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Site sensitivity verification

and Agricultural Compliance Statement

for a proposed cemetery

on Erf number 5662, Moorreesburg, Western Cape Province

Report by

Johann Lanz

23 May 2023

Contents

1 Introduction

Environmental and zoning authorisation is being sought for the establishment of a cemetery near Moorreesburg in the 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 small site and straightforward nature of the assessment, the appropriate level of agricultural assessment is an Agricultural Compliance Statement.

Johann Lanz was appointed as an independent agricultural specialist to conduct the agricultural assessment. The objective and focus of an agricultural assessment are to assess whether the agricultural impact of the proposed development will be acceptable, and based on this, to make a recommendation on whether it should be approved.

Figure 1. *The locality of the proposed cemetery (blue outline), north of the town of Moorreesburg.*

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.

2 Project description

The proposed project is a cemetery. The project will cause the exclusion of potential agricultural production from the entire site. Once agriculture is excluded from the site, 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 site to future agricultural production.

3 Terms of reference

The terms of reference for this study are to fulfil 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:
   - 2.1 Be applicable to the preferred site and proposed development footprint (**Figures 2 and 3**),
   - 2.2 Confirm that the site is of “low” or “medium” sensitivity for agriculture (**Section 7**), and
   - 2.3 Indicate whether 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:
   - 3.1 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**),
   - 3.2 A signed statement of independence by the specialist (**Appendix 2**),
   - 3.3 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**),
   - 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 (**not applicable**),
   - 3.5 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**),

3.6 Any conditions to which this statement is subjected (**Section 10**),

3.7 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**),

3.8 Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (**not required**), and

3.9 A description of the assumptions made and any uncertainties or gaps in knowledge or data (**Section 5**).

4 Methodology

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, land cover, grazing and certain other data.
- Land Cover data was sourced form: Land Cover 73-class (DEA, 2020), available on Cape Farm Mapper.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- 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

A cemetery requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) if it is on agriculturally zoned land. The required approval is a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. The application for approval 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 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 – whether the land is cropland or not, and what its land capability rating is. Land capability is rated by the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. It is usable on a scale of 1:50 000 to 1:100 000 and is not therefore accurate at a farm scale. Land capability is defined as the combination of soil, climate, and terrain suitability factors for supporting rain-fed agricultural production. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land. 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 to 5	Low
6 to 8	Medium
9 to 10	High
11 to 15	Very High

