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# SITE SENSITIVITY VERIFICATION
# AND
# AGRICULTURAL AGRO-ECOSYSTEM SPECIALIST ASSESSMENT
# FOR
# THE PROPOSED CAMDEN 2 WIND ENERGY FACILITY
# NEAR ERMELO IN MPUMALANGA PROVINCE

**Report by**
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**5 August 2022**

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**EXECUTIVE SUMMARY**

The purpose of the agricultural component in an application for Environmental Authorisation 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 extent of 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, approximately 0.8% 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 (0.86%) from agricultural production. The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable 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:

1. 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.
2. The proposed development offers security benefits against stock theft and other crime.
3. The proposed development offers an improved road network, with associated storm water handling system, that provides improved vehicle access for farming operations.
4. 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.
5. 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.
6. The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
7. 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.
8. 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 Camden 2 Wind Energy Facility near Ermelo 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 by assessing the potential agricultural impacts of the proposed development, and based on this, to make a recommendation on whether or not it should be approved.

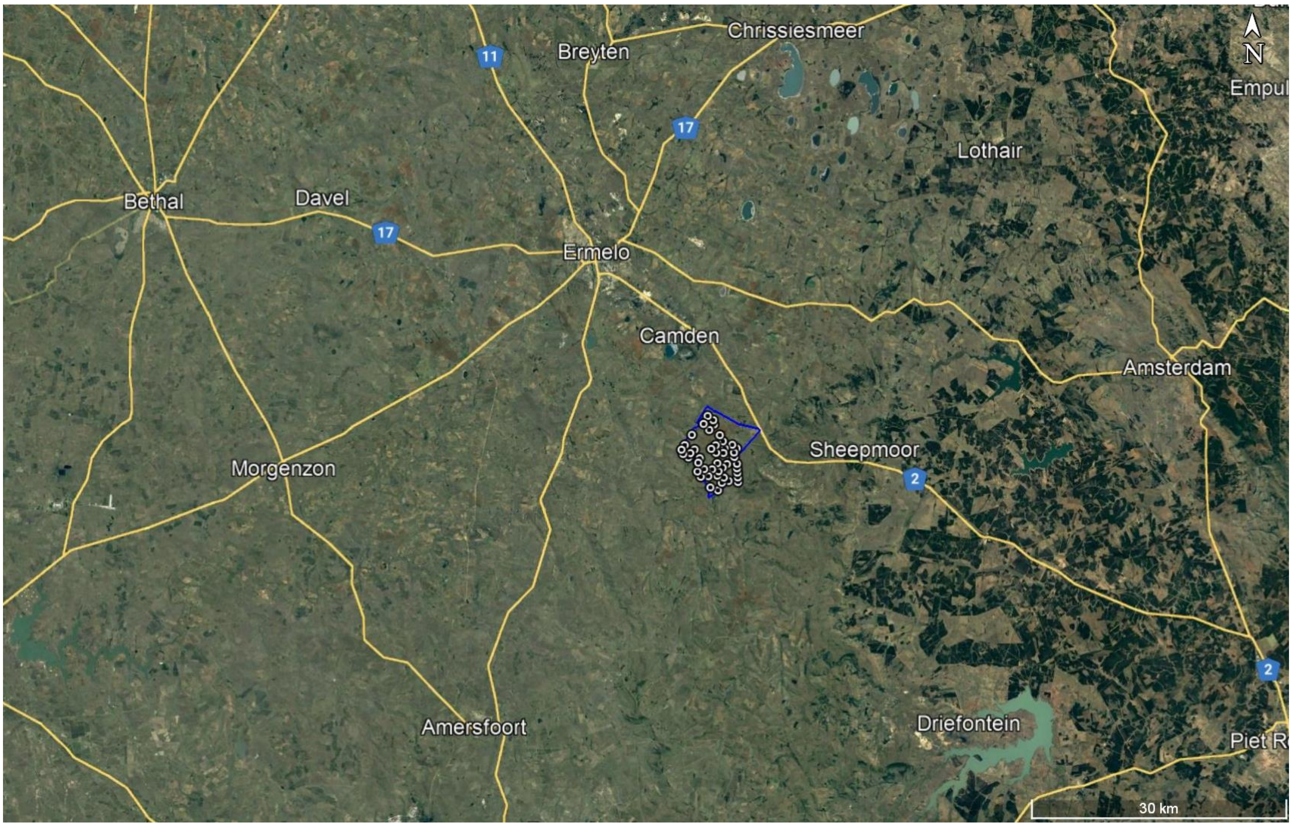


***Figure 1.*** *Locality map of the proposed energy facility (site cadastral boundary in blue and turbines in white) south-east of the town of Ermelo.*

