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

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

1A Wolfe Street
Wynberg
7800
Cape Town
South Africa

SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR REZONING, SUBDIVISION AND HOUSING DEVELOPMENT ON FARM NUMBER RE/2833, GROOT BRAKRIVIER, WESTERN CAPE PROVINCE

Report by
Johann Lanz

6 June 2023

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1 INTRODUCTION

Environmental and change of land use authorisation is being sought for a proposed housing development on Farm number RE/2833, in Groot Brakrivier, 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, based on the verified medium agricultural sensitivity of the site (see Section 7), the level of agricultural assessment required is an Agricultural Compliance Statement.

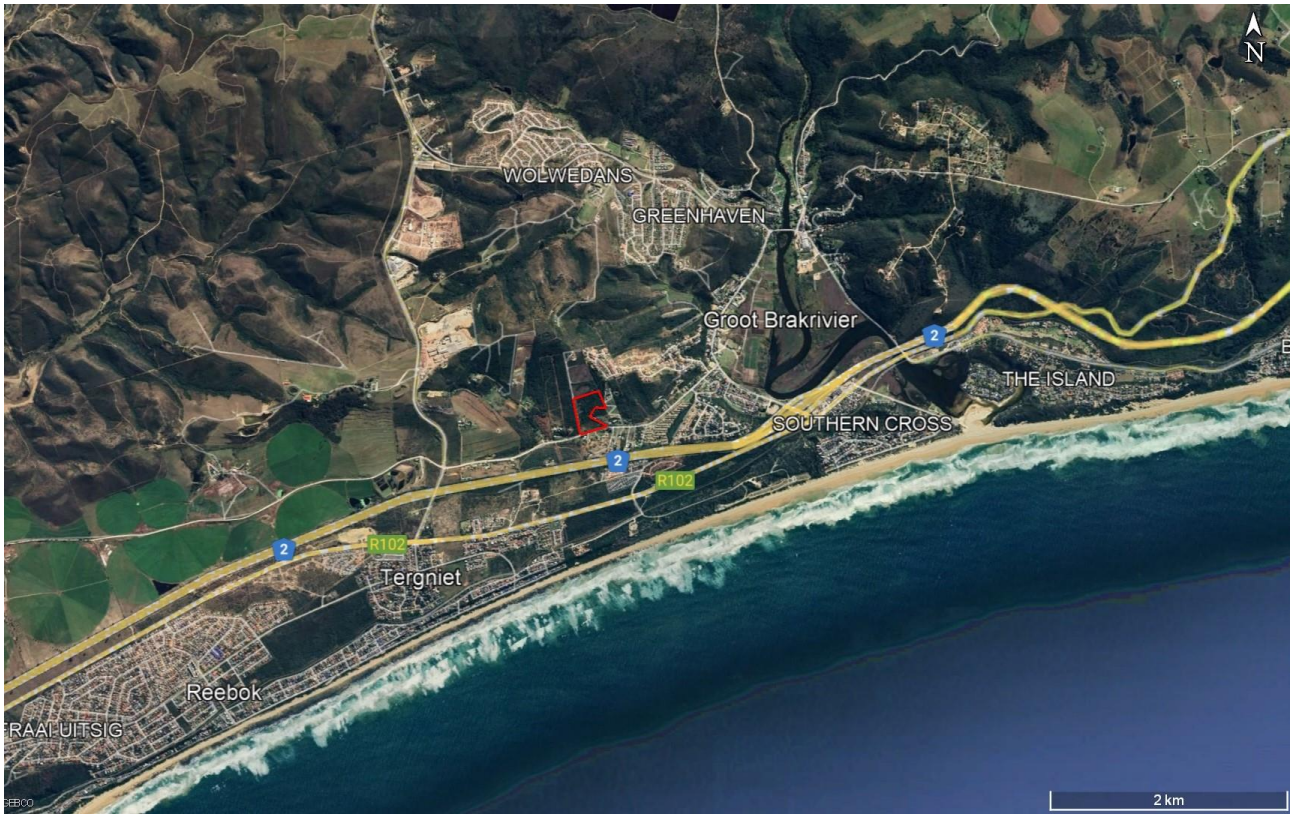

Figure 1. *Locality map of the property (dark blue outline within red circle) on the southern outskirts of the town of Vredenburg.*

The purpose of the agricultural component in the environmental assessment process is to preserve agricultural production potential by ensuring that development does not unnecessarily exclude existing or potential agricultural production from land, or unnecessarily impact agricultural land to the extent that its production potential is reduced. The primary focus is on preservation of the agricultural production potential of scarce, arable land. The essential question that an agricultural assessment must answer is: Will the proposed development or will it not result in a significant loss of land that has economically viable future cropping potential. The logic of the assessment is to determine how much land will be lost and what the cropping potential of that land is (for more detail see Section 9). This project poses very little threat to agricultural production potential because the impacted land already has serious limitations for agricultural production.

