant effect on the crop production potential of the site.

2 PROJECT DESCRIPTION

The proposed facility will consist of the standard infrastructure of a wind energy facility including, up to 42 turbines with foundations; crane pads per turbine; internal access roads; operations and maintenance building; battery storage; on-site substation; and temporary laydown areas and will have a total export capacity of up to 300MW. The grid connection infrastructure is subject to a separate assessment and EA.

The exact nature of the different components making up a wind energy facility has absolutely no bearing on the significance of agricultural impacts. All that is of relevance is simply the layout and extent of the total footprint of the facility that excludes agricultural land use or impacts agricultural land, referred to as the agricultural footprint. Whether that footprint comprises a crane pad, a road or a building is irrelevant to agricultural impact.

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 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 hence 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. The protocol also requires that a Site Sensitivity Verification be done.

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:
    1. the extent of the impact of the proposed development on the agricultural resources (Section 9.11);
    2. whether or not the proposed development will have an unacceptable negative impact on the agricultural production capability of the site (Section 9.13), 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:
    1. The soil form/s, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit and slope (Sections 8.1 & 8.2);
    2. Where applicable, the vegetation composition, available water sources as well as agro-climatic information (Sections 8.3, 8.4 & 8.5);
    3. 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 8.8);
    4. The current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure (Section 8.9);
    5. Existing impacts on the site, located on a map where relevant (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc.)(Section 8.10).
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:
    1. Change in productivity for all agricultural activities based on the figures of the past 5 years, expressed as an annual figure and broken down into production units (Section 9.12);
    2. Change in employment figures (both permanent and casual) for the past 5 years expressed as an annual figure (Section 9.12);
    3. Any alternative development footprints within the preferred site which would be of “medium” or “low” sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification (Section 9.5).
6. The findings of the Agricultural Agro-Ecosystem Specialist Assessment must be written up in an Agricultural Agro-Ecosystem Specialist Report that contains as a minimum the following information:
    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 2);
    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 (Section 9.12);

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 9.6);
8. Additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc. (Section 9.7);
9. Information on the current agricultural activities being undertaken on adjacent land parcels (Section 8.6);
10. a motivation must be provided if there were development footprints identified as per point 5.3 above that were identified as having a medium or low agricultural sensitivity and that were not considered appropriate (not applicable);
11. Confirmation from the soil scientist or agricultural specialist that all reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities (Section 9.8);
12. A substantiated statement from the soil scientist or agricultural specialist with regards to agricultural resources on the acceptability or not of the proposed development and a recommendation on the approval or not of the proposed development (Section 9.13);
13. Any conditions to which this statement is subjected (Section 11);
14. Where identified, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr) (Section 10);
15. A description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).
16. calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development (including supporting infrastructure) (Section 9.9);
17. confirmation whether the development footprint is in line with the allowable development limits set in Table 1 above, including where applicable any deviation from the set development limits and motivation to support the deviation, including (Section 9.9):
    a. where relevant, reasons why the proposed development footprint is required to exceed the limit;
    b. where relevant, reasons why this exceedance will be in the national interest; and
    c. where relevant, reasons why there are no alternative options available including evidence of alternatives considered; and
18. a map showing the renewable energy facilities within a 50km radius of the proposed development (Appendix 4)

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing soils and agricultural potential

The assessment was based on an on-site investigation of the soils and agricultural conditions and was also informed by existing 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 (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 Crop Estimates Consortium, 2019. *Field Crop Boundary data layer, 2019*. Pretoria. Department of Agriculture, Forestry and Fisheries
- 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.

The aim of the on-site Site Sensitivity Verification was to:

1. ground-truth cropland status and consequent agricultural sensitivity;
2. ground truth the land type soil data and achieve an understanding of the general range and distribution patterns of different soil conditions across the site;
3. gain an understanding of overall agricultural production potential across the site.

This was achieved by a drive and walk-over investigation across the site. The site investigation was conducted on 13 October 2021. Interviews were also conducted with farmers, Dewald Te Water and Johannes De Jager, to get details of farming practices on the site.

The soil investigation was based on the investigation of existing excavations and exposures, soil auger samples as well as indications of the surface conditions and topography. Soils were classified according to the South African soil classification system (Soil Classification Working Group, 1991). This level of soil assessment is considered entirely adequate for an understanding of on-site soil

potential for the purposes of a wind farm assessment. For this purpose, only an understanding of the general range and distribution patterns of different soil conditions across the site is required. A more detailed soil survey would be extremely time consuming and impractical to conduct and would not provide any additional data that would add value to the assessment of the agricultural impact of a wind farm.