The purpose of the agricultural protocol of NEMA is primarily to preserve the agricultural production potential of scarce arable land by ensuring that development does not exclude agricultural production from such land or impact it to the extent that the crop 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 energy facility will consist of the standard infrastructure of a wind energy facility including, up to 45 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 generating capacity of up to 200MW. 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 building or a substation 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) (Appendix 1).
2. The assessment must be undertaken on the preferred site and within the proposed development footprint (Figure 3).
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 9.12);
    2. whether or not the proposed development will have an unacceptable negative impact

on the agricultural production capability of the site (Section 11), 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 8.7);
    4. The current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure (Section 8.8);
    5. Existing impacts on the site, located on a map where relevant (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc.)(Section 8.9).
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:
    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 9.6).
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 1);
    2. A signed statement of independence by the specialist (Appendix 2);
    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 9.7);
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 9.8);
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 9.9);
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 9.12);
13. Any conditions to which this statement is subjected (Section 9.11 & 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 9.10);
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 9.10):
    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 3)

# 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. Note that Cape Farm Mapper includes national coverage of climate, grazing and certain other data.
- 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 29 and 30 March 2022. An interview was also conducted with farmer, Johan van der Meulen, 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 autumn 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 motivation backed by good evidence that the development will not significantly compromise the future agricultural production potential of the development site.

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 not present any difficulties. Note that SALA approval is not required if the lease is over the entire farm portion, i.e. no subdivision is applicable. 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, as used in the national web-based environmental screening tool, is a direct function of the capability of the land for agricultural production. The general assessment of agricultural sensitivity that is employed in the national web-based environmental screening tool, identifies all arable land that can support viable crop production, 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. So, for example, the sensitivity of an agricultural environment to overhead power lines is not what the screening tool classifies the sensitivity as, because most agricultural environments have a very low sensitivity to overhead power lines. Likewise, 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 area overlaid on the screening tool sensitivity is given in Figure 2. The land capability of the site on the screening tool varies from 5 to 10. 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 to 10 translate to a high agricultural.

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 be unsuitable for crop production. Cropped areas are shown in Figure 3.

Much of the site is classified as high agricultural sensitivity because of both its land capability and because of its status as cropland. The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment.

