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**AGRICULTURAL AGRO-ECOSYSTEM SPECIALIST ASSESSMENT
FOR
THE CARISSA WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE
NEAR BEAUFORT WEST, WESTERN CAPE PROVINCE**

**Report by
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16 October 2024

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EXECUTIVE SUMMARY

The overall conclusion of this assessment is that the proposed development is desirable from an agricultural perspective because it offers a valuable, win-win opportunity for a renewable energy facility to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of agricultural land with no loss of future agricultural production potential.

The screening tool classifies the assessed area as ranging from low to high agricultural sensitivity. This assessment disputes some of the detail of the sensitivity classification by the screening tool. It confirms the high sensitivity rating as a result of cropping status, but only for small, isolated patches of cropland that will be avoided by the development infrastructure, anyway. It disputes a classified land capability of >6 and rates the entire assessed area as having a maximum land capability of 6.

The climate is classified as arid with a mean annual rainfall of 157 mm. Climate is therefore the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation. Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has very low agricultural potential and its agricultural use is limited to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of a development. In the case of wind farms, the amount of land excluded from agriculture 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, and regardless of the duration of the impact. Furthermore, wind farms have both positive and negative effects on the production potential of land, and it is the net sum of these positive and negative effects that determines the extent of the change in future production potential. The positive effects include increased financial security for farming operations; improved security; and an improved road network.

Due to the fact that the proposed development will exclude agricultural production from only an insignificantly small area of land and that its negative impact is offset by economic and other benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

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

1 INTRODUCTION

Environmental and change of land use authorisation is being sought for the Carissa Wind Energy Facility and associated infrastructure near Beaufort West, Western Cape 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, because the assessed area includes high agricultural sensitivity land (see Section 7), the level of agricultural assessment required by the protocol is an Agricultural Agro-Ecosystem Specialist Assessment.

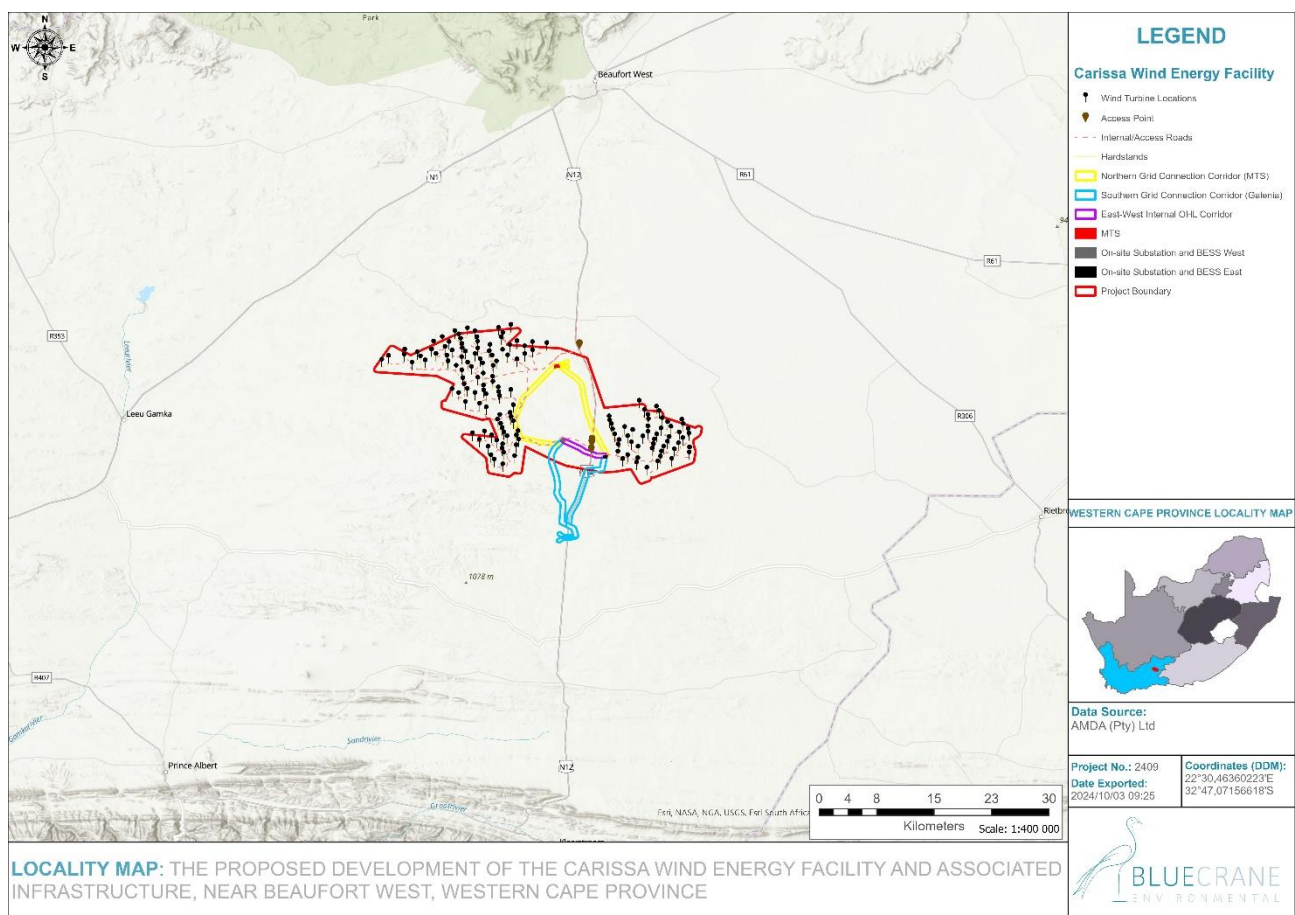


Figure 1. Locality map of the proposed energy facility south of the town of Beaufort West.

General Site and Location Information

| | |
|---------------------------------------|---|
| Description of affected farm portions | <p><u>Wind Energy Facility:</u></p> <ul style="list-style-type: none"> • Portion 6 of Farm Dale Ajalon No. 322 • Farm Meyers Poort No. 326 • Portion 3 (Portion of Portion 2) of Farm Vlakfontein No. 325 • Remaining Extent of Farm Palmietfontein No. 370 • Remainder Portion 1 of Farm Palmietfontein No. 370 • Portion 2 of Farm Palmietfontein No. 370 • Portion 3 of Farm Palmietfontein No. 370 • Portion 4 of Farm Palmietfontein No. 370 • Portion 3 of Farm Jagers Kraal No. 327 • Portion 6 of Farm Jagers Kraal No. 327 • Remaining Extent of Farm Vetkoe Kraal No. 369 • Portion 2 of Farm Vetkoe Kraal No. 369 • Portion 3 of Farm Vetkoe Kraal No. 369 • Portion 1 of Farm Brits Eigendom No. 374 • Portion 2 of Farm Brits Eigendom No. 374 • Portion 8 of Farm Brits Eigendom No. 374 • Portion 12 of Farm Brits Eigendom No. 374 • Portion 14 of Farm Brits Eigendom No. 374 • Portion 16 of Farm Brits Eigendom No. 374 • Portion 19 of Farm Brits Eigendom No. 374 • Portion 20 of Farm Brits Eigendom No. 374 • Remaining Extent of Farm No. 380 • Portion 6 of Farm No. 380 <p><u>Southern Grid Connection Corridor (Technically Preferred – Alternative 1):</u></p> <ul style="list-style-type: none"> • Portion 2 of Farm Palmietfontein No. 370 • Portion 19 of Farm Brits Eigendom No. 374 • Portion 2 of Farm Brits Eigendom No. 374 • Portion 4 of Farm No. 380 • Remaining Extent of Portion 11 of Farm Brits Eigendom No. 374 • Portion 10 of Farm Brits Eigendom No. 374 • Portion 24 of Farm Brits Eigendom No. 374 • Portion 25 of Farm Brits Eigendom No. 374 • Portion 1 of Farm Trakas Kuilen No. 15 <p><u>Northern Grid Connection Corridor (Alternative 2):</u></p> <ul style="list-style-type: none"> • Remaining Extent of Farm Palmietfontein No. 370 • Portion 2 of Farm Palmietfontein No. 370 |
|---------------------------------------|---|

