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AGRICULTURAL AND SOILS IMPACT ASSESSMENT FOR PROPOSED DE AAR 2 SOUTH GRID CONNECTION ROUTES AND SWITCHING STATION IN NORTHERN CAPE PROVINCE

BA PHASE REPORT

Report by
Johann Lanz

Prepared for
Arcus Consultancy Services South Africa (Pty) Ltd
Cape Town

1 December 2020

Johann Lanz - Professional profile

Education

• M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - June 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 am registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science, registration number 400268/12, and am a member of the Soil Science Society of South Africa.

Soil Science Consultant **Self employed** **2002 - present**

I run a soil science consulting business, servicing clients in both the environmental and agricultural industries. Typical consulting projects involve:
Soil specialist study inputs to EIA's, SEA's and EMPR's. These have focused on impact assessments and rehabilitation on agricultural land, rehabilitation and re-vegetation of mining and industrially disturbed and contaminated soils, as well as more general aspects of soil resource management. Recent clients include: CSIR; SRK Consulting; Aurecon; Mainstream Renewable Power; SiVEST; Savannah Environmental; Subsolar; Red Cap Investments; MBB Consulting Engineers; Enviroworks; Sharples Environmental Services; Haw & Inglis; BioTherm Energy; Tiptrans.
Soil resource evaluations and mapping for agricultural land use planning and management. Recent clients include: Cederberg Wines; Unit for Technical Assistance - Western Cape Department of Agriculture; Wedderwill Estate; Goedgedacht Olives; Zewenwacht Wine Estate, Lourensford Fruit Company; Kaarsten Boerdery; Thelema Mountain Vineyards; Rudera Wines; Flagstone Wines; Solms Delta Wines; Dornier Wines.

Soil Science Consultant **Agricultural Consultors International (Tinie du Preez)** **1998 - end 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 make recommendations on 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

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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

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

PROJECT TITLE

DE AAR 2 SOUTH GRID CONNECTION AND SWITCHING STATION IN NORTHERN CAPE PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
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Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

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

1. SPECIALIST INFORMATION

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

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, declare that –

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

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

13/01/2021

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

13/01/2021

Date

Signature of the Commissioner of Oaths

20/01/13

Date

SOUTH AFRICAN POLICE SERVICE
STATION COMMANDER
WYNBERG
2021 -01- 13
STASIEBEVELVOEDER
WYNBERG
SOUTH AFRICAN POLICE SERVICE

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Executive Summary

The proposed development is on land zoned and used for agricultural grazing. South Africa has very limited arable land and it is therefore critical to ensure that development does not lead to an inappropriate loss of land that may be valuable for cultivation. This assessment has found that the proposed site is on land which is unsuitable for cultivation due to both climate and soil limitations.

The key findings of this study are:

- The dominant soils are shallow, calcareous, sandy loam soils on underlying rock, of the Mispah, Glenrosa and Swartland soil forms.
- The major limitation to agriculture is the limited climatic moisture availability. The shallow, rocky soils are a further limitation.
- As a result, the site is unsuitable for cultivation, and agricultural land use is limited to grazing.
- The project site is classified with a predominant land capability evaluation value of 5 - 6 (low to moderate). The site has a grazing capacity of 20 hectares per large stock unit.
- No agriculturally sensitive areas occur within the proposed development area and no part of it is therefore required to be set aside from the development.
- The proposed development has negligible impact on agriculture in this environment for two reasons:
    - all agricultural activities can continue completely unhindered underneath transmission lines.
    - the actual footprint of disturbance of the infrastructure, that precludes agricultural land use, constitutes only a negligible proportion of the available land surface area.
- The only possible impact of the development was identified as minimal soil and land degradation as a result of land disturbance during construction and decommissioning.
- This impact was assessed as having low significance with mitigation.
- Cumulative impact is also assessed as low because of the low impact of the development, and the low agricultural potential of the area.
- The recommended mitigation measures are implementation of an effective system of storm water run-off control; maintenance of vegetation cover; and striping, stockpiling and re-spreading of topsoil.
- Due to the low agricultural potential of the site, and the consequent low, negative

agricultural impacts, the development will not have an unacceptable negative impact on the agricultural production capability of the site. From an agricultural impact (including soils) point of view, the development can be approved.

