



SCOPING PHASE REPORT

SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL SURVEY:

PROPOSED PROJECT BLUE WIND ENERGY FACILITY, NORTH OF KLEINSEE, NORTHERN CAPE PROVINCE

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DECLARATION

I, Johan Hilgard van der Waals, declare that I –

- 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 71 and is punishable in terms of Section 24F of the Act.

J.H. VAN DER WAALS
TERRA SOIL SCIENCE

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SCOPING PHASE SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL SURVEY – PROPOSED PROJECT BLUE WIND ENERGY FACILITY, NORTH OF KLEINSEE, NORTHERN CAPE PROVINCE

1. TERMS OF REFERENCE

Terra Soil Science (TSS) was commissioned by Savannah Environmental (Pty) Ltd to undertake a scoping level soil, land use, land capability and agricultural potential survey for the proposed Project Blue Wind Energy Facility near Kleinsee in the Northern Cape Province.

2. INTRODUCTION

A scoping level soil, land use, land capability and agricultural potential survey was conducted for the proposed Project Blue Wind Energy Facility near Kleinsee in the Northern Cape Province.

3. DESCRIPTION OF THE SURVEY AREA

3.1 Survey Area Boundary

The survey area lies between 29° 32' 33" and 29° 39' 27" south and 17° 01' 47" and 17° 12' 14" east approximately 5 km north of the mining town of Kleinsee in the Northern Cape Province (**Figure 1**).

3.2 Survey Area Physical Features

The survey area lies on undulating and hilly terrain with a distinct "ridge" that forms the western boundary of the site. This is not the highest part of the site and the altitude varies between 80 and 220 m above mean sea level. The geology is aeolian material overlying Tertiary and Quaternary marine sediments.

4. SOIL, LAND CAPABILITY, LAND USE SURVEY AND AGRICULTURAL POTENTIAL SURVEY

4.1 Method of Soil, Land Capability, Land Use Survey and Agricultural Potential Survey

The scoping soil, land capability, land use and agricultural potential surveys were conducted in two phases.

4.1.1 Phase 1: Land Type Data

Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC). The land type data is presented at a scale of 1:250 000 and entails the division of land into land types, typical terrain cross sections for the land type and the presentation of dominant soil types for each of the identified terrain units (in the cross section). The soil data is classified according to the Binomial System (MacVicar et al., 1977). The soil data was interpreted and re-classified according to the Taxonomic System (MacVicar, C.N. et al. 1991).