| | |
|--|---|
| | <ul style="list-style-type: none"> • Portion 3 of Farm Jagers Kraal No. 327 • Portion 6 of Farm Jagers Kraal No. 327 • Portion 19 of Farm Brits Eigendom No. 374 • Portion 2 of Farm Brits Eigendom No. 374 • Portion 2 of Farm Vetkoe Kraal No. 369 • Remaining Extent of Farm Vetkoe Kraal No. 369 <p><u>Access Road 1 (existing unnamed gravel road off of the N12):</u></p> <ul style="list-style-type: none"> • Portion 3 of Farm No. 328 <p><u>Access Road 2 (new access point off of the N12):</u></p> <ul style="list-style-type: none"> • Portion 2 of Farm Brits Eigendom No. 374 <p><u>Access Road 3 (existing unnamed gravel road off of the N12):</u></p> <ul style="list-style-type: none"> • Portion 2 of Farm Brits Eigendom No. 374 <p><u>Access Road 4 (new access point off of the N12):</u></p> <ul style="list-style-type: none"> • Portion 2 of Farm Brits Eigendom No. 374 |
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The

purpose of an agricultural assessment is to answer the question:

Will the proposed development cause a significant reduction in future agricultural production potential, and most importantly, will it result in a loss of arable land?

Section 9 of this report unpacks this question, particularly with respect to what constitutes a significant reduction. To answer the above question, it is necessary to determine the existing agricultural production potential of the land that will be impacted, and specifically whether it is viable arable land or not. This is done in Section 8 of this report. Sections 8 and 9 of this report directly address the above question and therefore contain the essence and most important part of the agricultural impact assessment.

2 PROJECT DESCRIPTION

The proposed Carissa WEF will comprise of 154 wind turbines and associated infrastructure and will have a contracted capacity of up to 1 000 MW.

The proposed Carissa WEF will cover up to 41 699ha and will include the following infrastructure:

- Up to 154 wind turbines (including turbine hardstand areas);
- Two on-site facility substations and Eskom switching stations (up to 132 kV);
- Power lines (underground and overhead);
- An on-site 400 kV / 132 kV Main Transmission Substation (MTS);
- Two grid connection corridor alternatives to connect the on-site facility

substations/switching stations to the proposed MTS (on-site or off-site Eskom Galenia MTS);

- Up to 132 kV double circuit overhead power lines to connect the facility to the proposed MTS (on-site or off-site Eskom Galenia MTS);
- Up to 132 kV internal overhead power line to connect the two (02) facility substations/switching stations (east-west substations/switching stations);
- Up to 400 kV LILO connection to connect/tie the proposed MTS (on-site or off-site) into the existing 400 kV overhead power lines;
- Auxiliary buildings;
- Construction Site Camps;
- Battery Energy Storage Systems (BESS);
- Temporary and permanent laydown areas;
- Batching plant; and
- Internal and perimeter access roads.

What is relevant for agricultural impact in a wind energy facility layout is the small but widely distributed footprint of land on which agriculture is actually excluded. The largest components of this footprint are the crane pads and the roads. All components have the same impact, namely occupation of agricultural land. The agricultural footprint of the facility is shown in Figure 2 and 3.

3 TERMS OF REFERENCE

The terms of reference for this study are 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 terms of reference for an Agricultural Agro-Ecosystem Specialist Assessment, as stipulated in the protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets.

1. The assessment must be undertaken by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP). **(Appendix 3)**
2. The assessment must be undertaken on the preferred site and within the proposed development footprint. **(Figures 2 and 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:
 - a. the extent of the impact of the proposed development on the agricultural resources (**Section 9.1**);
 - b. whether or not the proposed development will have an unacceptable negative impact on the agricultural production capability of the site (**Section 12**), and in the event where it does, whether such a negative impact is outweighed by the positive impact of the proposed development on agricultural resources.
4. The status quo of the site must be described, including the following aspects which must be considered as a minimum in the baseline description of the agro-ecosystem:
 - a. The soil form/s, soil depth (effective and total soil depth), top and sub-soil clay percentage, terrain unit and slope (**Section 8**);
 - b. Where applicable, the vegetation composition, available water sources as well as agro-climatic information (**Section 8**);
 - c. The current productivity of the land based on production figures for all agricultural activities undertaken on the land for the past 5 years, expressed as an annual figure and broken down into production units (**Section 8**);
 - d. The current employment figures (both permanent and casual) for the land for the past 3 years, expressed as an annual figure (**Section 8**);
 - e. Existing impacts on the site, located on a map where relevant (e.g. erosion, alien vegetation, non-agricultural infrastructure, waste, etc **Section 8**).
5. Assessment of Impacts, including the following which must be considered as a minimum in the predicted impact of the proposed development on the agro-ecosystem:
 - a. Change in productivity for all agricultural activities based on the figures of the past 5 years, expressed as an annual figure and broken down into production units (**Section 9.1**);
 - b. Change in employment figures (both permanent and casual) for the past 5 years expressed as an annual figure (**Section 9.1**);
 - c. Any alternative development footprints within the preferred site which would be of “medium” or “low” sensitivity for agricultural resources as identified by the screening tool and verified through the site sensitivity verification (**Section 9.3**).
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:

- a. 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**);
- b. A signed statement of independence by the specialist (**Appendix 2**);
- c. The duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment (**Section 4**);
- d. A description of the methodology used to undertake the on-site assessment inclusive of the equipment and models used, as relevant (**Section 4**);
- e. 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**);
- f. 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 9.1**);
- g. 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 11.4**);
- h. Additional environmental impacts expected from the proposed development based on the current status quo of the land including erosion, alien vegetation, waste, etc. (**Section 11.5**);
- i. Information on the current agricultural activities being undertaken on adjacent land parcels (**Section 8**);
- j. 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 (**Section 9.3**);
- k. 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 11.1**);
- l. 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 12**);
- m. Any conditions to which this statement is subjected (**Section 12**);
- n. Where identified, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr) (**Section 10**);

- o. A description of the assumptions made and any uncertainties or gaps in knowledge or data (**Section 5**).
- p. 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 11.3**);
- q. 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 11.3**):
 - a. where relevant, reasons why the proposed development footprint is required to exceed the limit; (not applicable)
 - b. where relevant, reasons why this exceedance will be in the national interest; (not applicable) and
 - c. where relevant, reasons why there are no alternative options available including evidence of alternatives considered; (not applicable) and
- 7. a map showing the renewable energy facilities within a 30km radius of the proposed development (**Appendix 4**)

4 METHODOLOGY OF STUDY

The assessment was based on an on-site investigation conducted between 18 and 20 April 2024. It was also informed by existing climate, soil, and agricultural potential data for the site (see references). The aim of the on-site assessment was to:

- Verify current cropping status and agricultural land use across the site;
- Assess agricultural conditions across the site.