This is because a wind farm extends over a very large surface area. The layout design of a wind farm is complex and there are multiple interacting factors that determine the turbine locations that will ensure the viability of the wind farm. Each turbine influences the amount of wind that the other turbines receive. Therefore, the location of one turbine cannot simply be shifted without requiring other turbines to be shifted as well, in order to retain the viability of all the turbines. To shift turbines to account for variation in soil conditions would be extremely complex and would require a level of soil mapping detail across the whole wind farm area that would be practically impossible to achieve.

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 spring has no bearing on its results.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

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

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

A renewable energy facility requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) if the facility is on agriculturally zoned land. There are two approvals that apply. The first is a No Objection Letter for the change in land use issued by the Deputy Director General (Agricultural Production, Health and Food Safety, Natural Resources and Disaster Management). This letter is one of the requirements for receiving municipal rezoning. It is advisable to apply for this as early in the renewable development process as possible because not receiving this DALRRD approval is a fatal flaw for a project. Note that a positive EA does not assure DALRRD's approval of this. This application requires a detailed agricultural potential assessment of the site that provides good evidence of why the impact of the development on the future agricultural production potential of the site is acceptable.

The second required approval is a consent for long-term lease in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). If DALRRD approval for the development has already been obtained in the form of the No Objection letter, then SALA approval should be easy and not

present any difficulties. Note that SALA approval is not required if the lease is over the entire farm portion. SALA approval (if required) can only be applied for once the Municipal Rezoning Certificate and EA is in hand.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as "any act by means of which the topsoil is disturbed mechanically". The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of a renewable energy facility and its associated infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.

7 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 is a direct function of the capability of the land for agricultural production. All arable land that can support viable crop production, is classified as high (or very high) sensitivity. This is because there is a scarcity of arable production land in South Africa and its conservation for agricultural use is therefore a priority. Land which cannot support viable crop production is much less of a priority to conserve for agricultural use, and is rated as medium or low agricultural sensitivity.

It is important to recognise that the agricultural sensitivity of land, in terms of a particular development, is not only a function of the screening tool sensitivity, but is also a function of the severity of the impact which that development poses to agriculture. This is not recognised in the screening tool classification of sensitivity. The agricultural impact of wind farms is completely constrained by their very small agricultural footprint and the screening tool sensitivity of the land actually has very little influence on the significance of the agricultural impacts of a wind farm (see

Section 9).

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not. All cropland is classified as at least high sensitivity, based on the logic that if it is under crop production, it is indeed suitable for it, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. 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, based on its soil, climate and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

A map of the proposed development overlaid on the screening tool sensitivity is given in Figure 2, below. The land capability of the site on the screening tool is predominantly 8, but varies from 5 to 9. The small scale differences in land capability across the project area are not very accurate or significant at this scale and are more a function of how the land capability data is generated by modelling, than actual meaningful differences in agricultural potential on the ground. Values of 5 translate to a low agricultural sensitivity, values of 6 to 8 translate to a medium agricultural sensitivity, and values of 9 translate to a high agricultural sensitivity. However, there are only a few, isolated pixels across the site that are of a land capability value of 9, and they are therefore not very significant.

In reality the soils (and therefore the land capability) vary in a fairly complex pattern across the landscape, which is not reflected at the scale of the land capability data and cannot practically be achieved through soil mapping. The most reliable indication of soil cropping potential is historical land use. The suitable versus the unsuitable soils have been identified over time through trial and error. In an agricultural environment like the one being assessed, all the suitable soils are generally cropped, and uncropped soils can therefore fairly reliably be considered to have limitations that make them unsuitable for crop production.