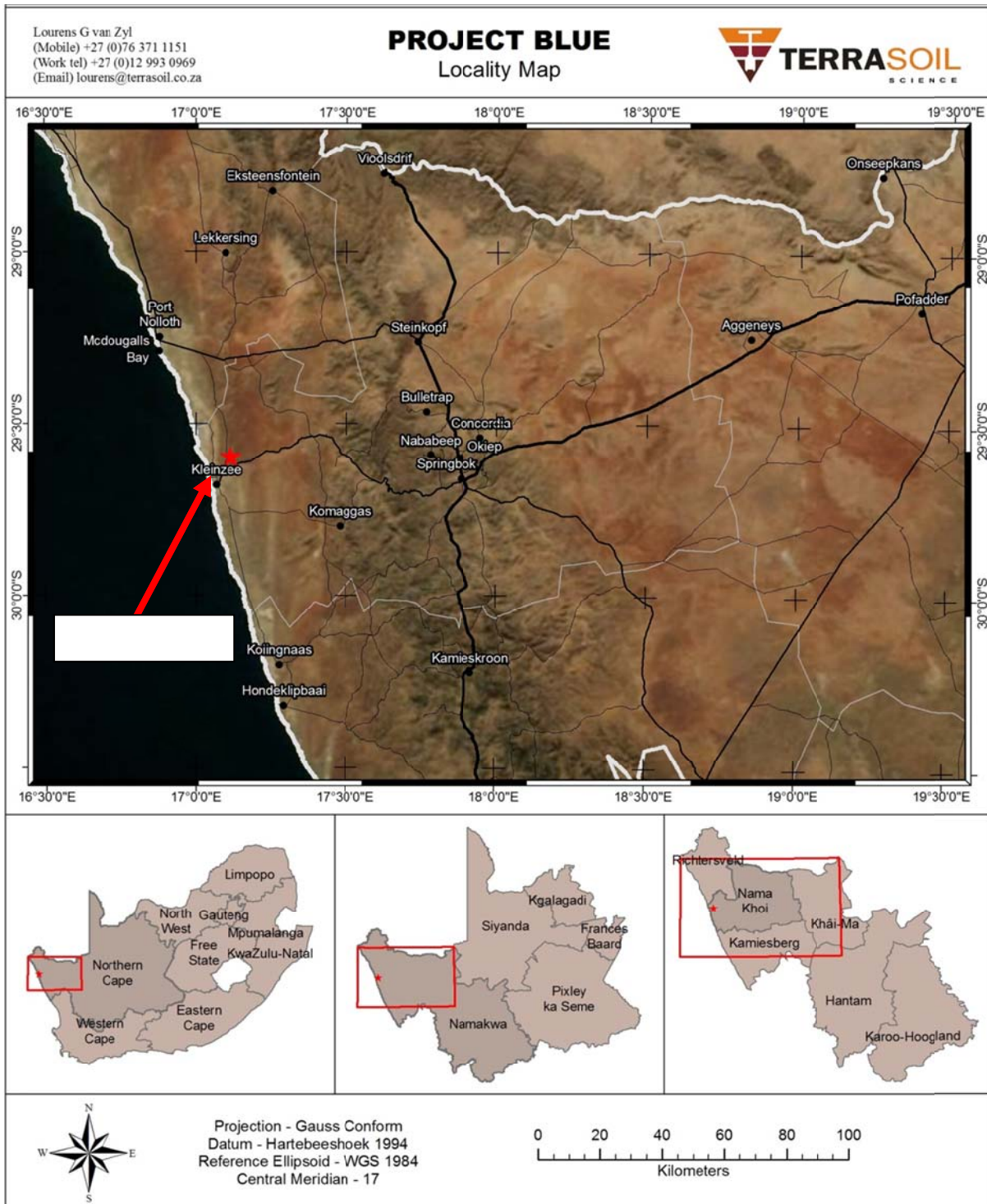


Figure 1 Locality of the survey site

4.1.2 Phase 2: Aerial Photograph Interpretation and Land Use Mapping

The most up to date aerial photographs of the site were obtained from Google Earth. The image was used to interpret aspects such as land use and land cover as well as historic land uses such as mining.

4.2 Soil, Land Capability, Land Use and Agricultural Potential Survey Results

4.2.1 Phase 1: Land Type Data

The site falls into the **Af17** land type (Land Type Survey Staff, 1972 - 2006). (Refer to **Figure 2** for the land type map of the area). Below follows a brief description of the land type in terms of soils, land capability, land use and agricultural potential.

Land Types Af17

Soils: Mainly eutrophic and lime containing red deep sandy soils with limited occurrences of yellow brown and bleached soils. Rock outcrops occur occasionally, especially in valley bottom positions.

Land capability and land use: Exclusively extensive grazing and wilderness area due to severe climate constraints (This description relates to the land type which is broader than the site – refer to the map). Soil erosion is a risk due to low vegetation cover and the occasional heavy rainfall event.

Agricultural potential: Very low potential due to the low rainfall (less than 100 mm per year – **Figure 3**).

4.2.2 Phase 2: Aerial Photograph Interpretation and Land Use/Capability Mapping

The interpretation of the Google Earth image yielded two potential land uses of which extensive grazing is the dominant one (**Figure 4**). Mining activities is the other one but is much more prominent to the west of the site. The land capability of the site can be considered to be “wilderness” as the grazing capacity is low enough that only natural land uses and low intensity grazing make sense.