2 PROJECT DESCRIPTION

The proposed development is for rezoning, subdivision and housing development. The project will cause the permanent exclusion of potential agricultural production from the entire property. Once agriculture is excluded from the property, there can be no further on-site agricultural impact. There is also no off-site agricultural impact. The design and layout of the development within the property is therefore of no relevance to agricultural impacts and it is unnecessary to consider it any further in this assessment. All that is of relevance is the loss of the total property to potential agricultural production.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, 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 Compliance Statement, as stipulated in the agricultural protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets.

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) **(Appendix 3)**.
2. The compliance statement must:
    1. be applicable to the preferred site and proposed development footprint **(Figures 1 to 3)**;
    2. confirm that the site is of “low” or “medium” sensitivity for agriculture **(Section 7)**; and
    3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site **(Section 10)**.
3. The Agricultural Compliance Statement must contain, as a minimum, the following information:
    1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae **(Appendix 1)**;
    2. a signed statement of independence by the specialist **(Appendix 2)**;
    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 2)**;
    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 **(not applicable)**;

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 10)**;
6. any conditions to which this statement is subjected **(Section 10)**;
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 **(not applicable)**;
8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr **(Section 9)**; and
9. a description of the assumptions made and any uncertainties or gaps in knowledge or data **(Section 5)**.

4 METHODOLOGY OF STUDY

The assessment was based on a verification of current agricultural land use on the site and was informed by existing soil and agricultural potential data for the site. The following sources of existing data were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- The spatial demarcation of Protected Agricultural Areas was obtained from the National Department of Agriculture, Land Reform and Rural Development (DALRRD).
- Field crop boundaries were sourced from Crop Estimates Consortium, 2019. Field Crop Boundary data layer, 2019. Pretoria. Department of Agriculture, Forestry and Fisheries.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper. Note that Cape Farm Mapper includes national coverage of climate, grazing and certain other data.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Current and historical satellite imagery of the site and surrounds was sourced from Google

Earth.

This 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

The project requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) because it is on agriculturally zoned land. 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.

7 SITE SENSITIVITY VERIFICATION

Agricultural sensitivity is a direct function of the capability of the land for agricultural production. The different categories of agricultural sensitivity indicate the priority by which land should be conserved as agricultural production land. The agricultural sensitivity of the site, as given by the web-based environmental screening tool, is shown in Figure 2. The screening tool classifies agricultural sensitivity according to only two independent criteria, both of which are indicators of the land's agricultural production potential:

1. whether the land is cropland or not, and
2. what its land capability rating is

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, released in 2016. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values (<8) are only likely to be suitable as non-arable grazing land. The direct relationship between land capability rating and agricultural sensitivity is shown in Table 1.

Table 1. Relationship between land capability and agricultural sensitivity as given by the screening tool.

Land capability value	Agricultural sensitivity
1 - 5	low
6 - 8	medium
9 - 10	high
11 - 15	very high