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 date on which this assessment was done has no bearing on its results. The level of agricultural assessment is considered entirely adequate for an understanding of on-site agricultural production potential for the purposes of this assessment.

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

This section identifies all applicable agricultural legislation and permit requirements over and above what is required in terms of NEMA.

The development requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) because it is on agriculturally zoned land. This approval is separate to the Environmental Authorisation. There are two approvals that apply. The first is a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. This application requires a motivation backed by good evidence that the development is acceptable in terms of its impact on the agricultural production potential of the development site. This agricultural assessment report will serve that purpose.

The second approval is a consent for long-term lease required in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). SALA approval is not required if the lease is over the entire farm portion. If DALRRD approval for the development has already been obtained in the form of the No Objection letter, then SALA approval is likely to be readily forthcoming. SALA approval can only be applied for once the Municipal Rezoning Certificate and Environmental Authorisation has been obtained.

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 construction of 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.

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

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

If one or both conditions apply, then no agricultural consent is required. The second condition is

likely to apply, even if another entity gets Environmental Authorisation for and constructs the power line, but then hands it over to Eskom for its operation. Eskom is currently exempt from agricultural consent for power line servitudes.

7 SITE SENSITIVITY VERIFICATION

A specialist agricultural assessment is required to include a verification of the agricultural sensitivity of the development site as per the sensitivity categories used by the web-based environmental screening tool of the Department of Forestry, Fisheries and the Environment (DFFE). Agricultural sensitivity is an indication of the capability of the land for agricultural production, based only on its climate, terrain, and soil capabilities and its agricultural land use. The different categories of agricultural sensitivity indicate the priority by which land should be conserved as agricultural production land. However, the screening tool's agricultural sensitivity is often of very limited value for assessing agricultural impact. What is of importance to an agricultural assessment, rather than the site sensitivity verification, is its assessment of the cropping potential and its assessment of the impact significance, both of which are not necessarily correlated with sensitivity.

The screening tool classifies agricultural sensitivity according to two independent criteria, from two independent data sets, both of which may be indicators of the land's agricultural production potential but are limited in that the first is outdated and the second is fairly coarse, modelled data. The two criteria are:

1. whether the land is classified as cropland or not on the field crop boundary data set (Crop Estimates Consortium, 2019), and
2. its land capability rating on the land capability data set (DAFF, 2017)

All classified cropland is, by definition, either high or very high sensitivity. Land capability is defined as the combination of soil, climate, and terrain suitability factors for supporting rain-fed agricultural production. It is rated by the Department of Agriculture's updated and refined, country-wide land capability mapping (DAFF, 2017). The higher land capability values (≥ 8 to 15) are likely to indicate suitability as arable land for crop production, while lower values (< 8) are likely to only be suitable as non-arable grazing land, although application to the winter rainfall areas differs. The direct relationship between land capability rating, agricultural sensitivity, and rain-fed cropping suitability is shown in Table 1, including differences between the summer and winter rainfall areas.

Table 1: Relationship between land capability, agricultural sensitivity, and rain-fed cropping suitability.

| Land capability value | Agricultural sensitivity | Rain-fed cropping suitability | |
|-----------------------|--------------------------|-------------------------------|-----------------------|
| | | Summer rainfall areas | Winter rainfall areas |
| 1 - 5 | Low | Unsuitable | Unsuitable |

| | | | |
|---------|-----------|--|----------|
| 6 | Medium | | Suitable |
| 7 | | | |
| 8 - 10 | High | | |
| 11 - 15 | Very High | | |

Note: There is an error in the screening tool whereby a land capability of 8 is classified as medium sensitivity, but according to NEMA's agricultural protocol, should in fact be classified as high sensitivity. This assessment follows the agricultural protocol definition and classifies a value of 8 as high sensitivity.

The agricultural sensitivity of the site, as classified by the screening tool, is shown in Figure 2. The screening tool sensitivity requires specialist verification because of the limitations of the data sets on which it is based.

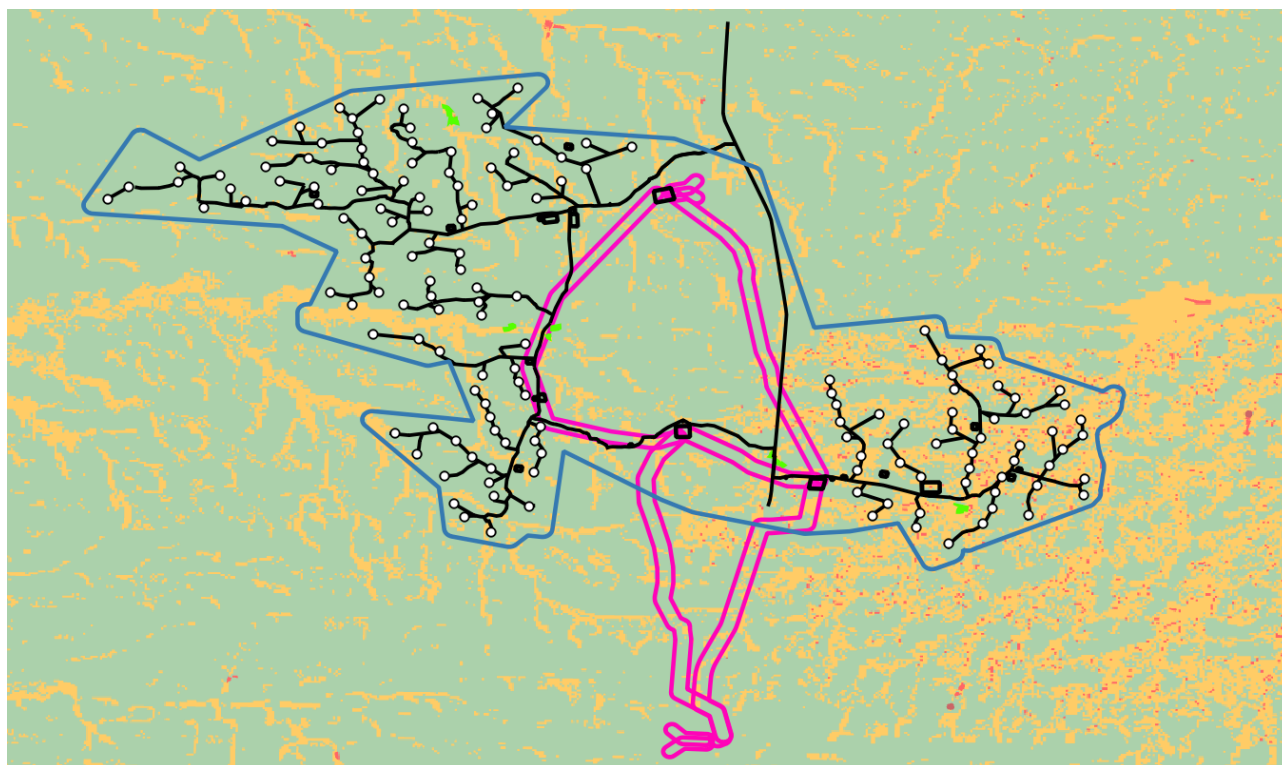


Figure 2. The assessed infrastructure overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). All confirmed areas of high sensitivity (croplands) are shown in green outline. All areas outside of these are rated as low to medium sensitivity.