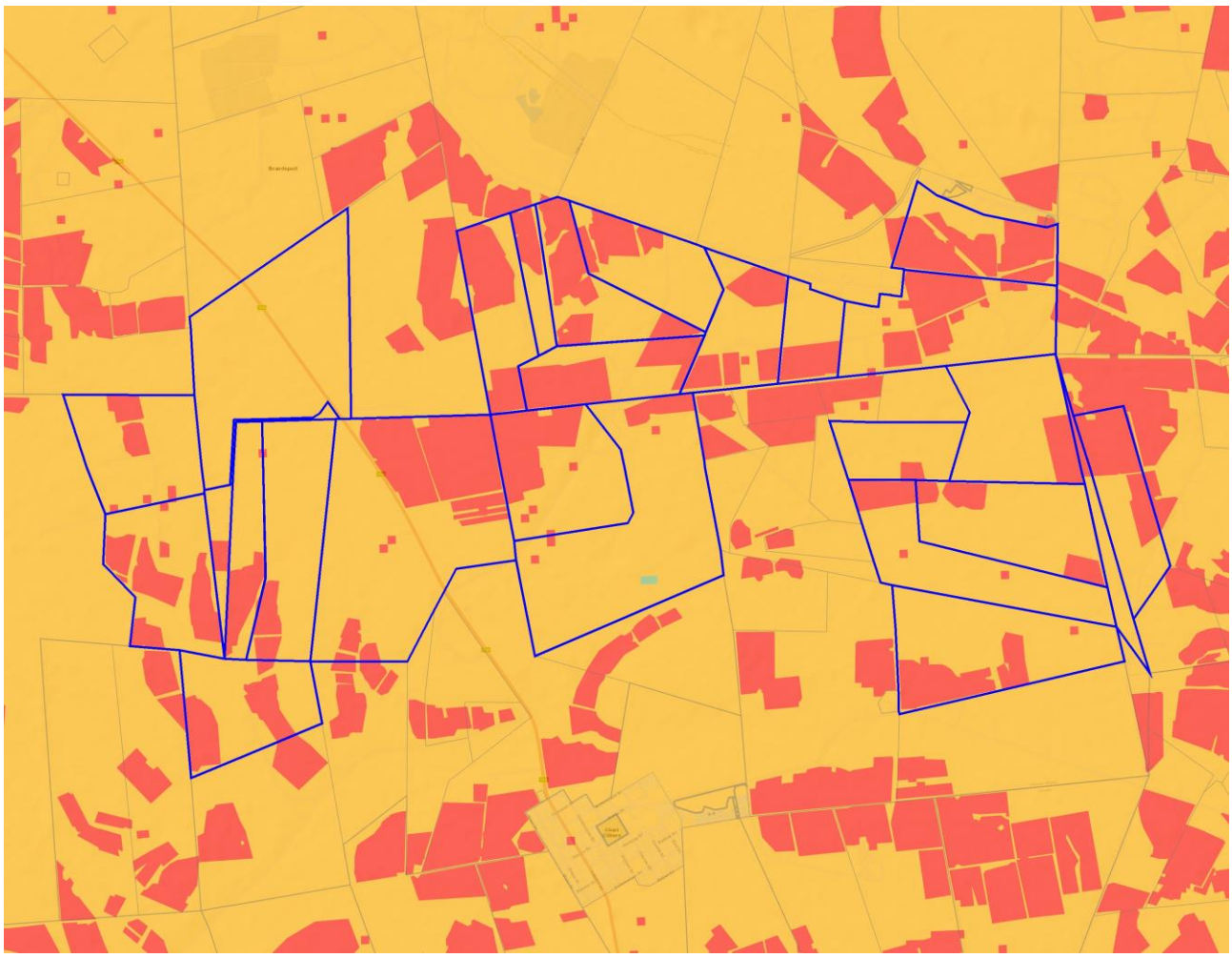

Figure 2. *The proposed development area overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).*

The allocation of high sensitivity to parts of the site (red in Figure 2) are because these parts are classified as cropland in the data set used by the screening tool. However, that data set is outdated. On this site, the extent of cropland has only slightly reduced since the data set for the screening tool was obtained. The suitability for cropping changes with a changing agricultural economy. Slightly poorer soils that may have been cropped with economic viability in the past, are abandoned as cropland because they become too marginal for viable crop production in a more challenging agricultural economy with higher input costs.

This site sensitivity verification verifies those parts of the site that are indicated as cropland in Figure 2 as being of high agricultural sensitivity and the rest of the site as being of medium agricultural sensitivity.

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The purpose of this section of the report is to present the baseline information that controls the

agricultural production potential of the site and then, based on that information, to make an assessment of the production potential. That assessment is provided near the end of this section in sub-section 8.7.

A satellite image map of the agricultural footprint of the proposed energy facility is shown in Figure 3 and photographs of site conditions and soils are shown in Figures 4 and 5.