2 INTRODUCTION

Mulilo De Aar 2 South (Pty) Ltd is proposing the construction of a grid connection route from the Eskom Hydra Substation, 10 km south-east of De Aar (see Figure 1).

Environmental authorisation is being sought for one proposed transmission line and a switching station. Route 1 is 23 km in length, to connect the authorised De Aar 2 South Wind Energy Facility (DA2S WEF) directly to the Eskom Hydra Substation. Route 2 deviates from this to connect the DA2S WEF to an approved solar substation and then to the Eskom Hydra Substation. The grid connection is for up to 400 kV. The proposed project will include an up to 400 kV switching station (100m x 100m). The proposed transmission line would consist of the following infrastructures:

- Either steel monopole or lattice tower structures with maximum heights of 30 m, including foundations and insulators;
- Existing access roads and jeep tracks;
- Line and servitude clearances to meet the statutory requirements.

The objectives of this study is to identify and assess all potential impacts of the proposed development on agricultural resources, including soils, and agricultural production potential, and to provide recommended mitigation measures and rehabilitation guidelines for all identified impacts. Johann Lanz was appointed by Arcus Consultancy Services as an independent specialist to conduct this Agricultural Impact Assessment.

Figure 1. *Location map of the proposed projects, east of the town of De Aar.*

3 TERMS OF REFERENCE

The terms of reference for this study is to be a specialist report that fulfills the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted in March 2020. This protocol has replaced Appendix 6 of the 2014 EIA Regulations.

A specialist report should:

1. Provide a baseline description of the receiving environment in and surrounding the development, including the identification of any no go areas.
2. Identify and assess all potential impacts (direct, indirect and cumulative) of the proposed development, including alternatives, on soils and agricultural potential.
3. Propose mitigation and remedial measures.
4. Propose impact management outcomes and any monitoring requirements for inclusion in the EMPr.

The agricultural sensitivity of the site, according to the screening tool associated with the protocol, is low and medium. The protocol therefore requires only an Agricultural Compliance Statement, which does not require a field assessment.

The protocol states that an Agricultural Compliance Statement must be prepared by a competent soil scientist/agricultural specialist registered with SACNASP.

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

1. be applicable to the preferred site and proposed development footprint;
2. confirm that the site is of "low" or "medium" sensitivity for agriculture *(Section 6.7)*; and
3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site *(Section 9)*.

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

1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vita (following title page);
2. a signed statement of independence (following CV);
3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (Figure 3);
4. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (Section 7.4);
5. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development (Section 9);
6. any conditions to which this statement is subjected (Section 9);
7. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase (7.5);

8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 8); and
9. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 4).

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing soils and agricultural potential

This report adheres to the process and content requirements of the gazetted agricultural protocol as outlined in Section 2 above. As per the requirement, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site.

The following sources of information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries. This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the Department of Agriculture, Forestry and Fisheries, Pretoria.
- Field crop boundaries were sourced from the national web-based environmental screening tool.
- Rainfall and temperature data was sourced from The World Bank Climate Change Knowledge Portal, dated 2015.
- Grazing capacity data was sourced from the 2018 Department of Agriculture, Forestry and Fisheries 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.

4.2 Methodology for determining impact significance

The potential impacts identified in this specialist study were assessed based on the criteria given in the table below. The ratings of impacts were based on the specialist's knowledge and experience of the field conditions of the environment in which the proposed development is located, and of the impact of disturbances on that agricultural environment.

Criteria	**Rank**		
	Low	*Medium*	*High*
Intensity	Minor deterioration in land capability. Soil alteration resulting in a low negative impact on one of the other environments (e.g. ecology).	Partial loss of land capability. Soil alteration resulting in a moderate negative impact on one of the other environments (e.g. ecology).	Complete loss of land capability. Soil alteration resulting in a high negative impact on one of the other environments (e.g. ecology).
Extent	Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/national
Duration	Quickly reversible Less than the project life Short-term	Reversible over time Life of the project Medium-term	Permanent Beyond closure Long-term

The consequence of impacts is a function of the intensity, extent and duration. The significance of impacts = probability x consequence

5 CONSTRAINTS AND LIMITATIONS OF STUDY

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

The study makes the assumption that water for irrigation is not available across the site. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist, and none have been exploited in this area.