This verification of sensitivity addresses both components that determine it, namely cropping status (that is whether the land is currently or has recently been used for crop production) and land capability. The screening tool classifies the assessed area as ranging from low to high agricultural sensitivity. The high sensitivity classification is due to a combination of some land being classified as

cropland and some being classified as high sensitivity because of its land capability rating. However, the data set used by the screening tool to classify cropland is outdated. This assessment has verified all current areas of viable cropland, which differ from those classified as cropland by the screening tool. The verified areas of viable cropland are shown in Figures 2 and 3. This assessment therefore confirms the high sensitivity rating by the screening tool that is based on the cropping status component of sensitivity, only for those areas that have been verified as cropland. It should be noted that croplands in this environment are restricted to small, isolated patches that are usually associated with farmsteads and located close to watercourses. None of the croplands on site will be impacted by any of the development infrastructure.

The classified land capability of the site ranges from 4 to 9. The high sensitivity classification resulting from the land capability component of sensitivity is due to some land being classified with a land capability of 8 and 9. Note that a value of 8 is defined as high agricultural sensitivity in NEMA's agricultural protocol but does not show as high on the screening tool's output due to an error in the tool. In this assessment all areas of value 8 are treated as being classified by the screening tool as high sensitivity. This assessment disputes a classified land capability of >6 , based on an assessment that the site is unsuitable for viable rain-fed crop production. The appropriate land capability of land that is unsuitable for viable rain-fed crop production is ≤ 6 because the relationship between land capability and agricultural production potential is such that a land capability of >6 should denote land that is suitable for viable rain-fed crop production. This assessment therefore rates the entire proposed footprint as having a maximum land capability of 6 and therefore as being of medium agricultural sensitivity in terms of the land capability component of sensitivity.

In conclusion, this assessment disputes some of the detail of the sensitivity classification by the screening tool. It confirms the high sensitivity rating as a result of cropping status, but only for small, isolated patches of cropland that will be avoided by the development infrastructure, anyway. It disputes a classified land capability of >6 and rates the entire assessed area as having a maximum land capability of 6.

The screening tool sensitivity of a power line corridor has very little relevance to the assessment of its agricultural impact because the impact is likely to be negligible (see Section 9), regardless of the agricultural sensitivity of the land which it crosses.

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The purpose of this section is firstly to present the baseline information that controls the agricultural production potential of the site and then to assess that potential. Agricultural production potential, and particularly cropping potential, is one of three factors that determines the significance of an agricultural impact, together with size of footprint and duration of impact.

The climate is classified as arid (Beck et al, 2018) with a mean annual rainfall of 157 mm and evaporation of 1474 mm (Schulze, 2009). Climate is therefore the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation (DAFF, 2002). Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has very low agricultural potential and its agricultural use is limited to grazing only.

The land has a long-term grazing capacity of 36 hectares per large stock unit (DAFF, 2018). Because climate is the limiting factor that controls production potential, it is the only aspect of the agro-ecosystem description that is required for assessing the agricultural impact of this development. All other agricultural potential parameters become irrelevant under the dominant limitation of aridity.

Table 2: Parameters that control and/or describe the agricultural production potential of the site.

| | Parameter | Value |
|---------|--|--|
| Climate | Köppen-Geiger climate description (Beck <i>et al</i> , 2018) | Arid, desert, cold |
| | Mean Annual Rainfall (mm) (Schulze, 2009) | 157 |
| | Reference Crop Evaporation Annual Total (mm) (Schulze, 2009) | 1474 |
| | Climate capability classification (out of 9) (DAFF, 2017) | 4 (low-moderate) |
| Terrain | Terrain type | Karoo |
| | Terrain morphological unit | Varied |
| | Slope gradients (%) | 0 to 50 |
| | Altitude (m) | 950 |
| | Terrain capability classification (out of 9) (DAFF, 2017) | 3 (low) to 7 (high) |
| Soil | Geology (DAFF, 2002) | Quaternary alluvium overlying Mudstone, siltstone and sandstone of the Beaufort Group; Karoo Sequence. |
| | Land type (DAFF, 2002) | Fc160, Fc162, Fc164, Fc183 |
| | Description of the soils | Vaired soils but dominated by shallow, rocky soils on underlying bedrock. |
| | Dominant soil forms | Mispah, Glenrosa, Rock outcrops, Hutton, Oakleaf, Dundee |
| | Soil capability classification (out of 9) (DAFF, 2017) | 2 (low-very low) to 6 (moderate-high) |

| | Parameter | Value |
|----------|---|---------------------------------------|
| | Soil limitations | Limited soil depth |
| Land use | Agricultural land use in the surrounding area | Grazing |
| | Agricultural land use on the site | Grazing, Olives, Planted Pastures |
| General | Long-term grazing capacity (ha/LSU) (DAFF, 2018) | 36 |
| | Land capability classification (out of 15) (DAFF, 2017) | 4 (low-very low) to 9 (moderate-high) |
| | Within Protected Agricultural Area (DALRRD, 2020) | No |
| | Within Renewable Energy Development Zone (REDZ) | Yes |

The agricultural protocol requires the current productivity of the land based on detailed production figures and it requires the current employment figures. This detail is entirely irrelevant to the assessment of the agricultural impact, given that the expected losses in production and employment will be zero. It is therefore unnecessary to include this detail.