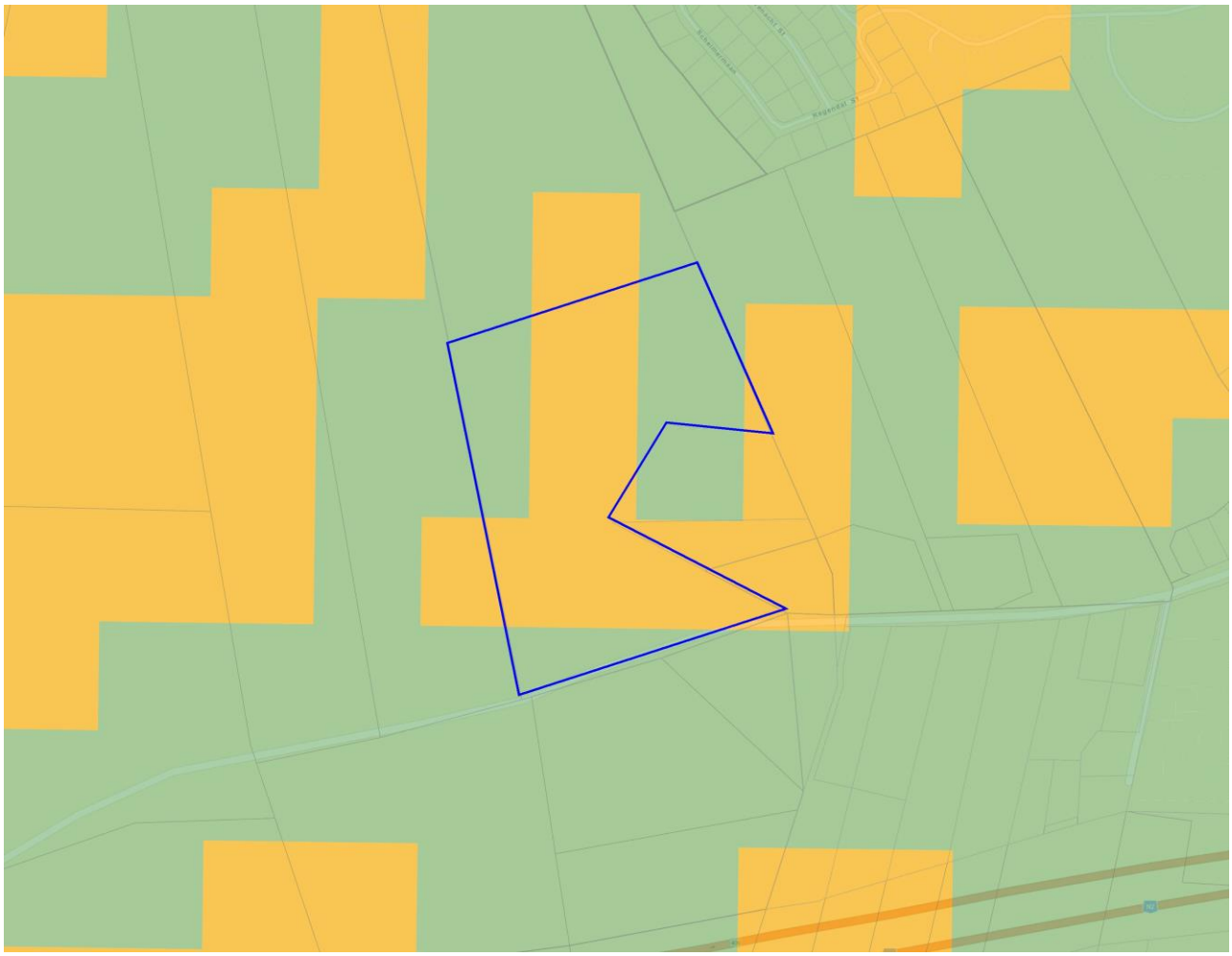

Figure 2. *The proposed development site overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). This screening tool sensitivity is confirmed by this assessment.*

Because the land capability data is generated by GIS modelling and because it is applicable at a fairly small scale (1:50 000 to 1:100 000) it is not necessarily accurate for a specific site and therefore needs verification. Because crop boundaries change over time, they also need verification.

The screening tool rating of the agricultural sensitivity of the assessment area is low to medium because it is not within crop boundaries and has a classified land capability of 4 to 8. This assessment verifies that the site is not within crop boundaries and verifies the classified land capability, based on the assessment of the cropping potential of the site in this report (see Section 8). This assessment therefore confirms the rating of the sensitivity by the screening tool and verifies the assessment area as being of low to medium agricultural sensitivity.

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The purpose of this section of an agricultural impact assessment report is to present the baseline information that controls the agricultural production potential of the site so that an assessment of that potential can be made. Agricultural production potential is one of the three factors that determines the significance of the agricultural impact (see Section 9).

All important parameters that control the agricultural production potential of the site are given in Table 2. The land type soil data is given in Appendix 4. A satellite image map of the development site is given in Figure 3.

The site falls outside of an area that is classified as a Protected Agricultural Area. A Protected Agricultural Area is a demarcated area in which the climate, terrain, and soil are generally conducive for agricultural production and which, historically, has made important contributions to the production of the various crops that are grown across South Africa. Within Protected Agricultural Areas, the protection, particularly of arable land, is considered a priority for the protection of food security in South Africa, but the protection of land outside of these areas is generally not considered a food security priority.