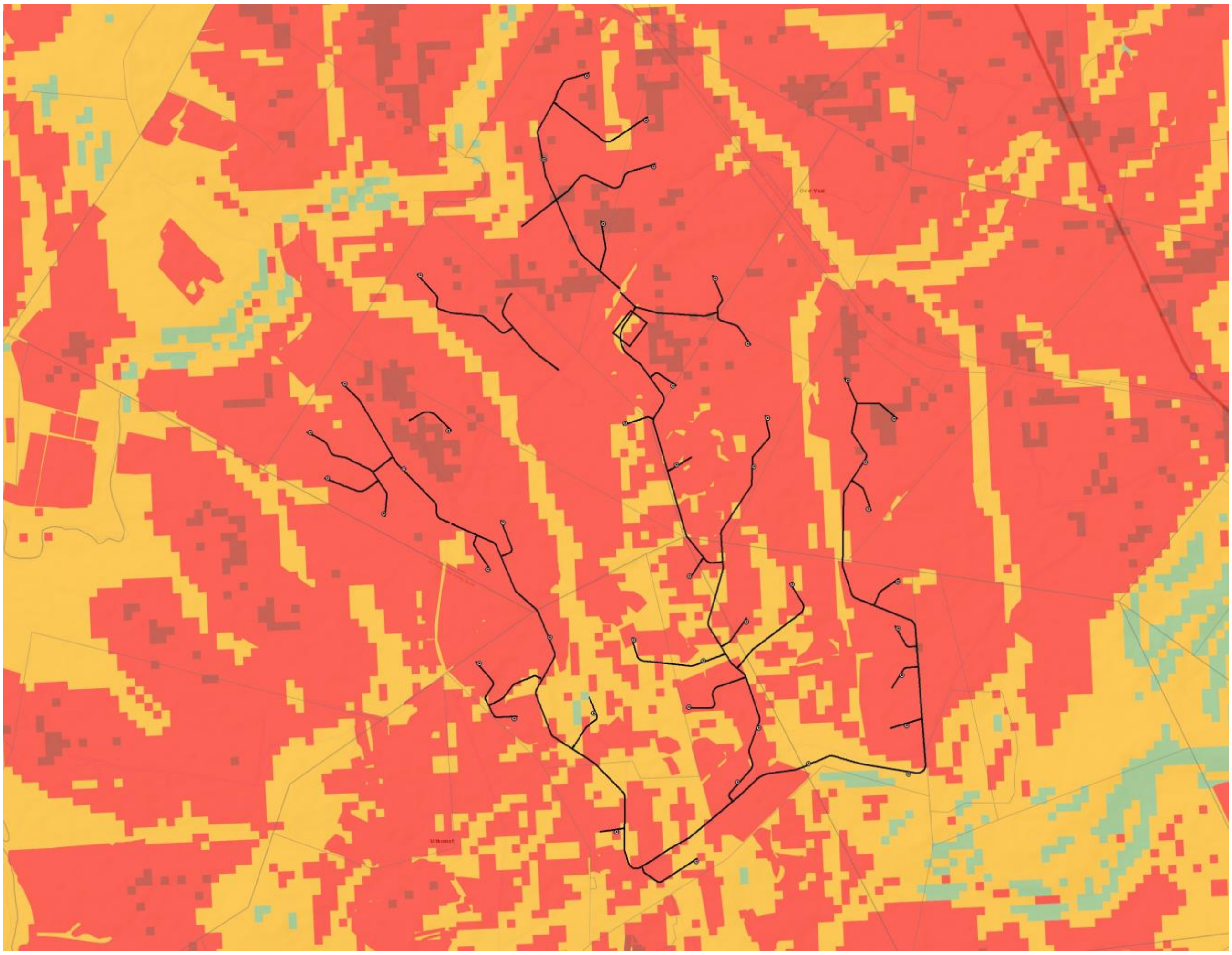

***Figure 2.*** *The proposed development footprint (black lines, with turbines indicated) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).*

## 8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The aim 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 project is shown in Figure 3 and photographs of site conditions and soils are shown in Figures 4 to 6.