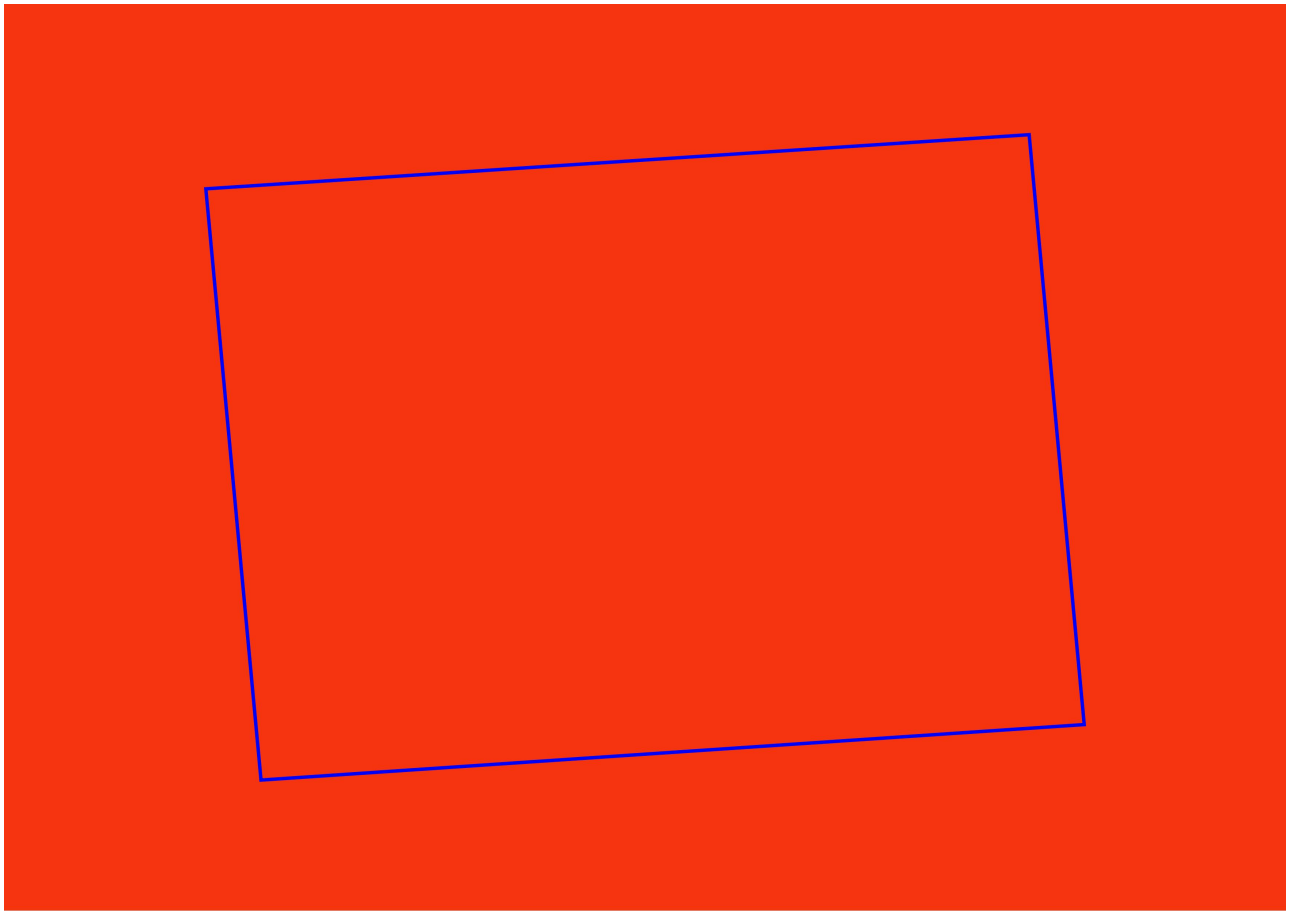

Figure 2 *- The footprint of the proposed development (blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).*

The classification of the site as high agricultural sensitivity by the screening tool (red in Figure 2) is because the entire site is classified as cropland in the data set used by the screening tool. This assessment verifies the land use as cropland and therefore verifies the site as being of high agricultural sensitivity.

8 Baseline description of the agro-ecosystem

The purpose of this section of the report is to present the baseline information that controls the agricultural production potential of the site so that an assessment of that potential can be made. Agricultural production potential is one of the main factors that determines the significance of the agricultural impact. All the important parameters that control the agricultural production potential of the site are given in Table 2.

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

Type	Parameter	Value
Climate	Köppen-Geiger climate classification	Csa
	Köppen-Geiger climate description	Temperate, dry summer, hot summer
	Mean Annual Rainfall (mm)	355
	Reference Crop Evaporation Annual Total (mm)	1343
	Climate capability classification (out of 9)	5 (moderate)
Terrain	Terrain type	Low, hilly terrain of the Swartland
	Slope gradients (%)	4
	Altitude (m)	178
	Terrain capability classification (out of 9)	7 (high)
Soil	Geology	Klipplaat formation; quartz-sericite-chlorite schist, phylite
	Land type	Ab24
	Description of land type soils	Predominantly moderately deep to deep, medium, textured, red, well drained soils on underlying rock, but also includes shallow soils on underlying rock.
	Dominant soil forms	Hutton. Swartland, Glenrosa
	Soil capability classification (out of 9)	5 (moderate)
Land use	Agricultural land use in the surrounding area	cropland
	Agricultural land use on the site	cropland
	Land Cover classification on the site	commercial annual crops; rain-fed / dryland
General	Long-term grazing capacity (hectares per Large Stock Unit)	36 (moderate to high)
	Land capability classification (out of 15)	8 (moderate)
	Within Protected Agricultural Area	Yes

A satellite image map of the site is given in Figure 3.