There are no other specific constraints, uncertainties and gaps in knowledge for this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

Power lines require the registration of a servitude for each farm portion crossed. In terms of the

Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA), the registration of a power line servitude requires written consent of the Minister if the following two conditions apply:

5. if the servitude width exceeds 15 metres; and
6. if Eskom is not the applicant for the servitude.

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

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

7 DESCRIPTION OF THE SOILS AND AGRICULTURAL CAPABILITY OF THE AFFECTED ENVIRONMENT

7.1 Climate and water availability

Rainfall for the development area is given as 337 mm per annum (The World Bank Climate Change Knowledge Portal, undated). The average monthly distribution of rainfall is shown in Figure 2. The low rainfall and high evapotranspiration is a severe limitation to all agriculture, including grazing.

7.2 Terrain, topography and drainage

The proposed development is located on level Karoo plains, with low slope gradients, at an altitude of between 1,260 and 1,350 metres. The eastern end of the proposed power line routes climbs steeply to the top of a plateau above the plains at an altitude of 1,500 metres, where the wind farm and battery storage facility (separate process) are located.

There are several non-perennial water courses, typical of arid areas, that drain the project area to the north-west.

The underlying geology is shales, mudstone and sandstone of the Beaufort Group and the Karoo Supergroup. Dolerite intrusions are frequent.

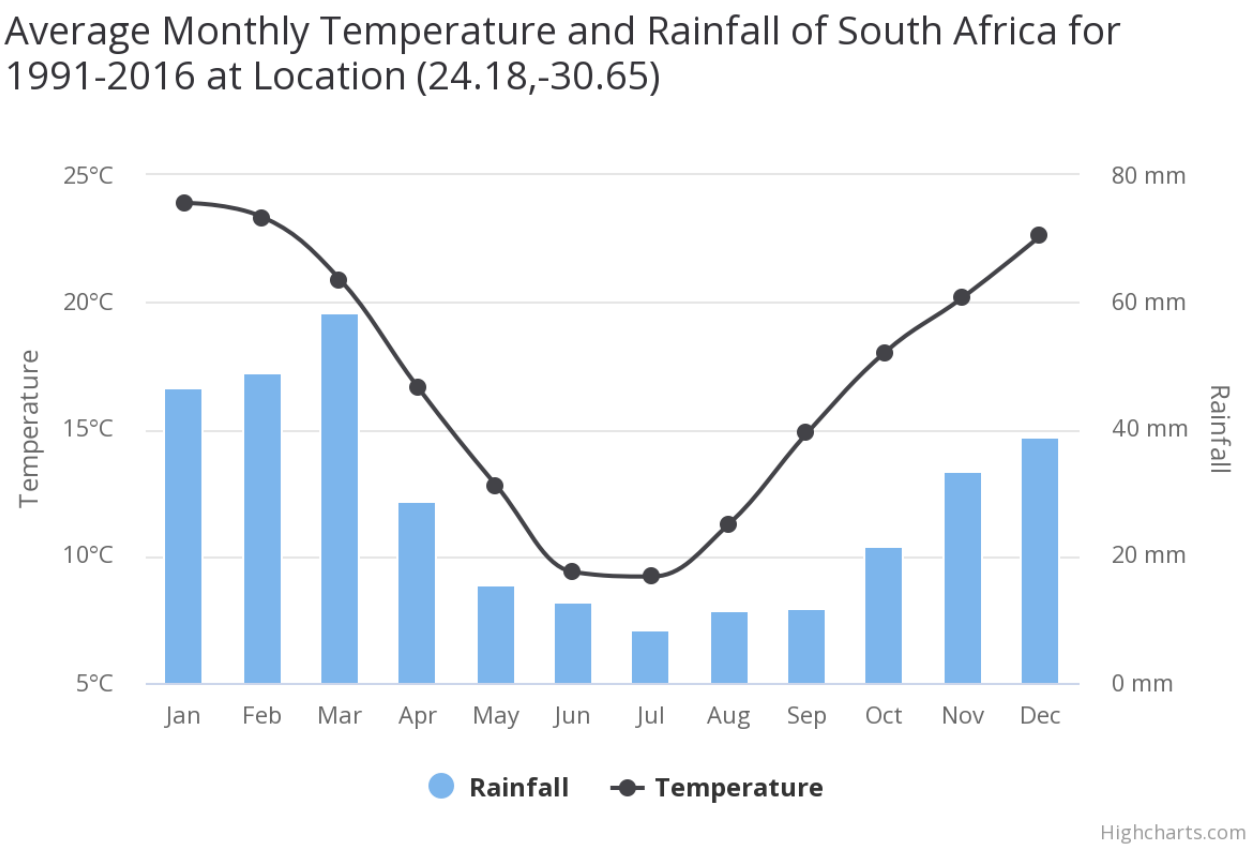

Figure 2. *Average monthly temperature and rainfall for the site (The World Bank Climate Change Knowledge Portal, 2020).*