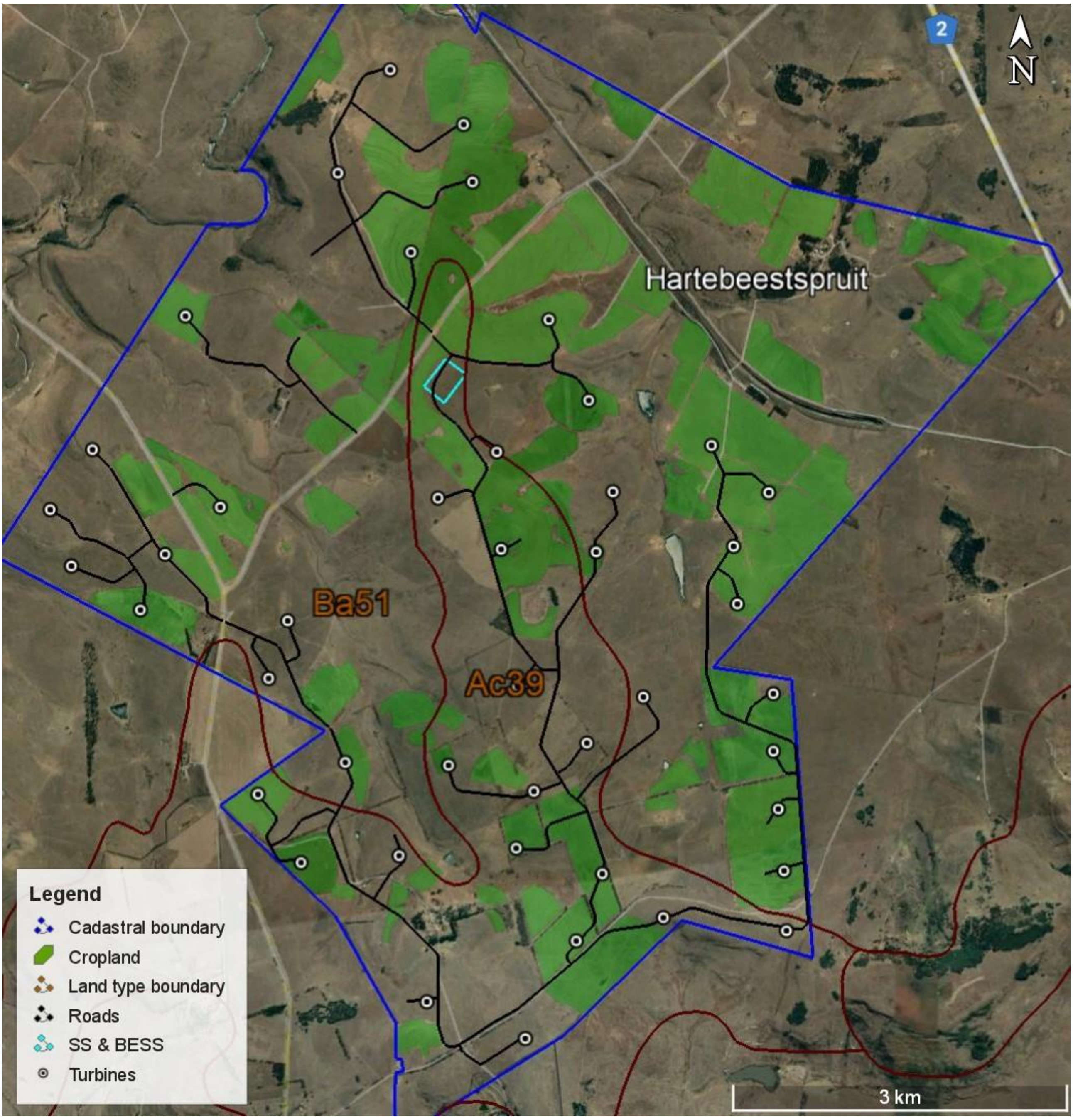

***Figure 3.*** *Satellite image map of the proposed facility.*

### 8.1 Soils

The footprint falls across two land types, Ba51 and Ac39 (see table of soil data in Appendix 4). The geology is predominantly shale and sandstone of the Ecca Group of the Karoo Supergroup and includes dolerite. Approximately half of both land types comprise deep, red and yellow, reasonably-drained, loamy soils of the Avalon, Hutton, Clovelly, Glencoe, and other soil forms that are good for crop production. The other half comprises other soils that have various limitations for crop production, which are predominantly the result of poor drainage or limited depth due to underlying clay or bedrock. These soils are of the Mispah and Glenrosa soil forms (shallow bedrock) and the Longlands, Valsrivier, Kroonstad, Mayo, Shortlands, and other soil forms (poor drainage and underlying clay).

***Figure 4.*** *View of typical site conditions with grazing lands left and croplands right.*

***Figure 5.*** *View of soils on site with depth limitations due to underlying rock.*

***Figure 6.*** *View of typical site conditions on grazing lands.*

### 8.2 Terrain and slope

The site is situated on elevated, slightly hilly terrain, with all aspects, at an altitude of between 1,620 and 1,760 metres and slopes up to about 10%. Turbines are generally located on the higher lying ridge lines, except where yield analysis and optimisation indicate a better suited position.

### 8.3 Available water sources

There is no significant irrigated crop production anywhere across the site (as per Figure 3 above) because water for irrigation is generally not available in the area.

### 8.4 Vegetation

Natural vegetation of the site is Eastern Highveld Grassland and Wakkerstroom Montane Grassland, which has been disturbed by agricultural and other anthropogenic activities.

### 8.5 Agro-climatic information

The site has a summer rainfall with a mean annual rainfall of between 722 and 754 mm and a mean annual evaporation of approximately 1,210 mm (Schulze, 2009).

### 8.6 Land use and development on and surrounding the site

The site is located in a grain and cattle farming agricultural region, but the soils vary in their suitability for crop production. Crops in the area include mainly maize and soya beans. Farmers generally utilise all suitable soil as cropland. Only soil that is not suitable for crop production is used for grazing of cattle and sheep. Limitations that render the soil unsuitable for crop production are poor drainage and depth limitations due to rock or dense clay in the subsoil.

Coal-fired electricity generation and mining take place in the surrounding area.

### 8.7 Agricultural potential and productivity

Because of the favourable climate and suitable soils on the croplands, crop yields are fairly high with average maize yields of around 7 to 8 tons per hectare according to the farmers on site. The long-term grazing capacity of the area is fairly high at 4.5 hectares per large stock unit (DAFF, 2018).

### 8.8 Agricultural employment

It is estimated, from surveyed landowners, that the agricultural enterprises of the directly affected farms employ approximately 35 people.

### 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. The Camden 1 WEF, including all its associated infrastructure and roads, will only excludes 0.8% of the total farmland from potential agricultural production. 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.

It is also important to note that renewable energy facilities have both positive and negative effects on the production potential of land (see Section 9.3) and so it is the net sum of these positive and negative effects that determines the extent of the change in future 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

There is ultimately only ever a single agricultural impact of a development and that is a change to the future agricultural production potential of the land. This impact occurs by way of different mechanisms some of which lead to a decrease in production potential and some of which lead to an increase. It is the net sum of positive and negative effects that determines the overall agricultural impact.