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

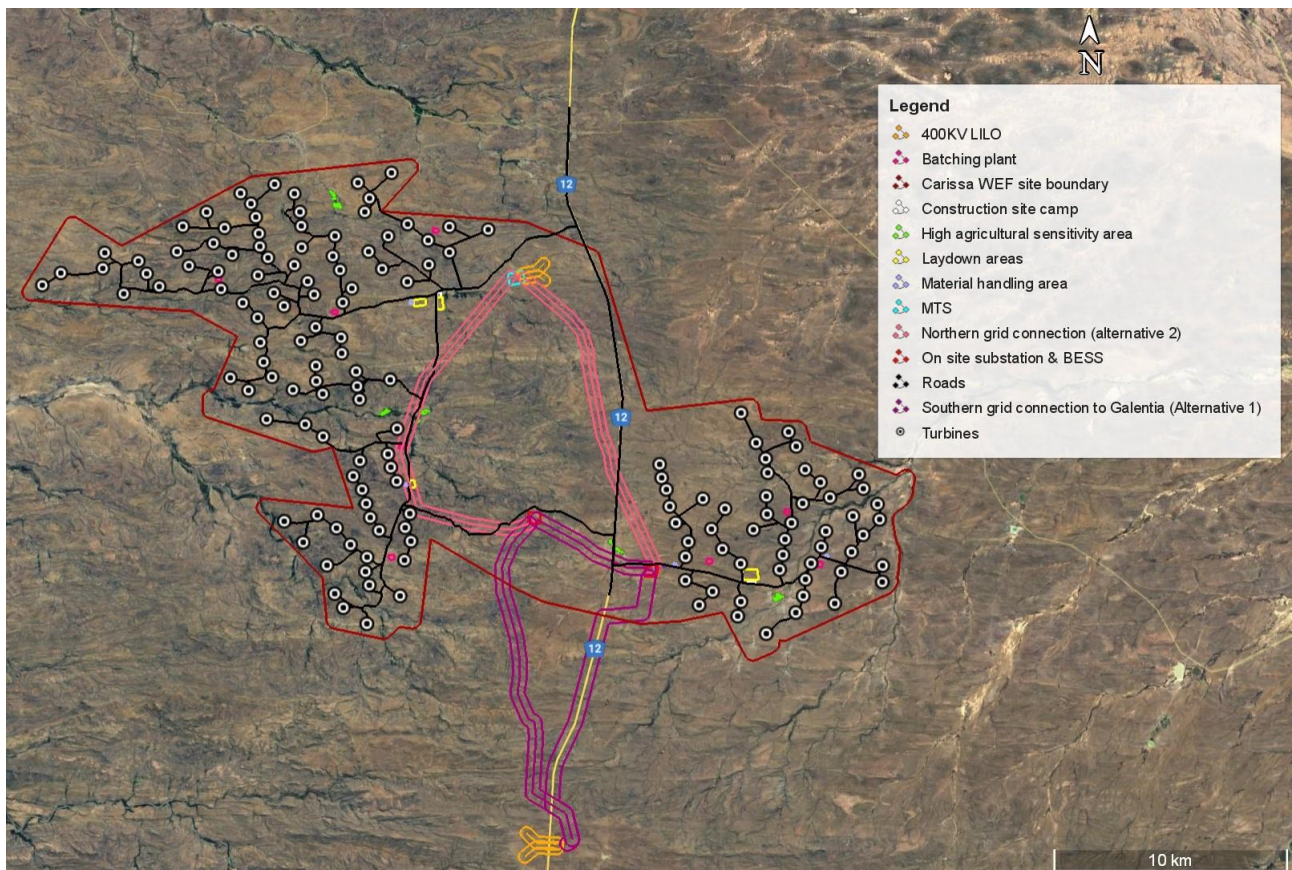


Figure 3. Satellite image map of the development.



Figure 4. Typical site conditions.



Figure 5. *Typical site conditions.*

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 Impact identification and assessment

There is only ever a single agricultural impact of any development, and it is a net change to the future agricultural production potential of land. It occurs as a result of different mechanisms, some of which decrease production potential and some of which increase it. In most developments, the decrease in production potential is primarily caused by the exclusion of agriculture from the footprint of the development. Soil erosion and degradation may also contribute to loss of agricultural production potential, but these can be managed so as not to cause impact. The significance of a loss of agricultural production potential is a direct function of the following three factors:

1. the size of the footprint of land from which agriculture will be excluded (or the footprint that will have its potential decreased)
2. the baseline production potential (particularly cropping potential) of that land
3. the length of time for which agriculture will be excluded (or for which potential will be decreased).

In the case of wind farms, the first factor, size of footprint, 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 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. During construction there is some disturbance to agricultural activities. Thereafter, all agricultural activities can continue unaffectedly on all parts of the farmland other than this small footprint, from which agriculture is excluded, and the actual loss of production potential is therefore insignificant.

Furthermore, the entire area impacted by the windfarm is not viable for cropping and is therefore below the threshold of needing to be conserved as agricultural production land.

At the farm level, the development will provide a positive economic impact because the lease of the land to the energy facility will generate additional income without compromising agricultural production. This is likely to increase cash flow and financial security and may improve farming operations and productivity through increased investment into farming.

Due to the fact that the proposed development will not occupy scarce, viable cropland, and that its negative impact is offset by economic and other benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

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.

The proposed overhead power line has negligible agricultural impact, regardless of the agricultural potential and sensitivity of the land it crosses. The agricultural impact of a power line is negligible in almost all environments but is even more so where agricultural land use is predominantly grazing, which it is in the environment that is the subject of this assessment. All possible agricultural activities can continue entirely unhindered underneath the power line. The direct, permanent, physical footprint that has any potential to interfere with agriculture is confined to pylon bases and a servitude track and is therefore insignificantly small. The only potential source of impact of the power line is minimal disturbance to the land (erosion and topsoil loss) during construction (and

decommissioning). This impact can be completely prevented with standard, generic mitigation measures that are all inherent in the project engineering and/or are standard, best-practice for construction sites, and are included in the generic EMP_r developed by DFFE. The power line will result in negligible loss of future agricultural production potential and its agricultural impact is therefore assessed as being of very low significance and as acceptable.

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. Aspects of the prescribed methodology, such as probability, do not make sense and tend to skew the calculation of significance. Other aspects of agricultural impact, such as compliance with the prescribed allowable development limits, are much more important and relevant for determining the significance of the agricultural impact.

9.2 Cumulative impact assessment

Specialist assessments for environmental authorisation are required to assess 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?

The Department of Forestry, Fisheries and the Environment (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.

This cumulative impact assessment determines the quantitative loss of agricultural land if all renewable energy project applications within a 30 km radius become operational. These projects are listed in Appendix 4 of this report. Note that electrical grid infrastructure projects do not contribute to a loss of agricultural land and are not therefore included in this calculation of cumulative land loss. The area of land taken out of agricultural use as a result of all the projects listed in Appendix 4 (total generation capacity of 4228 MW) will amount to a total of approximately 2839 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 30 km radius (approximately 282,700 ha), this amounts to only 1% of the surface area. This is well within an acceptable limit in terms of loss of agricultural land, much of which is only suitable for grazing.

All the projects contributing to cumulative impact for this assessment have the same agricultural impacts in a very similar agricultural environment, and therefore the same mitigation measures apply to all.

Specialist assessments for environmental authorisation are required, if the associated grid infrastructure is being applied for separately, to include it as part of the cumulative assessment for the facility. However, due to their negligible agricultural impact, power lines do not contribute to the cumulative impact of the facility. Given the small footprint of the substations, their contribution will also not be significant. Inclusion of the impact of the grid connection of the facility does not therefore change the significance of the cumulative impact of the facility.

The loss of agricultural potential by soil degradation can effectively be prevented for renewable energy developments by generic mitigation measures that are all inherent in the project engineering and/or are standard, best-practice for construction sites. Soil degradation does not therefore pose a cumulative impact risk.

Due to all the considerations discussed above, the cumulative impact of loss of future agricultural production potential is assessed as low. It will not have an unacceptable negative impact on the agricultural production capability of the area, and it is therefore recommended, from a cumulative agricultural impact perspective, that the development be approved.