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

	Parameter	Value
Climate	Köppen-Geiger climate description	Arid, steppe, cold
	Mean Annual Rainfall (mm)	504
	Reference Crop Evaporation Annual Total (mm)	866
	Climate capability classification (out of 9)	6 (moderate-high)
Terrain	Terrain type	Foot slopes of steep hills
	Slope gradients (%)	7 to 30
	Altitude (m)	30 to 80
	Terrain capability classification (out of 9)	3 (low) to 5 (moderate)
Soil	Geology	KIRKWOOD FORMATION: Variegated (reddish-brown and greenish) silty mudstone and sandstone, subordinate grey shale and sandstone
	Land type	Dc28 (top) and Hb62 (bottom)
	Description of land type soils	Dc28: Very shallow to moderately deep, medium textured soils on underlying clay Hb62: Predominantly deep, light-grey coloured regic sands
	Dominant soil forms	Dc28: Valsrivier, Sterkspruit Hb62: Fernwood
	Soil capability classification (out of 9)	4 (low-moderate) to 6 (moderate-high)
Land use	Agricultural land use in the surrounding area	Mainly non-agricultural land use, with occasional pastures
	Agricultural land use on the site	None
	Land Cover classification on the site	Fallow lands & old fields (trees) and contiguous low forest & thicket
General	Long-term grazing capacity (hectares per Large Stock Unit)	35 (moderate-high)
	Land capability classification (out of 15)	4 (low-very low) to 8 (moderate)
	Within Protected Agricultural Area	No

8.1 Assessment of the agricultural production potential

This assessment of the agricultural production potential of the site is based on an integration of the different parameters in Table 2 above.

Although cropping may occur in the area, the cropping potential of the site is limited by the

combination of climate, terrain, and soil constraints. Slopes are steep. The soils on site are limited by shallow depths and low water and nutrient holding capacity. Furthermore, factors other than climate, terrain, and soil capability also constrain the potential of the property to practically deliver agricultural produce and therefore influence its agricultural production potential. These factors include its location surrounded largely by non-agricultural land uses, the lack of any existing cropping infrastructure or inputs, which would therefore necessitate agricultural investment for crop production, and the small size of the property, which prevents economies of scale. As a result of all the constraints, the site is unsuitable for viable crop production and its agricultural land use is limited to grazing only.