Figure 3 *- Satellite image of site*

The site falls within 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.

8.1 Assessment of 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.

Despite some potential climate and soil limitations, the site is of high enough agricultural potential that it is suitable and used for viable rain-fed field crop production of small grains.

9 Assessment of agricultural impact

An agricultural impact is a temporary or permanent change to the future agricultural production potential of land. The significance of an agricultural impact is directly proportional to the extent of the change in production potential, which in turn, when it involves a loss of agricultural land to development, as it does in this case, is a function of two things: the amount of land that will be lost and the production potential of the land that will be lost.

In this case, there is a permanent loss of 5 hectares of agricultural land. The production potential of that land is sufficient to be viable for crop production. The loss of cropland, of which there is a scarcity in the country, represents some loss of agricultural production potential, both for the affected farmer and in terms of national food security. Due to the size of the loss, and the agricultural production potential of the land, the agricultural impact is assessed here as being of medium 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 cumulative impact of agricultural land loss from urban expansion around towns in the Western Cape is significant. This development will contribute to that cumulative loss.

The impact however needs to be weighed against the need and desirability of the cemetery and that weighing needs to recognise that the site is in close proximity to the town in an area that has already been divided up into small land parcels that are no longer of sufficient size to be individually viable as agricultural production land.

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 and it is therefore the preferred alternative from an agricultural impact perspective.

10 Conclusion: Agricultural Compliance Statement

The site is classified as high agricultural sensitivity by the screening tool. This has been confirmed by this assessment, because of the agricultural production potential and current agricultural land use, and the site is verified by this assessment as being of high agricultural sensitivity.

An agricultural impact is a temporary or permanent change to the future agricultural production potential of land. The significance of an agricultural impact is directly proportional to the extent of the change in production potential, which in turn, when it

involves a loss of agricultural land to development, as it does in this case, is a function of two things: the amount of land that will be lost and the production potential of the land that will be lost.

In this case, there is a permanent loss of 5 hectares of agricultural land. The production potential of that land is sufficient to be viable for crop production. The loss of cropland, of which there is a scarcity in the country, represents some loss of agricultural production potential, both for the affected farmer and in terms of national food security. Due to the size of the loss, and the agricultural production potential of the land, the agricultural impact is assessed here as being of medium significance. Furthermore, this development contributes to the cumulative impact of agricultural land loss from urban expansion around towns in the Western Cape.

The impact however needs to be weighed against the need and desirability of the cemetery and that weighing needs to recognise that the site is in close proximity to the town in an area that has already been divided up into small land parcels that are no longer of sufficient size to be individually viable as agricultural production land. Within this context, the agricultural impact of the development can be deemed acceptable and it can be recommended that the development be approved.

The protocol requirement of confirmation that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities, is not relevant in this case. There are also no Environmental Management Programme inputs required for the protection of agricultural potential on the site.

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.

J. Lanz (Pr. Sci.Nat.)

23 May 2023

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: **23 May 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
Ab24	Hutton	600 - 1200	15 - 25	20 - 40	R	47.5
Ab24	Glenrosa	200 - 300	6 - 20		so	17.1
Ab24	Mispah	150 - 300	6 - 15		R	8.8
Ab24	Swartland	300 - 500	15 - 25	35 - 45	vr	7.2
Ab24	Swartland	300 - 500	15 - 25	35 - 45	vp	7.1
Ab24	Swartland	400 - 600	15 - 25	25 - 40	vr	5.1
Ab24	Clovelly	600 - 800	15 - 25	25 - 35	R	3.3
Ab24	Valsrivier	300 - 500	15 - 25	35 - 45	vp	2.5
Ab24	Oakleaf	> 1200	15 - 25	15 - 35		0.9
Ab24	Rock outcrop					0.5
Ab24	Mispah	100 - 300	6 - 15		R	0.3