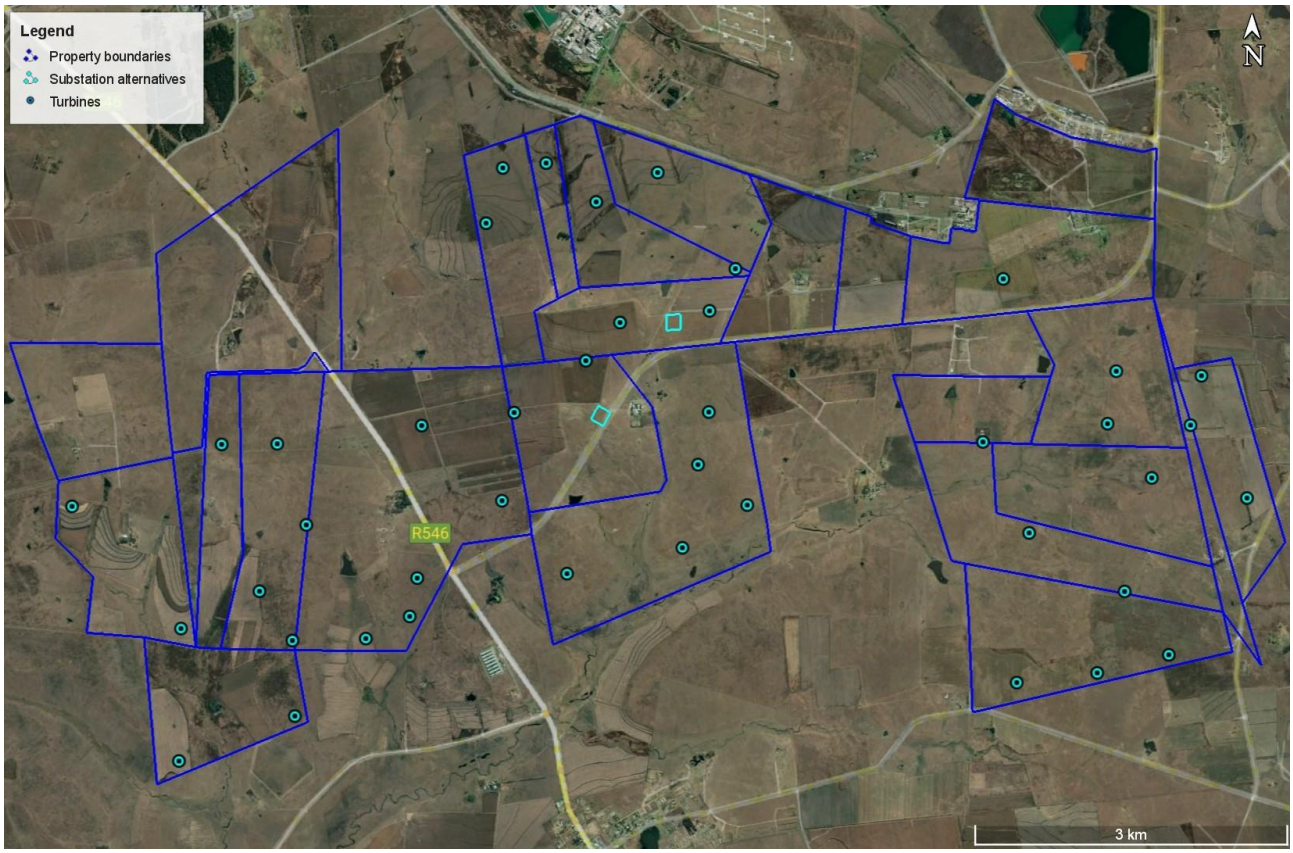

Figure 3. *Satellite image map of the proposed facility.*

8.1 Soils

The entire site falls within one land type (see table of soil data in Appendix 4). The geology is dolerite as well as sandstone, grit and shale of the Vryheid formation of the Ecca group. The soils are predominantly high clay content, dark coloured vertic and melanic soils, underlain by rock in upland positions and clay in bottomland positions. Soil forms are Arcadia, Rensburg, Valsrivier, Swartland, Mayo and Milkwood. The agricultural potential of the soils is limited variously by the very high clay content, shallow depth and drainage limitations.

Figure 4. *View of typical lands not used for crop production but used for grazing.*

Figure 5. *View of croplands on the site.*

8.2 Terrain and slope

The site is situated on elevated, slightly hilly terrain at an altitude of between 1,590 and 1,630 metres with gentle slopes up to about 3%.

8.3 Available water sources

There is no irrigated crop production on the site.

8.4 Vegetation

Natural vegetation of the site is Soweto Highveld Grassland, which has been disturbed by agricultural activities.

8.5 Agro-climatic information

The site has a summer rainfall with a mean annual rainfall of between 619 and 664 mm and a mean annual evaporation of between 1,290 and 1,320 mm (Schulze, 2009).

8.6 Land use and development on and surrounding the site

The site is located in a grain farming agricultural region, but the soils vary in their suitability for crop production. Because of the favourable climate and the fairly high grain yields, farmers in the area utilise all suitable soil for grain production. Only soil that is not suitable for grain production is used for cattle and sheep grazing. Limitations that render the soil unsuitable for grain production are depth limitations due to rock or dense clay in the subsoil, and the limited drainage associated with the dense, poorly drained clay layers in the subsoil. The grazing lands are *rooigras* (*Themeda triandra*) grasslands. Grass fields are burned or mowed from time to time.

Most of the farm portions on which the facility is located, form only a small part of a much bigger farming operations that utilise several different farms.