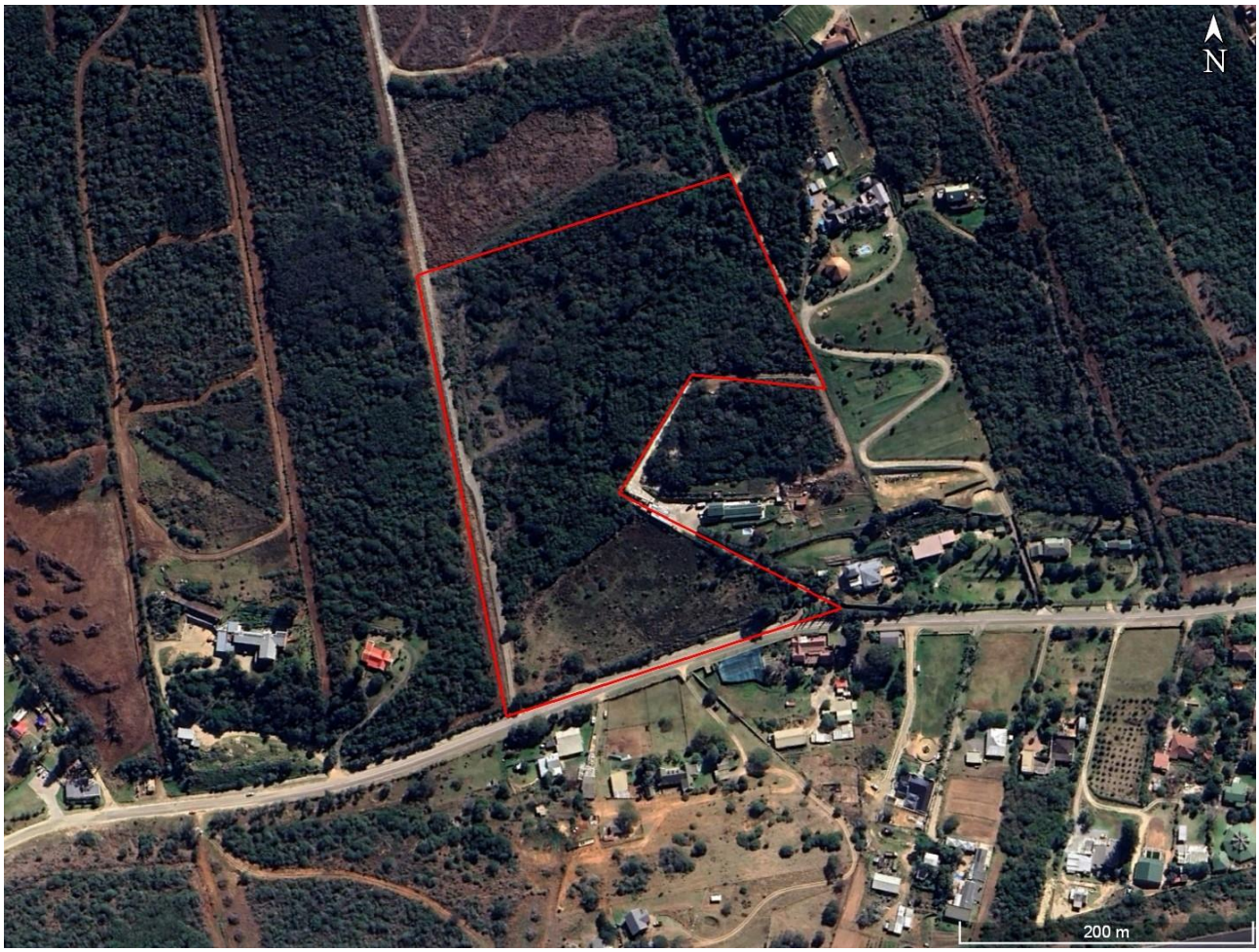

Figure 3. *Satellite image map of the development site.*

9 ASSESSMENT OF THE AGRICULTURAL IMPACT

An agricultural impact is a change to the future agricultural production potential of land. By far the most important agricultural impact of most developments, including the one being assessed here, is a loss of agricultural land due to a change in land use. The significance of the agricultural impact is a direct function of the following three factors:

1. the total footprint of land that will be lost
2. the baseline production potential (particularly cropping potential) of the land that will be lost
3. the length of time for which the land will be lost to agriculture

The most significant agricultural impact possible, ignoring the length of time component, is therefore a loss of a large area of high yielding cropland and the least significant impact is a loss of a small area of low carrying capacity grazing land.

The threshold above which it is a priority to conserve land for agricultural production is determined by the scarcity of arable crop production land in South Africa and the relative abundance of land that is only good enough to be used for grazing. If land can support viable and sustainable crop production, then it is considered to be above the threshold and is a priority for being conserved as agricultural production land. If land is unable to support viable and sustainable crop production, then it is considered to be below the threshold and of much lower priority for being conserved.

In this case, the total footprint of land that will be lost is only 6 hectares. It is not used for agricultural production and its potential is limited to only being suitable as grazing land. The loss of 6 hectares of potential grazing land, of which there is no particular scarcity in the country, represents minimal loss of agricultural production potential. Due to the limited loss of agricultural production potential, the agricultural impact of the development is assessed here as being of low significance.

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 conservation of agricultural land that is in proximity to urban areas is under inevitable pressure from various non-agricultural land uses including urban expansion. The cumulative impact of agricultural land loss close to urban centres in the Western Cape is significant. However the agricultural priority should be to conserve future agricultural production, not simply agriculturally zoned land. As has been shown above, the site has no current agricultural production and limited capacity for future agricultural production. Therefore it is a property to which inevitable urban expansion can be steered without a high loss of agricultural production potential. The cumulative agricultural impact of the proposed development is therefore assessed here as being of low significance and therefore as acceptable.

Specialist assessments for environmental authorisation are also required to assess the impact of the no-go alternative. The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. There are no agricultural impacts of

the no-go alternative. Even though the impacted land has low agricultural production potential, and the impact of the development is low, its negative agricultural impact is slightly more significant than that of the no-go alternative, and so from an agricultural impact perspective, the no-go alternative is the preferred alternative.

No mitigation measures are required for the protection of agricultural production potential on the site because the entire site will be excluded from agricultural land use.