7.3 Soils

The dominant soils are shallow, calcareous, sandy loam soils on underlying rock, of the Mispah, Glenrosa and Swartland soil forms. The shallow soil depth limits the agricultural potential.

7.4 Agricultural capability

Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rainfed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017, DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. Values below 8 are generally

not suitable for production of any cultivated crop. Detail of this land capability scale is shown in Table 2.

Land capability evaluation values range from 1 to 7 across the project area, with values of 5 and 6 predominant. Agricultural limitations that result in the low land capability classification are predominantly due to the very limited climatic moisture availability. The shallow, stony soils are a further limitation. These factors render the site unsuitable for any kind of mainstream cultivation without irrigation, and limit it to low density grazing only.

The long-term grazing capacity of the site is fairly low at 20 hectares per large stock unit.

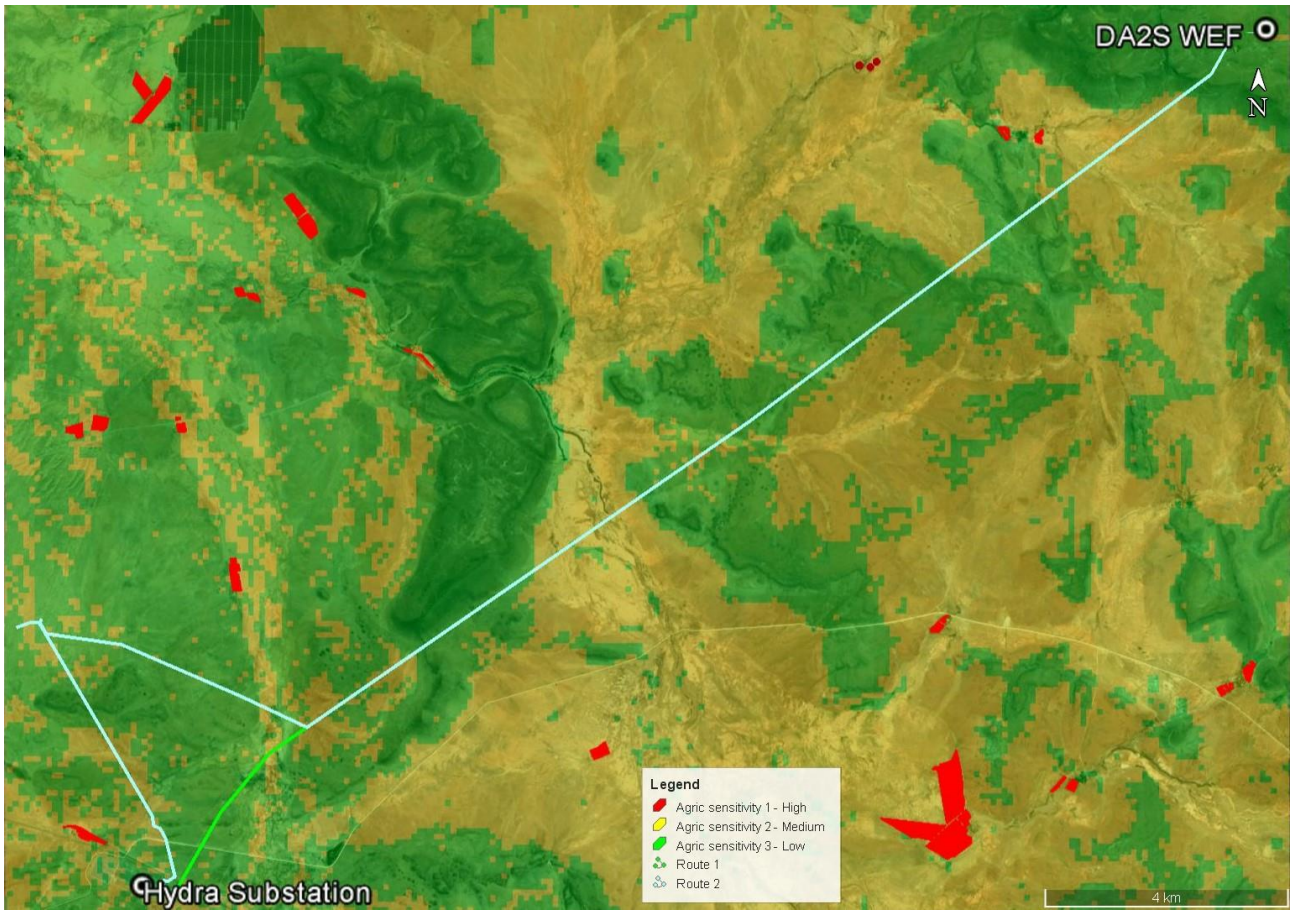

Figure 3. *Satellite image map of the proposed layout overlaid onto agricultural sensitivity.*

Table 2. Details of the 2017 Land Capability classification for South Africa.

Land capability evaluation value	Description
1	Very Low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High
12	High to Very High
13	
14	Very High
15	

7.5 Land use and development on and surrounding the site

The development is located within a sheep farming agricultural region and currently used only for grazing. There is no cultivation across the project area. The only agricultural infrastructure is fencing into grazing camps, wind pumps and stock watering points.

7.6 Possible land use options for the site

Because of predominantly climate limitations, the site is totally unsuitable for cultivated crops, and viable agricultural land use is limited to grazing only.

7.7 Agricultural sensitivity

Agricultural sensitivity is a direct function of the capability of the land for agricultural production. This is because a negative impact on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability. A general assessment of agricultural sensitivity, in terms of loss of agricultural land in South Africa, considers arable land that can support viable production of cultivated crops, to have high sensitivity. This is because

there is a scarcity of such land in South Africa, in terms of how much is required for food security. However, there is not a scarcity in the country of land that is only suitable as grazing land and such land is therefore not considered to have high agricultural sensitivity.

Agricultural sensitivity of a particular development is also a function of the severity of the impact which that development poses to agriculture. In the case of transmission lines, the impact is negligible (see impact assessment section). This even further reduces the agricultural sensitivity of the study area for the proposed development.