Two direct mechanisms 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 indirect mechanisms have been identified that lead to increased agricultural potential through:

1. **increased financial security for farming operations -** Reliable 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 two additional effects, 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 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. 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 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?

DFFE 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 considering all renewable energy project applications within a 30 km radius. According to the DFFE database, there are no other renewable energy projects within a 30 km radius of the Camden 1 site. There is however, the associated Camden 2 Wind Energy Facility. In quantifying the cumulative impact, the area of land taken out of agricultural use as a result of these projects (total generation capacity of up to 500 MW) will amount to a total of approximately 150 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 0.05% of the surface area. That is considered to be within an acceptable limit in terms of loss of agricultural land.

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. However it should be noted that any future coal mining on the site will have a significant and much greater agricultural impact than the proposed wind energy facility.

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.

In terms of the substation and BESS, both proposed alternatives are located entirely off cropland and there is therefore no difference in their agricultural impacts and no preferred alternative from an agricultural impact point of view.

## 9.7 Long term project benefits versus agricultural benefits

The development will generate a significant (at the scale of an individual farm), reliable, and predictable 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. In this development, access roads have mostly been laid out on existing roads and on the edges of croplands, so that croplands are not unnecessarily fragmented. However an assessment of the road layouts has identified several places in which the road layout could be improved and where the roads could be shifted to run on the edges of croplands rather than bisect them. The areas for improvement in this regard are identified in Figure 7.

### 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 agricultural 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.