8.7 Agricultural potential and productivity

Because of the favourable climate, grain yields are fairly high but are constrained by the generally shallower soils. Average maize yields are around 5 tons per hectare. The long-term grazing capacity of the farm is fairly high at 5 hectares per large stock unit.

8.8 Agricultural employment

The farms on the site operate with only a small number of labourers.

8.9 Existing impacts on the site

There are no existing impacts on the site that are relevant to agricultural impact.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 What constitutes and agricultural impact?

An agricultural impact is a temporary or permanent change to the future production potential of land. If a development will not change the future production potential of the land, then there is no agricultural impact. A decrease in future production potential is a negative impact and an increase is a positive impact. The significance of the agricultural impact is directly proportional to the extent of the change in production potential.

9.2 The significance of agricultural impact and the factors that determine it

The purpose of the agricultural component in the Environmental Authorisation process is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security.

When the agricultural impact of a development involves the permanent or long term non-agricultural use of potential agricultural land, as it does in this case, the focus and defining question of the agricultural impact assessment is to determine the importance, from an agricultural production point of view, of that land not being utilised for the development and kept solely for agriculture.

In other words, the significance of an agricultural impact should be evaluated by asking the question: Does the loss of future agricultural production potential that will result from this development, justify keeping the land solely for agricultural production and therefore not approving the development? If the loss is small, then it is unlikely to justify non approval. If the loss is big, then it is likely to justify it.

The extent of the loss is a direct function of two things, firstly the amount of land that will be lost and secondly, the production potential of the land that will be lost. In the case of wind farms, the first factor, amount of land loss, is so small that the total extent of the loss of future agricultural

production potential is insignificantly small, regardless of how much production potential the land has. This is because the required spacing between turbines means that the amount of land actually excluded from agricultural use is extremely small in relation to the surface area over which a wind farm is distributed. Wind farm infrastructure (including all associated infrastructure and roads) typically occupies less than 2% of the surface area, according to the typical surface area requirements of wind farms in South Africa (DEA, 2015). Most wind energy facilities, for which I have recently done assessments, occupy less than 1% of the surface area. All agricultural activities are able to continue unaffectedly on all parts of the farmland other than this small agricultural footprint and the actual loss of production potential is therefore insignificant.

Furthermore, wind farms have both positive and negative affects on the production potential of land (see Section 9.3). The significance of the small loss of production potential is reduced even more because it is compensated by the positive impacts that enhance production potential.

A study done to measure the impact of existing wind farms on agricultural production potential (Lanz, 2018) is highly informative of the extent of the agricultural impact that is likely for this proposed development. Although the study was done in a different agricultural environment, it is similar in terms of being a highly productive and intensively farmed environment with cultivation. There is no reason that the results obtained in that study would not be applicable to the area in this assessment. The overall conclusion of the study was that, although wind farms have been established within an area of cultivated farmland that supports intensive and productive farming, it is highly unlikely that this has caused a reduction in agricultural production. Small amounts of production land have been lost, but the consequence of this for agricultural production has been negligible. It is likely that the positive financial impacts of wind farming have outweighed the negative impacts and that wind farming has benefited agriculture and agricultural production in the area.

Another aspect to consider is the scale at which the significance of the agricultural impact is assessed. The change in production potential of a farm or significant part of a farm is likely to be highly significant at the scale of that farm, but may be much less so at larger scales. This assessment considers a regional and national scale to be the most appropriate one for assessing the significance of the loss of agricultural production potential because, as has been discussed above, the purpose is to ensure the conservation of agricultural land required for national food security.

9.3 Impact identification

Two direct impacts have been identified that lead to decreased agricultural potential by:

1. **occupation of land** - Agricultural land directly occupied by the development infrastructure

will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. This is relevant only in the construction phase. No further occupation of agricultural land occurs in subsequent phases. As has been discussed above, the small and widely distributed nature of the agricultural footprint of the facility means that only an insignificant proportion of the available agricultural land is impacted in this way.

2. **soil erosion and degradation –** Erosion can occur as a result of the alteration of the land surface run-off characteristics, predominantly through the establishment of hard surface areas including roads, and through the disturbance of existing contour bank systems that control erosion. Soil erosion is completely preventable. The storm water management that will be an inherent part of the road engineering on site and standard, best practice erosion control measures recommended and included in the EMPr, are likely to be effective in preventing soil erosion. Loss of topsoil can result from poor topsoil management during construction related excavations.