The national web-based environmental screening tool identifies all areas impacted by the footprint of the proposed development as being of low or medium agricultural sensitivity. This is confirmed by this assessment.

Agricultural potential and conditions are very uniform across the site, and the choice of placement of facility infrastructure, including access roads, therefore has negligible influence on the significance of agricultural impacts.

No agricultural high sensitivity areas occur within the investigated site and no parts of it therefore need to be avoided by the development. There are no required buffers.

7.7.1 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.

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment. The motivation for confirming the sensitivity is that land of the site, without doubt, corresponds to the definitions of the different sensitivity categories in terms of its land capability and cultivation status. The entire Section 6 above is dedicated to providing evidence of that.

8 IDENTIFICATION AND ASSESSMENT OF IMPACTS ON AGRICULTURE

8.1 Direct impacts

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

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

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

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

The only possible source of impact is minimal disturbance to the land during construction and decommissioning. The single agricultural impact is therefore minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during excavations. Soil degradation will reduce the ability of the soil to support vegetation growth. This is a direct, negative impact that applies to only two of the phases of the development (construction and decommissioning). It is assessed in table format below.

Impact Phase: Construction & Decommissioning							
Potential impact description: Soil degradation Soil degradation can result from erosion and topsoil loss. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance and vegetation removal. Loss of topsoil can result from poor topsoil management during construction related soil profile disturbance. Soil degradation will reduce the ability of the soil to support vegetation growth.							
	Intensity	**Extent**	**Duration**	**Status**	**Probability**	**Significance**	**Confidence**
Without Mitigation	Medium	Low	Medium	Negative	Medium	Medium	High
With Mitigation	Low	Low	Medium	Negative	Low	Low	High
Can the impact be reversed?			Soil degradation can be reversed only to some extent and only with substantial inputs over a significant period of time.				
Will impact cause irreplaceable loss of resources?			No, because a very small amount of grazing land is impacted and such land is not a scarce resource.				
Can impact be avoided, managed or mitigated?			Yes, see below.				
Mitigation measures to reduce residual risk or enhance opportunities: (δ) Implement an effective system of storm water run-off control using bunds and ditches, where it is required - that is at all points of disturbance where water accumulation might occur. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion. (ε) Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. (ϕ) 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.							