10 CONCLUSION: AGRICULTURAL COMPLIANCE STATEMENT

The cropping potential of the site is limited by the combination of climate, terrain, and soil constraints. Slopes are steep. The soils on site are limited by shallow depths and low water and nutrient holding capacity. Furthermore, other factors other than climate, terrain, and soil capability also constrain the potential of the property to practically deliver agricultural produce and therefore influence its agricultural production potential. These factors include its location surrounded largely by non-agricultural land uses, the lack of any existing cropping infrastructure or inputs, which would therefore necessitate agricultural investment for crop production, and the small size of the property, which prevents economies of scale. As a result of all the constraints, the site is unsuitable for viable crop production and its agricultural land use is limited to grazing only.

The screening tool rating of the agricultural sensitivity of the assessment area is confirmed and is verified in this assessment as being of low to medium agricultural sensitivity.

An agricultural impact is a temporary or permanent change to the future agricultural production potential of land. By far the most important agricultural impact is a loss of agricultural land due to a change in land use. The significance of the agricultural impact is directly proportional to the extent of the change in production potential, which is a function of:

1. the total footprint of land that will be lost
2. the baseline production potential (particularly cropping potential) of the land that will be lost
3. the length of time for which the land will be lost to agriculture

In this case, the total footprint of land that will be lost is only 6 hectares. It is not used for agricultural production and its potential is limited to only being suitable as grazing land. The loss of 6 hectares of potential grazing land, of which there is no particular scarcity in the country, represents minimal loss of agricultural production potential. Due to the limited loss of agricultural production potential, the agricultural impact of the development is assessed here as being of low significance.

Although the development will occupy land that is currently zoned for agriculture, it will lead to minimal loss of both current production and of future agricultural production potential. The agricultural impact of the proposed development is assessed 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.

11 REFERENCES

Crop Estimates Consortium, 2019. *Field Crop Boundary data layer, 2019*. Pretoria. Department of Agriculture, Forestry and Fisheries.

Department of Agriculture Forestry and Fisheries, 2018. Long-term grazing capacity map for South Africa developed in line with the provisions of Regulation 10 of the Conservation of Agricultural Resources Act, Act no 43 of 1983 (CARA), available on Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

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

Department of Agriculture, Forestry and Fisheries, 2002. National land type inventories data set. Pretoria.

Department of Agriculture, Land Reform and Rural Development. 2020. Protected agricultural areas – Spatial data layer. 2020. Pretoria.

Schulze, R.E. 2009. SA Atlas of Climatology and Agrohydrology, 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 Consultors International (Tinie du Preez)** **1998 - 2001**

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist **De Beers Namaqualand Mines** **July 1997 - Jan 1998**

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine.*

I am a reviewing scientist for the *South African Journal of Plant and Soil*.

APPENDIX 2: DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I, **Johann Lanz**, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - ~~am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist: 

Date: **6 June 2023**

Name of company: **Johann Lanz – soil scientist (sole proprietor)**

SACNASP

South African Council for Natural Scientific Professions

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 fields(s) of practice (Schedule 1 of the Act)

Soil Science (Professional Natural Scientist)

Effective **15 August 2012** Expires **31 March 2024**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

APPENDIX 4: SOIL DATA

Table of land type soil data

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Dc28	T					20.0
Dc28	Va	200 - 300	15 - 25	40 - 65	vp	14.3
Dc28	Ss	300 - 400	4 - 12	35 - 60	pr	13.0
Dc28	Va	200 - 350	15 - 20	35 - 55	vr	12.8
Dc28	Sd	400 - 700	15 - 25	30 - 50	R	11.5
Dc28	Hu	> 1200	8 - 15	10 - 30		9.5
Dc28	Va	200 - 350	15 - 20	35 - 55	vp	8.5
Dc28	Es	400 - 500	4 - 12	35 - 60	pr	5.8
Dc28	Oa	> 1200	3 - 6	3 - 12		2.3
Dc28	Du	> 1200	6 - 10			1.5
Dc28	We	400 - 500	8 - 15	15 - 35	sp	1.0
Hb62	Fw	> 1200	2 - 6			59.5
Hb62	Ms	100 - 250	2 - 6		ka	13.3
Hb62	Sp	> 1200	2 - 6	4 - 10		7.2
Hb62	Fw	> 1200	2 - 6			4.0
Hb62	Oa	> 1200	2 - 6	3 - 12		3.0
Hb62	We	200 - 400	3 - 6	3 - 10	sp	3.0
Hb62	Du	> 1200	2 - 6			3.0
Hb62	Vf	> 1200	2 - 6	4 - 10		2.7
Hb62	R					2.0
Hb62	Cv	> 1200	2 - 6	2 - 6		1.5
Hb62	Oa	> 1200	3 - 6	4 - 10		1.0