9.3 Assessment of alternatives

Specialist assessments for environmental authorisation are required to include a comparative impact assessment of alternatives, including the no-go alternative. Because of the insignificant agricultural impact of the power line, there can be no material difference between the agricultural impacts of any route alternatives. All have insignificant agricultural impact and are considered equally acceptable in terms of agricultural impact. Because of the uniformly low agricultural potential of the site, the exact positions of all wind farm infrastructure within it will make absolutely no difference to agricultural impacts, as long as croplands are avoided. Any alternative layouts that do not impact croplands will have equal agricultural impact and are assessed as equally acceptable.

All design and technology alternatives, including the choice of Lithium-ion or redox flow for the BESS, will also have no bearing on the significance of agricultural impacts. All will have equal impact and are assessed as equally acceptable.

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

The development compliments agriculture by providing an additional income source, without excluding agriculture from the land, or decreasing production. 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.

10 MITIGATION

10.1 Mitigation measures

The most important and effective mitigation of agricultural impacts for any development is avoidance of viable, potential cropland. This development has already applied this mitigation by

locating the facility where it avoids all viable, potential cropland in the area.

There are no additional mitigation measures required, over and above what has already been included in the *Generic Environmental Management Programme (EMPr) For The Development And Expansion For Overhead Electricity Transmission And Distribution Infrastructure* and the *Generic Environmental Management Programme (EMPr) For Substation Infrastructure For The Transmission And Distribution Of Electricity*, as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019.

Generic mitigation measures that are effective in preventing soil degradation are all inherent in the engineering of such a project and/or are standard, best-practice for construction sites. These include:

- A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering design on site. 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 done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 20 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. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface.

10.2 Inputs to the Environmental Management Programme

The inputs to the EMPr are detailed in the tables below for each development phase.

Table 1: Management plan for the planning and design phase

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|--------------------------------------|---|--|--|-----------------------------------|------------------|
| | | | Methodology | Frequency | Responsibility |
| Aspect: Protection of soil resources | | | | | |
| Erosion | That disturbance and existence of hard surfaces causes no erosion on or downstream of the site. | Design an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation 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 2: Management plan for the construction phase

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|--------------------------------------|---|--|--|--|-------------------------------------|
| | | | Methodology | Frequency | Responsibility |
| Aspect: Protection of soil resources | | | | | |
| Erosion | That disturbance and existence of hard surfaces causes no erosion on or downstream of the site. | Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. | Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. Photo evidence required. | Monthly during construction phase | Environmental Control Officer (ECO) |
| Erosion | That vegetation clearing does not pose a high erosion risk. | Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. | Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation. Photo evidence required. | Every 4 months during the construction phase | ECO |

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|--------------|---|---|---|--|----------------|
| | | | Methodology | Frequency | Responsibility |
| | | | | | |
| 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. Photo evidence required. | As required, whenever areas are disturbed. | ECO |

Table 3: 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 | The existence of hard surfaces causes no erosion on or downstream of the site. | Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring. | Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on | Once per month during the dry season and after any rain events during the dry season. Weekly during the | Facility Environmental Manager / onsite ECO |

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|---------|---|---|--|-------------|---|
| | | | Methodology | Frequency | Responsibility |
| | | | site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. Photo evidence is required. | wet season. | |
| 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. Photo evidence is required. | Bi-annually | Facility Environmental Manager / onsite ECO |

Table 4: Management plan for the decommissioning phase

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

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|--------------|---|---|---|---|----------------|
| | | | Methodology | Frequency | Responsibility |
| | | effectively collect and safely disseminate any run-off water from all accumulation points, and it must prevent any potential down slope erosion. | specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. | completion of decommissioning, until final sign-off is achieved. | |
| Erosion | That vegetation clearing does not pose a high erosion risk. | Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. | Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation. | Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved. | ECO |
| Topsoil loss | That topsoil loss is minimised | <p>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.</p> <p>During rehabilitation, the stockpiled topsoil must be evenly spread over</p> | 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. | ECO |

| Impact | Mitigation / management objectives and outcomes | Mitigation / management actions | Monitoring | | |
|--------|---|---------------------------------|-------------|-----------|----------------|
| | | | Methodology | Frequency | Responsibility |
| | | the entire disturbed surface. | | | |

11 ADDITIONAL ASPECTS REQUIRED IN AN AGRICULTURAL ASSESSMENT

11.1 Micro siting

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. The choice of the site has already avoided viable cropland. Further micro-siting will make no material difference to agricultural impacts and disturbance.

11.2 Confirmation of linear activity exclusion

If linear infrastructure has been given exclusion from complying with certain requirements of the agricultural protocol because of its linear nature, the protocol requires confirmation that the land impacted by that linear infrastructure can be returned to the current state within two years of completion of the construction phase. No such exclusion applies to this project.

11.3 Compliance with the allowable development limits

The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy facility during its operational phase, and that result in the exclusion of that land from potential cultivation or grazing. It excludes all areas that were already occupied by roads and other infrastructure prior to the establishment of the energy facility but includes the surface area required for expanding existing infrastructure (e.g. widening existing roads). It excludes the corridor underneath overhead power lines but includes the pylon footprints. It therefore represents the total land that is actually excluded from agricultural use as a result of the renewable energy facility (the agricultural footprint).

The allowable development limit on land of low and medium agricultural sensitivity with a land capability of < 8, as this site has been verified to be, is 2.5 ha per MW. This would allow the proposed facility of 1000 MW to occupy an agricultural footprint of $1000 \times 2.5 = 2500$ hectares. The wind facility being assessed will occupy an agricultural footprint of <300 hectares. It is therefore confirmed that the agricultural footprint of this development will be well within the allowable limit. It will in fact be approximately eight times smaller than what the development limits allow.

11.4 Long term benefits versus agricultural benefits

The development will generate a significant and reliable additional income for the 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 than existing, coal powered energy generation.

11.5 Additional environmental impacts

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

11 CONCLUSION

The overall conclusion of this assessment is that the proposed development is desirable from an agricultural perspective because it offers a valuable, win-win opportunity for a renewable energy facility to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of agricultural land with no loss of future agricultural production potential.

The screening tool classifies the assessed area as ranging from low to high agricultural sensitivity. This assessment disputes some of the detail of the sensitivity classification by the screening tool. It confirms the high sensitivity rating as a result of cropping status, but only for small, isolated patches of cropland that will be avoided by the development infrastructure, anyway. It disputes a classified land capability of >6 and rates the entire assessed area as having a maximum land capability of 6.

The climate is classified as arid with a mean annual rainfall of 157 mm and evaporation of 1474 mm. Climate is therefore the limiting factor for land capability, regardless of the soil and terrain capability, although shallow, rocky soils are an additional limitation. Moisture availability is very limiting to any kind of agricultural production, including grazing and is completely insufficient for rain-fed crop production. The climate constraints mean that the site has very low agricultural potential and its agricultural use is limited to grazing only.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of a development. In the case of wind farms, the amount of land excluded from agriculture 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, and regardless of the duration of the impact. Furthermore, wind farms have both positive and negative effects on the production potential of land, and it is the net

sum of these positive and negative effects that determines the extent of the change in future production potential. The positive effects include increased financial security for farming operations; improved security; and an improved road network.