Note: The assessment is identical for each of the two routes.

The intensity is considered medium without mitigation because unchecked erosion would cause a partial loss of land capability. With effective mitigation, degradation can be prevented and the intensity is therefore considered low. The extent is low because the impact is limited to within the project area and only to parts of it. The duration is low because the impact will only last for the short term after disturbance.

8.2 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 or degradation of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

> What level of loss of agricultural land use and associated loss of agricultural production is acceptable in the area, and will the loss associated with the proposed development, cause that level in the area to be exceeded?

Because of the negligible agricultural impact of the proposed development in such an agricultural environment, far more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change are exceeded. Acceptable levels of change in terms of other types of impact, for example visual impact, would be exceeded long before the levels for agricultural impact became an issue. For the above reasons, the cumulative agricultural impact of the proposed development can confidently be assessed as negligible without entering into a more formal assessment.

8.3 Impacts of the no-go alternative

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential such impact is that due to continued low rainfall in the area, in addition to other economic and market pressures on farming, the agricultural enterprises will come under increased pressure in terms of economic viability, with resultant potential decrease in productivity.

The extent to which the development and the no-go alternative will impact agricultural production

are more or less equal, which results in there being, from an agricultural impact perspective, no preferred alternative between the development and the no-go.

8.4 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. This is confirmed. Because of the agricultural uniformity and low agricultural potential of the environment, the exact positions of all infrastructure will make no significant difference to agricultural impacts.

8.5 Confirmation of linear activity impact

The protocol provision of a linear impact confirmation only makes sense when the requirement for an Agricultural Compliance Statement is based on the fact that the development is a linear activity. In this case the low and medium agricultural sensitivity determines that an Agricultural Compliance Statement suffices. Nevertheless, it is hereby confirmed that, due to the low impact, the land can be returned to the current state within two years of completion of the construction phase.

9 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

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

Table 1: Management plan for the planning and design phase

Impact	**Mitigation / management objectives and outcomes**	**Mitigation / management actions**	**Monitoring**		
			Methodology	**Frequency**	**Responsibility**
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces	Design an effective system of storm water run-off control,	Ensure that the storm water run-off control is included in the	Once-off during the design phase.	Holder of the EA

	causes no erosion on or downstream of the site.	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 hardened surfaces and it must prevent any potential down slope erosion.	engineering design.		

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	Implement an effective system of storm water run-off control, where it is required - that is at any points	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm	Monthly	Environmental Control Officer (ECO)

	the site.	where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.	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.		
	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 3 months	Environmental Control Officer (ECO)
Topsoil loss	That no topsoil is lost	If an activity will mechanically disturb the soil below surface	Record GPS positions of all occurrences of below-surface soil	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

		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.	disturbance (eg excavations). Record date of topsoil stripping and replacement. Check that topsoil covers entire disturbed area.		

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	That existence of hard surfaces causes no erosion on or downstream of	Maintain the storm water run-off control system. Monitor erosion and	Undertake a periodic site inspection to verify and inspect the effectiveness	Bi-annually	Facility Environmental Manager

	the site.	remedy the storm water control system in the event of any erosion occurring.	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.		
	That denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 4: Management plan for the decommissioning phase

Impact	**Mitigation / 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 hardened surfaces 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.	Monthly	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	Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	Every 3 months	Environmental Control Officer (ECO)

		against erosion.			
Topsoil loss	That no topsoil is lost	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 (eg excavations). Record date of topsoil stripping and replacement. Check that topsoil covers entire disturbed area.	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

10 **CONCLUSION AND RECOMMENDATIONS**

The site has very low agricultural potential, is unsuitable for cultivation and agricultural land use is limited to low density grazing.

The main conclusion of the assessment is that:

Due to the low agricultural potential of the site, and the consequent low, negative agricultural impacts, the development will not have an unacceptable negative impact on the agricultural production capability of the site. From an agricultural impact point of view, the development can be approved.

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

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

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