Three positive agricultural impacts have been identified, that are indirect impacts and lead to an increase in agricultural potential through:

1. **increased financial security for farming operations -** Reliable and predictable income will be generated by the farming enterprises through the lease of the land to the energy facility. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased investment into farming.
2. **improved security against stock theft and other crime** due to the presence of security infrastructure and security personnel at the energy facility.
3. **an improved road network**, with associated storm water handling system. The wind farm will construct turbine access roads of a higher standard than the existing farm roads which will give farming vehicles better access to farmlands. This will be especially relevant during wet periods when access to croplands for spraying etc is limited by the current farm roads.

Considering what is detailed in Section 9.2 above, the extent to which any of these mechanisms is likely to actually affect levels of agricultural production is small and the overall impact of a change in agricultural production potential is therefore small.

There are three additional impacts, but because they are highly unlikely to have an impact on agricultural production, they are not considered further. They are:

- **Prevention of crop spraying by aircraft over land occupied by turbines** – ground based or using drones for spraying are effective, alternative methods that can be used without implications for production or profitability.

- **Interference with farming operations** - Construction (and decommissioning) activities are likely to have some nuisance impact for farming operations but are temporary and highly unlikely to have an impact on agricultural production. The presence of turbines and turbine access roads within fields will also have some nuisance impact for farming operations in that farming traffic will need to divert around them. But again this is highly unlikely to have an impact on agricultural production.

9.4 Cumulative impacts

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.

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 future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this:

> What loss of future agricultural production potential 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.

DFFE compliance for this project requires quantifying the impact of all renewable energy applications within a 55 km radius. There are a total of five renewable energy project applications within 55 km of the proposed site. These are listed in Appendix 3 of this report.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the five developments (total generation capacity of 955 MW) will amount to a total of approximately 1112 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 55 km radius (approximately 950,300 ha), this amounts to only 0.12% of the surface area. That is considered to be within an acceptable limit in terms of loss of agricultural land.

All of these projects have the same agricultural impacts in a very similar agricultural environment, and therefore the same mitigation measures apply to all.

As discussed above, the risk of a loss of agricultural potential by soil degradation can effectively be mitigated for renewable energy developments. If the risk for each individual development is low, then the cumulative risk is also 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.

9.5 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. There are no agricultural impacts of the no-go alternative.

The development offers an additional income source to agriculture, without excluding agriculture from the land. Therefore, the negative agricultural impact of the no-go alternative is more significant than that of the development, and so, purely from an agricultural impact perspective, the proposed development is the preferred alternative between the development and the no-go. In addition, the no-go option would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of renewable energy in South Africa.

9.6 Alternative development footprints and comparative assessment of alternatives

The agricultural protocol requires identification of 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.

It can be seen in Figure 3 that several of the turbines are located within croplands. This is because the turbines require the higher lying land for viability, which often coincides with cropland. The positioning of turbines in a wind farm is complex and there are multiple, interacting factors that determine the locations that will ensure the viability of the wind farm. Each turbine influences the amount of wind that the other turbines receive. Therefore, the location of one turbine cannot simply be shifted without requiring other turbines to be shifted as well, in order to retain the viability of all the turbines. Turbines cannot therefore simply be shifted off the cropland. However, as has been discussed above, the agricultural impact of these turbines within croplands is so small that it does not make sense to compromise the viability of the wind farm, to make only an insignificant change to the agricultural impact.

Design and layout alternatives are unlikely to make any material difference to the significance of the agricultural impacts. The same applies to technology alternatives, and there are therefore no preferred alternatives from an agricultural impact perspective. All alternatives are considered acceptable.

9.7 Long term project benefits versus agricultural benefits

The development will generate a significant (at the scale of an individual farm) and reliable additional income for the directly affected farming enterprises, without compromising the existing farming income. It will also generate additional income and employment in the local economy. In addition, it will contribute to the country's need for energy generation, particularly renewable energy that has lower environmental and agricultural impact on a national scale than existing, coal powered energy generation.

9.8 Additional environmental impacts

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

9.9 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. The issue of turbines within croplands has been addressed in Section 9.6 above. An aspect of wind farm layout that can cause unnecessary fragmentation of croplands is the location of turbine access roads within croplands. All access roads should be laid out on existing roads and on the edges of croplands wherever possible, so that croplands are not unnecessarily fragmented. This micro-siting aspect must be checked during the final micro-siting walk-through exercise that occurs after Environmental Authorisation and prior to construction.

9.10 Impact footprint

The agricultural protocol achieves its purpose, in relation to renewable energy developments on agricultural land, by imposing allowable development limits on different agricultural sensitivity categories of land. The allowable development footprint is the area of a particular sensitivity category of land that can be directly occupied by the physical footprint of a renewable energy development. There are six different allowable development footprints, defined according to a combination of land capability and cropping status, as specified in Table 1, below.

Table 1: Allowable development limits as specified in the agricultural protocol.