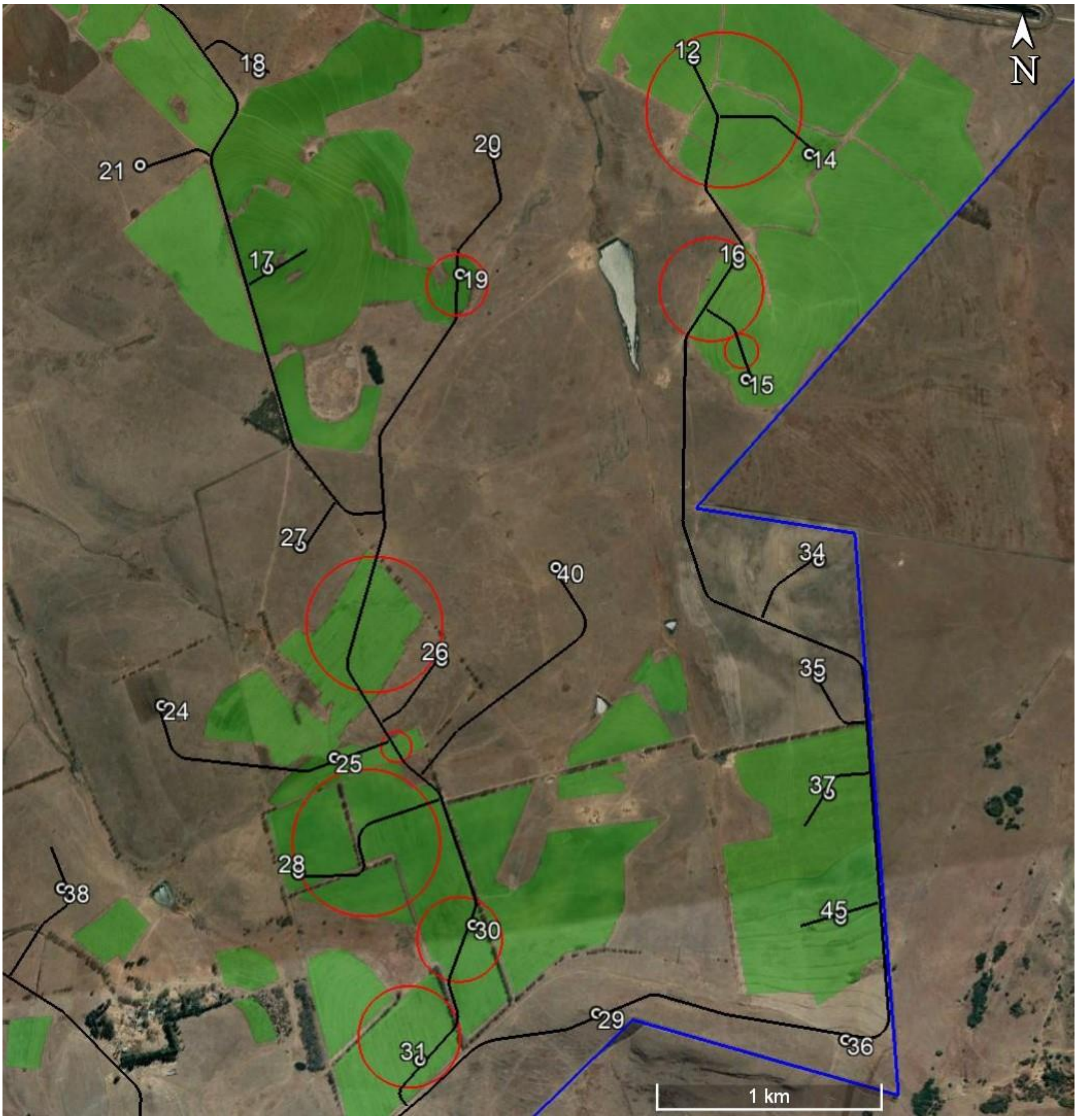


***Figure 7.*** *Map identifying all the roads (in red circles) that unnecessarily bisect cropland. All of these roads should be realigned to run on the edges of the cropland, where possible.*

**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 categories 2, 5 and 6. The calculation of the compliance of the proposed wind farm to the development limits, is detailed in Table 2. Wind farm infrastructure that take up the largest areas have been included in the table, so the majority of the wind farm footprint is represented. Small additions to the footprint from additional infrastructure that is not included here (for example the widening of existing roads) will not significantly increase the total hectares of the wind farm as it is given in the table.

**Table 2. Calculation of the extent to which the proposed up to 200 MW WEF footprint is within the allowable development limits of the site.**

| | | Category 2 | | Category 5 | | Category 6 | | |
|---|---|---|---|---|---|---|---|---|
| **Infrastructure** | **Unit size** | **Quantity** | **ha** | **Quantity** | **ha** | **Quantity** | **ha** | **Total hectares** |
| Crane pads | 0.5 | 22 | 11.00 | 21 | 10.50 | 2 | 1.00 | 22.50 |
| New roads | 6.0 | 5,622 | 3.37 | 13,908 | 8.34 | 0 | 0.00 | 11.72 |
| Substation | 8.0 | 0 | 0.00 | 1 | 8.00 | 0 | 0.00 | 8.00 |
| **Total footprint** | | | **14.37** | | **26.84** | | **1.00** | **42.22** |
| Allowable ha/MW | | | 0.20 | | 0.35 | | 2.50 | |
| **Sum of utilised MW** | | | **71.87** | | **76.70** | | **0.40** | **148.97** |

| | |
|---|---|
| Total project area (hectares) | 4,935 |
| **Footprint as % of area** | **0.86** |

***Note:*** *Table does not include wind farm access roads that will utilise existing roads or replace existing roads. It also presumes that the road change recommendations made in Section 9.9 have* *been implemented.*

The proposed facility has a generation capacity of up to 200 MW. The results of the calculation in Table 2 show that the facility footprint only utilises 149 MW of the 200 available and therefore confirms that the agricultural footprint of the proposed wind farm is within the allowable development limits set by the agricultural protocol.

The agricultural footprint is calculated as 42 hectares in Table 2. This means that the wind farm excludes only 42 hectares out of a total farmland of approximately 4,935 hectares, which is a mere 0.86% of the farmland. Even if some additional infrastructure, not included in Table 2, increases the footprint slightly, it will still be less than 1%. This is an insignificantly small amount of farmland.

### 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 in tact. 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 and statement

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 impacts in an environmental impact assessment is done according to a prescribed, semi-quantitative rating methodology that is supposed to cover all specialist disciplines and allow comparison of the impacts across them. However, the system was designed for biological components of the ecosystem such as plants and animals and does not rate agricultural impacts in a sensible or particularly useful way. As has been discussed above, the significance of the agricultural impact is simply the degree to which the future agricultural production potential of the site will be changed and that is predominantly a function of the size of the area of land that is impacted and the production potential of that impacted land. The dominant factor in this case is the insignificant size of the area of land that is impacted. The prescribed methodology complicates and obscures what is actually a simple and straight forward assessment. Nevertheless, the prescribed rating methodology is presented here for compliance purposes.