Due to the fact that the proposed development will exclude agricultural production from only an insignificantly small area of land and that its negative impact is offset by economic and other benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

From an agricultural impact point of view, it is recommended that the proposed 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 implementation of the proposed mitigation measures.

12 REFERENCES

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

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

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 Consultants 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*.



forestry, fisheries & the environment

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Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

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APPENDIX 2: SPECIALIST DECLARATION FORM AUGUST 2023

Specialist Declaration form for assessments undertaken for 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)

REPORT TITLE: THE CARISSA WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR BEAUFORT WEST, WESTERN CAPE PROVINCE

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. 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.dffe.gov.za/documents/forms>.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020*', where applicable.

1. SPECIALIST INFORMATION

| | |
|--|--|
| Title of Specialist Assessment | Agricultural Assessment |
| Specialist Company Name | SoilZA (sole proprietor) |
| Specialist Name | Johann Lanz |
| Specialist Identity Number | 6607045174089 |
| 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 |
| Telephone | Not applicable |
| Cell phone | +27 82 927 9018 |
| E-mail | johann@soilza.co.za |

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz** declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. “the Protocols”) and in Government Notice No. 1150 of 30 October 2020.
- 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 NEMA Act.



Signature of the Specialist

SoilZA (sole proprietor)

Name of Company:

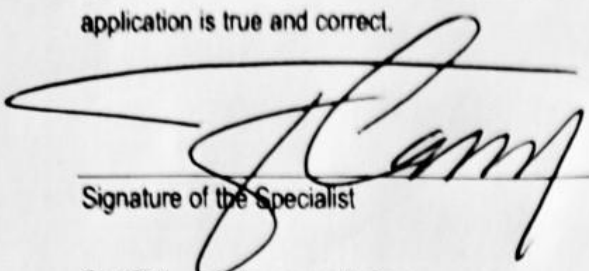
18 September 2024

Date

SPECIALIST DECLARATION FORM – AUGUST 2023

3. UNDERTAKING UNDER OATH/ AFFIRMATION

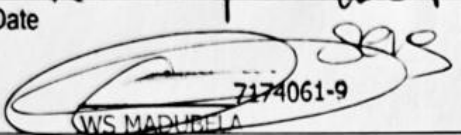
I, **Johann Lenz**, swear under oath that all the information submitted or to be submitted for the purposes of this application is true and correct.


Signature of the Specialist

SoilZA – sole proprietor

Name of Company

18 September
Date


Signature of the Commissioner of Oaths

2024-09-18
Date





herewith certifies that

Johan Lanz

Registration Number: 400268/12

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Soil Science (Professional Natural Scientist)

Effective 15 August 2012

Expires 31 March 2025



Chairperson

Chief Executive Officer



APPENDIX 4: PROJECTS INCLUDED IN CUMULATIVE IMPACT ASSESSMENT

Table 5: Table of all projects that were included in the cumulative impact assessment.

| DFFE Reference | Project name | Technology | Capacity (MW) |
|---------------------|---|------------|---------------|
| TBC | Carissa Wind Energy Facility | WEF | 1000 |
| 12/12/20/1784 | Proposed renewable energy facility at Beaufort West | WEF | 170 |
| 12/12/20/2133 | Proposed Construction of 19MW Photovoltaic Solar Facility Proposed By Lurama 214 Pty Ltd On Portion 1 Of The Farm Steenrotsfontein 168, Beaufort West, Western Cape Province | SEF | 19 |
| 12/12/20/2685 | The Construction Of The 10mw Roma Energy Leeu Gamka Solar Plant On Portion 40 Of The Farm Kruidfontein No 33, Western Cape Province | SEF | 10 |
| 14/12/16/3/3/1/2494 | The proposed 220MW Jessa m wind energy facility (WEF) and associated infrastructure near Beaufort west in the Western Cape Province | WEF | 220 |
| 14/12/16/3/3/1/2496 | The proposed 220MW jessa z wind energy facility (WEF) and associated infrastructure, near Beaufort West in the Western Cape Province | WEF | 220 |
| 14/12/16/3/3/1/2497 | Proposed 203,5 MW Jessa s wind energy facility (WEF) and associated infrastructure, near Beaufort West in the Western Cape Province | WEF | 204 |
| 14/12/16/3/3/1/2673 | The proposed development of the Beaufort West Solar Renewable Energy Facility (SEF) and the associated infrastructure near Beaufort West Local Municipality in the Western Cape Province. | SEF | 415 |
| 14/12/16/3/3/2/2070 | The proposed development of the 279MW Kwagga wind energy facility 1 (Kwagga WEF 1), near Beaufort West, Western Cape Province | WEF | 279 |
| 14/12/16/3/3/2/2071 | The Proposed Development of the 341 MW Kwagga Wind Energy Facility (i.e. Kwagga WEF 2), near Beaufort West, Western Cape Province. | WEF | 341 |
| 14/12/16/3/3/2/2072 | The proposed development of the 204,6 MW Kwagga wind energy facility 3 (Kwagga WEF 3) near Beaufort West, Western Cape Province | WEF | 205 |

| | | | |
|---------------------|--|-----|-------------|
| 14/12/16/3/3/2/2120 | The proposed development of the Koup 1 wind energy facility (WEF) and associated infrastructure near Beaufort in the Western Cape Province | WEF | 184 |
| 14/12/16/3/3/2/2121 | The Koup 2 WEF and its associated infrastructure near Beaufort West, Western Cape Province | WEF | 211 |
| 14/12/16/3/3/2/2263 | The proposed development of up to 240MWac Heuweltjies Wind Energy Facility (WEF), Battery Energy Storage System (BESS), 11-33kV portion / yard of the shared 11-33kV/132kV onsite substation Prince Albert Local Municipality, Western Cape Province. | WEF | 240 |
| 14/12/16/3/3/2/2264 | Proposed development of up to 240MWac Kraaltjies Wind Energy Facility (WEF), Battery Energy Storage System (BESS), 11-33kV portion / yard of the shared 11-33kV/132kV onsite substation & associated infrastructure, Beaufort West, Western Cape Province. | WEF | 240 |
| 14/12/16/3/3/2/772 | Proposed establishment of the Beaufort West Solar Power Plant Site 1, Western Cape Province | SEF | 90 |
| 14/12/16/3/3/2/773 | Proposed Establishment of the Beaufort West Solar Power Plant Site 2, Western Cape Province | SEF | 90 |
| 14/12/16/3/3/2/774 | Proposed Beaufort West Solar power plant site 3 near Beaufort West, Western Cape Province | SEF | 90 |
| TBC | Carissa Wind Energy Facility | | |
| Total solar | | | 714 |
| Total wind | | | 3514 |
| Total | | | 4228 |

Note: Electrical grid infrastructure projects do not contribute to a loss of agricultural land (see Section 9.2) and are not therefore included in this table and in the calculation of cumulative land loss.