Allowable footprint category	Agricultural sensitivity on screening tool	Allowable footprint (ha/MW)	Definition of category
1	Very high	0.00	Land capability of 11-15; or irrigated land; or dryland horticulture or viticulture
2	High	0.20	Land capability of 8-10 on existing field crops
3	High	0.25	Land capability of 6-7 on existing field crops
4	High	0.30	Land capability of 1-5 on existing field crops
5	High	0.35	Land capability of 9-10 outside of existing field crops
	Medium		Land capability of 8 outside of existing field crops
6	Medium	2.5	Land capability of 6-7 outside of existing field crops
	Low		Land capability of 1-5 outside of existing field crops

The proposed wind farm is distributed over a range of different allowable footprint categories across the site. The detailed calculation of the compliance of the wind farm to the development limits can only be made once a finalised road layout footprint is available. This will only be finalised after the EIA phase, at final layout approval phase. However, an initial estimation determines that the development will be well within the allowable limits.

9.11 Mitigation measures

Mitigation measures to prevent soil degradation are all inherent in the project design and / or are standard, best-practice for construction sites.

- A system of storm water management, which will prevent erosion, will be an inherent part of the road engineering on site. As part of this system, the integrity of the existing contour bank systems of erosion control on croplands, where they occur on steeper slopes, must be kept intact. 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.

- Any excavations during the construction phase, in areas that will be rehabilitated to agricultural land at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. On areas that are only cleared, like construction lay down areas, it is much better to leave the topsoil in place.

9.12 Impact assessment

An Agricultural Agro-Ecosystem Specialist Assessment is required by the protocol to identify the extent of the impact of the proposed development on agricultural resources. The assessment of the extent of the impact is summarised in the Table 2.

As discussed in Section 9.1, the consequence of an impact is a direct function of the degree to which that impact will affect future agricultural production potential.

Agricultural potential loss by land occupation occurs only on the site and for the lifetime of the development. Its consequence is considered slight because so little land is excluded from agricultural use. For the same reason, the irreplaceability is considered low. The probability of this impact is very likely. Its reversibility is considered high, because after decommissioning the land can be returned to agricultural land use.

Agricultural potential loss by degradation occurs only on the site and only during the construction and decommissioning phases. Its consequence is considered slight because the soil is not particularly susceptible to degradation. Irreplaceability is considered low because of the limited land capability as well. The probability of this impact is unlikely because of the low susceptibility. Its reversibility is considered moderate, because if soil is degraded there is some potential for rehabilitation.

Agricultural potential enhancement through increased financial security for farming operations occurs across the farming operation and during the operational phase. Its consequence is considered slight because increased farm investment is only likely to slightly increase farm productivity. Some financial improvement to farming operations is likely as a result of the additional revenue. Reversibility is considered high because the additional revenue will stop when the operation ceases. Irreplaceability is considered moderate because the additional revenue may not be easy to replace after the operation ceases, although once a renewable energy facility is established, it may well be recommissioned for continued operation.

Table 2: Rating of impacts.

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential mitigation measures	Significance and Ranking (Post Mitigation)	Confidence Level
Construction phase						
Agricultural potential loss by land occupation	**Status**	Negative	Very low (5)	None possible	Very low (5)	High
	Spatial Extent	Site Specific				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				
Agricultural potential loss by soil degradation	**Status**	Negative	Very low (5)	Maintain vegetation and facilitate re-vegetation. Strip, stockpile and re-spread topsoil.	Very low (5)	High
	Spatial Extent	Site Specific				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Operational phase						
Agricultural potential enhancement through increased financial security for farming operations	**Status**	Positive	Very low (5)	None possible	Very low (5)	High
	Spatial Extent	Local				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Moderate				
Decommissioning phase						
Agricultural potential loss by soil degradation	**Status**	Negative	Very low (5)	Maintain vegetation and facilitate re-vegetation. Strip, stockpile and re-spread topsoil.	Very low (5)	High
	Spatial Extent	Site Specific				
	Duration	Long-term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				

9.13 Impacts on agricultural production and employment

The agricultural protocol requires 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. As this assessment has shown, the agricultural use of the land will be integrated with the renewable energy facility and it will continue with no discernible change in terms of

production. The expected losses in production and employment will therefore be zero.