However, other aspects of agricultural impact, such as compliance with the prescribed allowable development limits, are much more important and relevant than the table below for determining the significance of the agricultural impact.

| | |
|---|---|
| ***Aspect:*** | Agricultural production potential |
| ***Description:*** | Decrease in agricultural production potential |
| ***Stage:*** | There is only one agricultural impact and it occurs for the duration of the project life time. To differentiate between the different phases of the project does not really make sense, but for compliance purposes the impact, as assessed below, can be considered to be identical across the construction, operation and decommissioning phases of the project. |
| ***Character:*** | Negative |
| ***Ease of mitigation:*** | High |

| | **Without mitigation** | **With mitigation** |
|---|---|---|
| ***Magnitude (M)*** | very low (1) | very low (1) |
| ***Extent (E)*** | site only (1) | site only (1) |
| ***Reversibility (R)*** | Reversible (1) | Reversible (1) |
| ***Duration (D)*** | Long term (4) | Long term (4) |
| ***Probability (P)*** | Low probability (2) | Low probability (2) |
| ***Significance (S)*** | N1 – Very low (14) | N1 – Very low (14) |

Mitigation measures against soil degradation are standard best practice for construction sites and renewable energy facilities, but will not change the significance rating as assessed above.

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 (0.86%) from agricultural production. The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable 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.

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.

## 10 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 (0.86%) from agricultural production. The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable 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.

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

## 11 REFERENCES


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Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data layer, 2017. Pretoria.

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

Lanz, J. 2018. The impact of wind farms on agricultural resources and production: a case study from the Humansdorp area, Eastern Cape. Unpublished Report.

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Soil Classification Working Group. 1991. Soil classification: a taxonomic system for South Africa. Soil and Irrigation Research Institute, Department of Agricultural Development, Pretoria.

**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 CAMDEN 2 WIND ENERGY FACILITY NEAR ERMELO 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<br>**Physical address:** Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia<br><br>Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:<br>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<br>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:

19 July 2022

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

19 July 2022

Date

Signature of the Commissioner of Oaths

2022-07-19

Date

SOUTH AFRICAN POLICE SERVICE
STATION COMMANDER
WYNBERG
2022 -07- 1 9
STASIEBEVELVOEDER
WYNBERG
SOUTH AFRICAN POLICE SERVICE