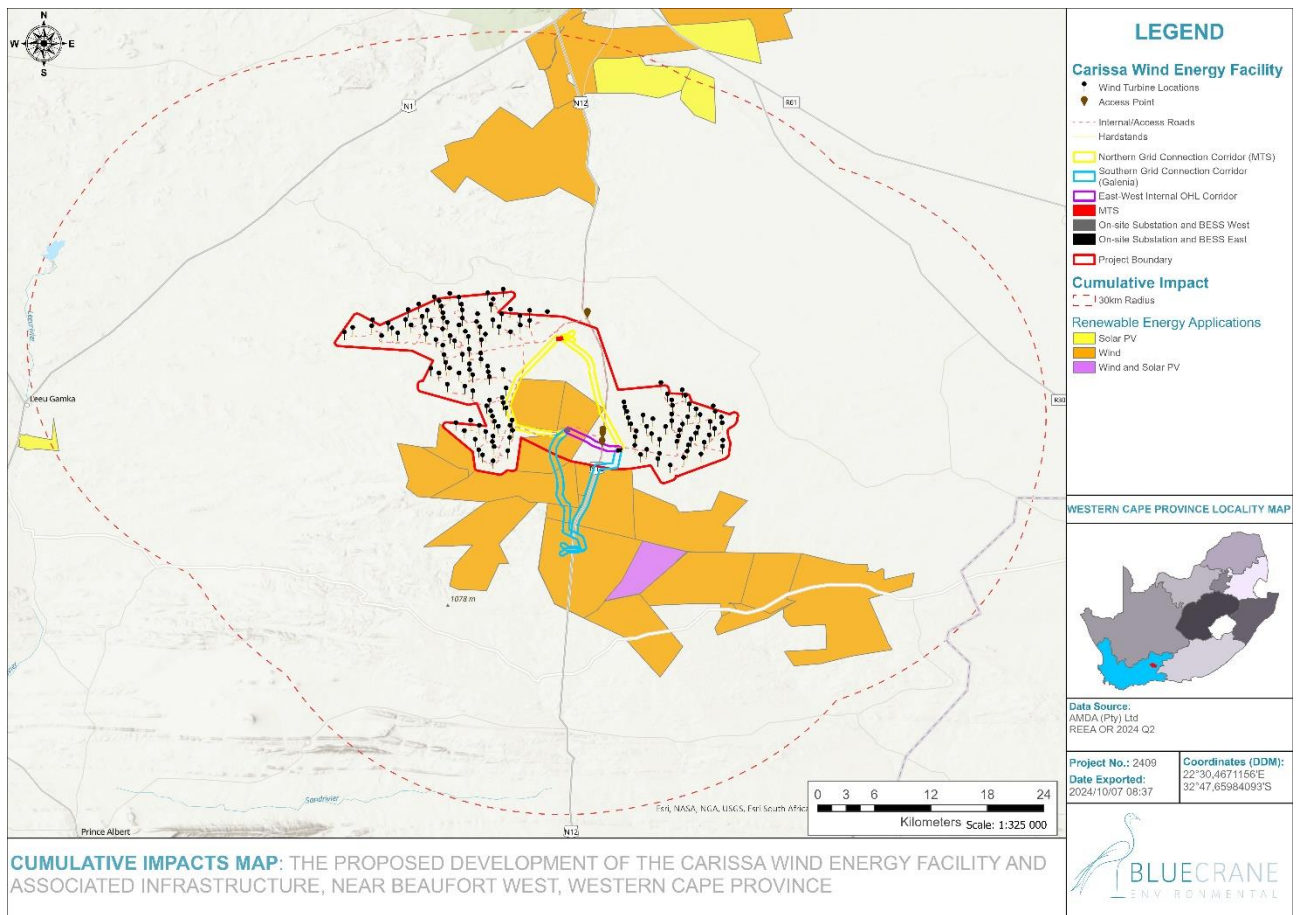


Figure 6. Map of projects considered for cumulative impacts.

APPENDIX 5: SOIL DATA

Table 4: land type soil data

| Land type | Soil series (forms) | Depth (mm) | Clay % A horizon | Clay % B horizon | Depth limiting layer | % of land type |
|-----------|---------------------|------------|---------------------|---------------------|----------------------|----------------|
| Fc160 | Ms | 50 - 200 | 6 - 15 | | R | 36,6 |
| Fc160 | Gs | 100 - 300 | 6 - 20 | 10 - 20 | so | 29,0 |
| Fc160 | R | | | | | 23,4 |
| Fc160 | Oa | 500 > 1200 | 6 - 10 | 10 - 25 | R,U,ca | 3,8 |
| Fc160 | Hu | 200 - 600 | 6 - 15 | 10 - 20 | R,so | 2,3 |
| Fc160 | Du | 500 > 1200 | 0 - 6 | | R,U,ca | 2,0 |
| Fc160 | Sw | 200 - 300 | 6 - 15 | 20 - 40 | vr | 1,9 |
| Fc160 | Sw | 200 - 300 | 6 - 15 | 20 - 40 | vr | 1,1 |
| Fc162 | Hu | 100 - 300 | 6 - 15 | 10 - 20 | R | 29,5 |
| Fc162 | Gs | 40 - 200 | 6 - 18 | 15 - 40 | R,so | 19,3 |
| Fc162 | Gs | 100 - 200 | 6 - 18 | 15 - 35 | R,so | 11,5 |
| Fc162 | Oa | 500 > 1200 | 10 - 15 | 15 - 35 | R | 9,0 |
| Fc162 | Hu | 120 - 400 | 15 - 20 | 20 - 35 | R | 7,8 |
| Fc162 | Ms | 50 - 100 | 6 - 15 | | R | 7,7 |
| Fc162 | Sw | 150 - 300 | 15 - 20 | 35 - 45 | vr | 5,5 |
| Fc162 | R | | | | | 4,6 |
| Fc162 | Oa | 500 > 1200 | 15 - 20 | 15 - 35 | R | 4,5 |
| Fc162 | Du | 500 > 1200 | 0 - 6 | | R | 0,8 |
| Fc164 | Ms | 30 - 100 | 10 - 35 | | R | 33,8 |
| Fc164 | R | | | | | 24,5 |
| Fc164 | Gs | 100 - 200 | 6 - 20 | | R,so | 24,5 |
| Fc164 | Hu | 100 - 200 | 6 - 15 | 15 - 25 | R | 7,3 |
| Fc164 | Oa | 500 > 1200 | 6 - 10 | 10 - 25 | R | 6,0 |
| Fc164 | Oa | 500 > 1200 | 6 - 10 | 10 - 25 | R | 2,0 |
| Fc164 | Du | 500 > 1200 | 0 - 6 | | R | 2,0 |
| Fc183 | Oa | 500 > 1200 | 10 - 15 | 10 - 30 | R,U,ca | 36,0 |
| Fc183 | Du | 500 > 1200 | 0 - 6 | | R,U,ca | 18,0 |
| Fc183 | Gs | 100 - 300 | 6 - 15 | 15 - 35 | so | 16,1 |
| Fc183 | Ms | 50 - 150 | 6 - 15 | | R | 11,4 |
| Fc183 | R | | | | | 10,4 |
| Fc183 | Hu | 100 - 300 | 6 - 15 | 10 - 25 | R,so | 6,3 |
| Fc183 | Sw | 100 - 250 | 6 - 15 | 20 - 45 | vr | 1,8 |