9.14 Impact statement

An agricultural assessment is required by the protocol to 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 agricultural impact of the proposed development will be acceptable because:

1. The proposed development will only exclude an insignificantly small proportion of the land (less than 1%) from agricultural production. The amount of agricultural land loss is well within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable arable land and therefore to steer, particularly renewable energy developments, onto land of lower production potential.
2. The proposed development will generate a reliable and predictable additional income that will improve the financial security for farming operations on the site, without significantly compromising the existing farming production or income.
3. The proposed development offers security benefits against stock theft and other crime.
4. The proposed development offers an improved road network, with associated storm water handling system, that can be used for farming operations.
5. It is the net sum of positive and negative effects that determines the overall agricultural impact. Tiny losses of agricultural land are likely to be more than compensated for by the positive impacts, so that the net overall impact is likely to be positive.
6. The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by standard, best-practice management actions.
7. The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
8. In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
9. All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable because of the above factors. 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 3: 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 4: Management plan for the construction phase

Impact	**Mitigation /**	**Mitigation /**	**Monitoring**

	management objectives and outcomes	management actions	Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
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 5: 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 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 6: 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 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	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		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.	date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.		

11 CONCLUSIONS

The conclusion of this assessment is that the agricultural impact of the proposed development is acceptable because it offers a valuable opportunity for renewable energy development with very little loss of future agricultural production potential.

This is substantiated by the following points:

1. The proposed development will only exclude an insignificantly small proportion of the land (less than 1%) from agricultural production. The amount of agricultural land loss is well within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable arable land and therefore to steer, particularly renewable energy developments, onto land of lower production potential.
2. The proposed development will generate a reliable additional income that will improve the financial security for farming operations on the site, without significantly compromising the existing farming production or income.
3. The proposed development offers security benefits against stock theft and other crime.
4. The proposed development offers an improved road network, with associated storm water handling system, that can be used for farming operations.
5. It is the net sum of positive and negative effects that determines the overall agricultural

impact. Tiny losses of agricultural land are likely to be more than compensated for by the positive impacts, so that the net overall impact is likely to be positive.

6. The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by standard, best-practice management actions.
7. The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
8. In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
9. All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country.

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable because of the above factors. Therefore, 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 only subject to the condition that the micro-siting of the access roads minimizes fragmentation of croplands, wherever possible. This should be assessed and approved by an agricultural specialist during the final micro-siting walk-through exercise that occurs after Environmental Authorisation and prior to construction. A desktop assessment of the road positions using satellite imagery will be adequate for this purpose.

12 REFERENCES

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APPENDIX 1: 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**

Within the past 5 years of running my soil and agricultural consulting business, I have completed more than 170 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, electrical grid infrastructure, urban, and agricultural developments. I was the appointed agricultural specialist for the nation-wide SEAs for wind and solar PV developments, electrical grid infrastructure, and gas pipelines. My regular clients include: Zutari; CSIR; SiVEST; SLR; WSP; Arcus; SRK; Environamics; Royal Haskoning DHV; ABO; Enertrag; WKN-Windcurrent; JG Afrika; 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 2: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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 MUKONDELELI WIND ENEERGY FACILITY NEAR SECUNDA IN MPUMALANGA 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 (Pr.Sci.Nat.) Reg. no. 400268/12 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:

Date 15/11/2022

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

15/11/2022

Date

7161376 NTSHIDI

Signature of the Commissioner of Oaths

2022-11-15

Date

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STATION WYNBERG
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15 NOV 2022
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STATION WYNBERG
SOUTH AFRICAN POLICE SERVICE

APPENDIX 3: PROJECTS INCLUDED IN CUMULATIVE ASSESSMENT

Table 7: Table of all renewable energy applications within a 55 km radius of the proposed development, that were included in the cumulative impact assessment.

DFFE Reference	Project name	Technology	Status	Capacity (MW)
14/12/16/3/3/2/754	Tutuka	Solar	authorised	65.9
14/12/16/3/3/1/452	Forzando North Coal Mine	Solar	authorised	9.5
	Vhuvhili	Solar	proposed	300
Total		**Solar**		**375**
	Impumelelo	Wind	proposed	280
	Mukondeleli	Wind	proposed	300
Total		**Wind**		**580**
Grand Total				**955**

APPENDIX 4: SOIL DATA OF LAND TYPES

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Ea17	Ar	300 - 900	45 - 70		so	57
Ea17	Rg	600 - 1000	45 - 70		gc	16
Ea17	Va	300 - 450	25 - 35	40 - 60	gc,vp	7
Ea17	Sw	200 - 450	25 - 35	40 - 60	lc	6
Ea17	My / Mw	150 - 500	30 - 50	20 - 30	so,R	5
Ea17	Bo	900 > 1200	35 - 50	35 - 50	gc,so	3
Ea17	Av	500 - 900	25 - 30	30 - 40	sp	2
Ea17	We	300 - 450	25 - 30	40 - 50	sp	2
Ea17	Ms / Gs	100 - 250	20 - 30		R,so	2
Ea17	R					2
Ea17	S					1