**APPENDIX 3: MAP OF PROJECTS CONSIDERED FOR CUMULATIVE IMPACT**

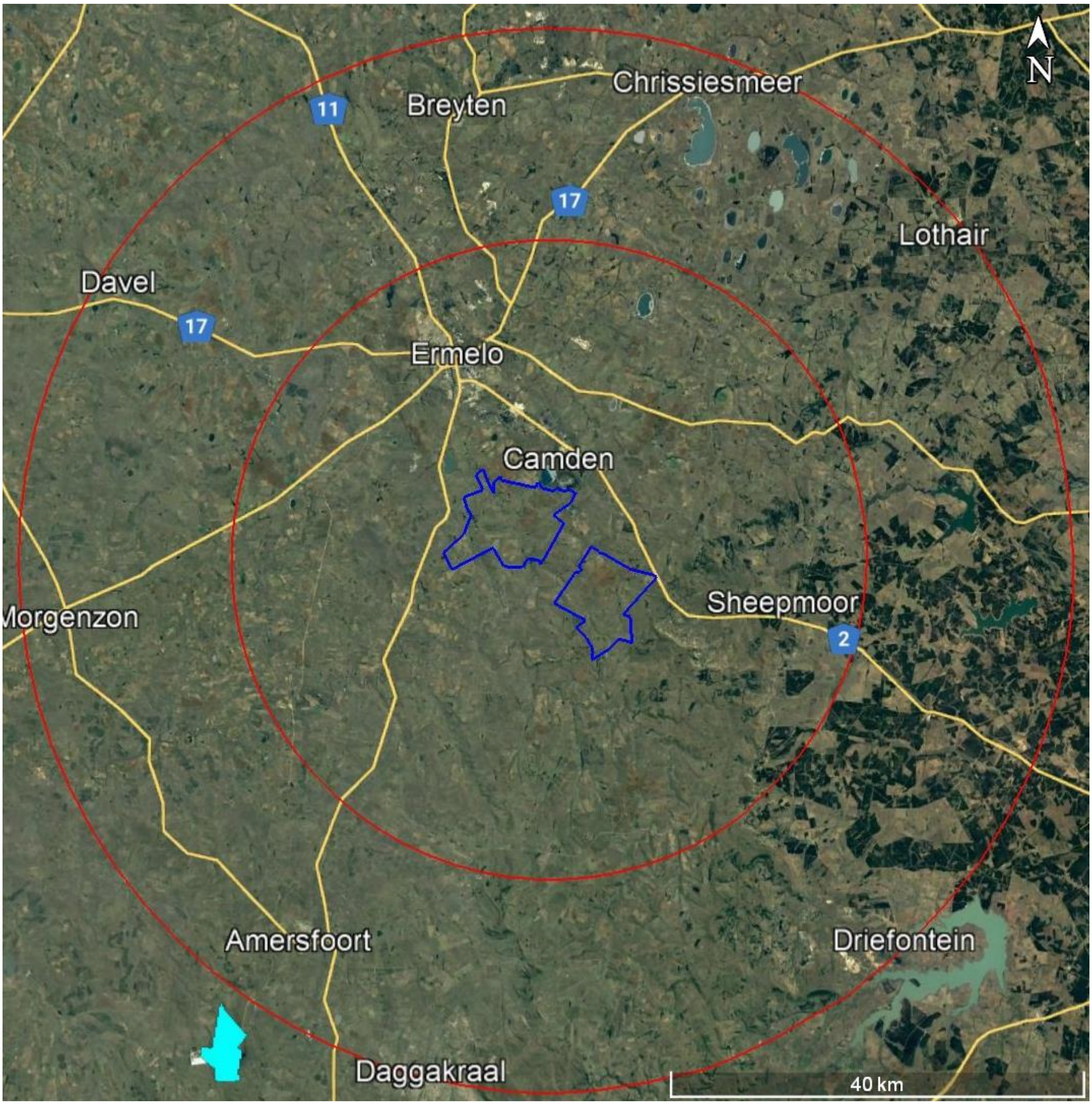


***Figure 8.*** *30 km and 50 km radius around the Camden 2 site. Only one other renewable energy facility, the associated Camden 1 WEF, immediately north-west of Camden 2, is within 50 km of the site.*

**APPENDIX 4: SOIL DATA OF LAND TYPE**

| Land type | Soil series (forms) | Depth (mm) | Clay % A horizon | Clay % B horizon | Depth limiting layer | % of land type |
|---|---|---|---|---|---|---|
| Ba51 | Hu | 900 - 1200 | 20 - 30 | 25 - 40 | so,hp | 26,8 |
| Ba51 | Ms / Gs | 300 - 450 | 15 - 30 | | R,lc | 16,5 |
| Ba51 | Av | 900 > 1200 | 20 - 30 | 25 - 40 | sp | 13,3 |
| Ba51 | Lo | 900 > 1200 | 15 - 30 | 35 - 45 | sp | 8,8 |
| Ba51 | Gf | > 1200 | 20 - 30 | 25 - 40 | | 6,0 |
| Ba51 | Sw / Va | 350 - 500 | 30 - 40 | 35 - 55 | vp | 6,0 |
| Ba51 | Sd | 900 > 1200 | 30 - 35 | 30 - 45 | so | 5,8 |
| Ba51 | Kd | 750 - 1200 | 15 - 30 | 40 - 50 | gc | 5,0 |
| Ba51 | Gc | 800 - 1200 | 15 - 30 | 20 - 35 | hp | 4,5 |
| Ba51 | Bo | > 1200 | 35 - 45 | 35 - 50 | | 3,0 |
| Ba51 | Ka / Wo | 350 - 600 | 25 - 40 | | gc | 2,0 |
| Ba51 | S | | | | | 1,5 |
| Ba51 | Du | > 1200 | 10 - 25 | | | 1,0 |
| Ac39 | Hu | 450 - 1200 | 20 - 35 | 30 - 45 | so,hp | 36.8 |
| Ac39 | My | 300 - 450 | 30 - 45 | | lc | 7.8 |
| Ac39 | R | | | | | 7.5 |
| Ac39 | Ms | 200 - 450 | 15 - 25 | | R | 7.4 |
| Ac39 | Sd | 400 - 800 | 30 - 45 | 35 - 60 | so | 7.4 |
| Ac39 | Cv | 500 - 1200 | 20 - 35 | 25 - 45 | so | 7.3 |
| Ac39 | Gc | 500 - 1200 | 20 - 30 | 25 - 35 | hp | 4.9 |
| Ac39 | Gs | 300 - 450 | 15 - 25 | | lc | 4.9 |
| Ac39 | Bo | > 1200 | 30 - 50 | 35 - 60 | | 3.0 |
| Ac39 | Sw / Va | 200 - 450 | 30 - 40 | 40 - 55 | vp | 2.8 |
| Ac39 | Mw | 300 - 450 | 30 - 45 | | R | 2.7 |
| Ac39 | Lo | 450 - 900 | 15 - 25 | 30 - 40 | sp | 2.6 |
| Ac39 | Ms | 200 - 450 | 15 - 25 | | hp | 2.5 |
| Ac39 | Gf | > 1200 | 30 - 45 | 35 - 60 | | 2.4 |