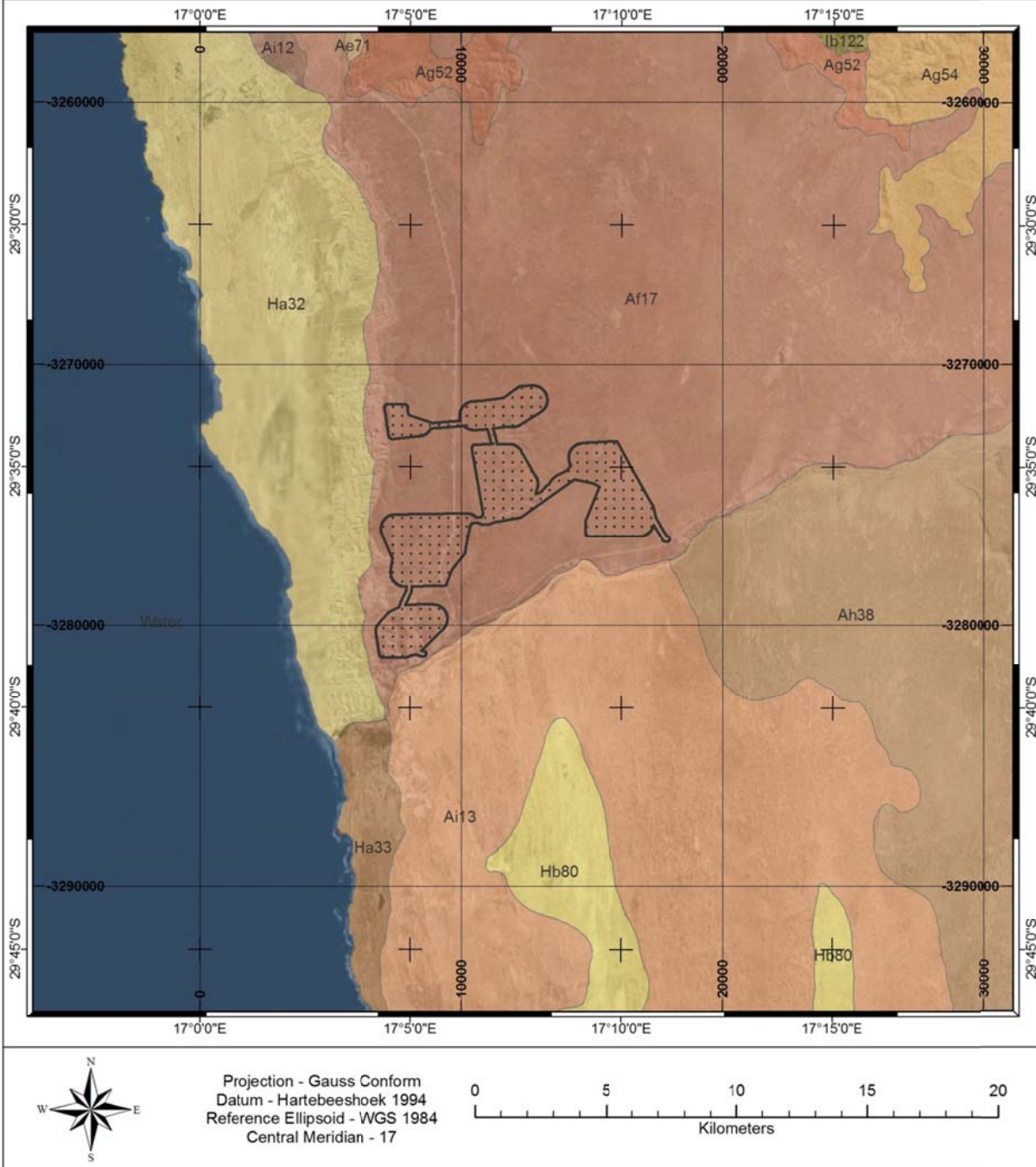


Figure 2 Land type map of the survey site

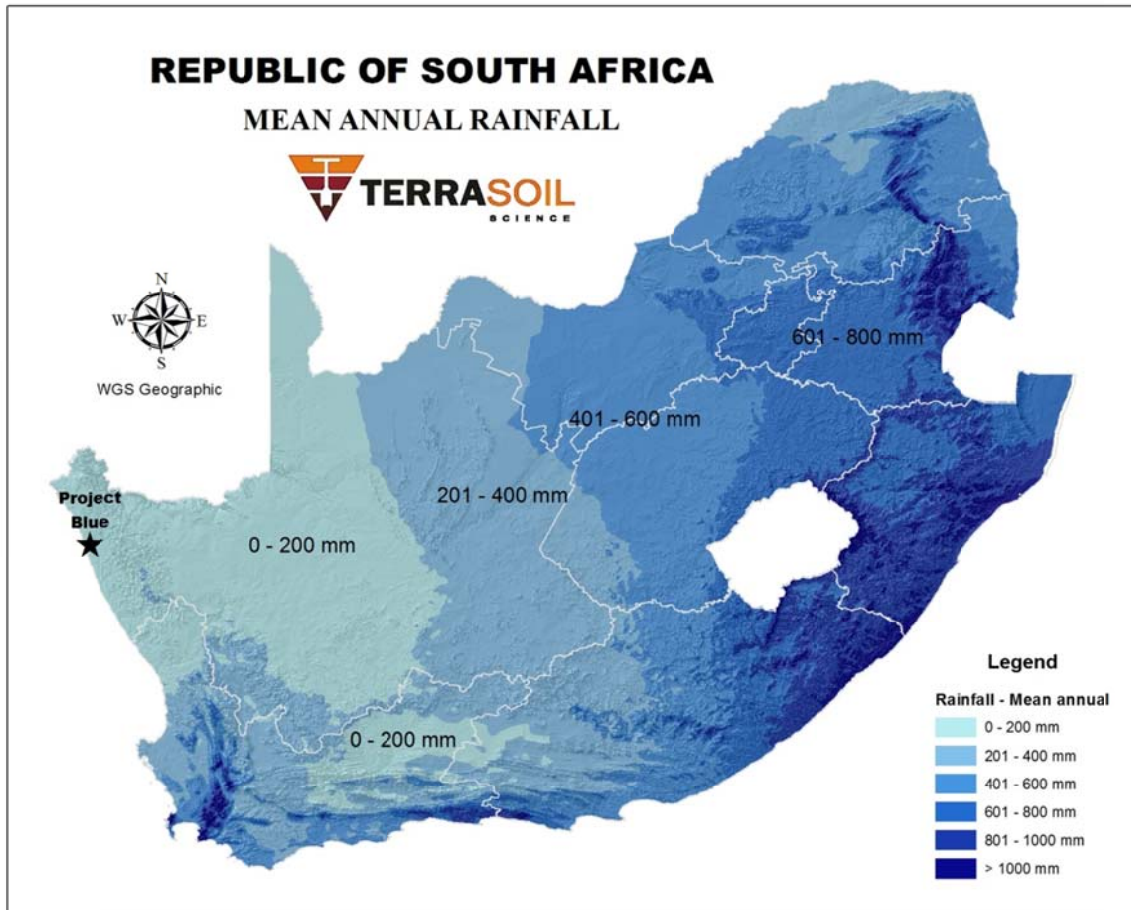


Figure 3 Rainfall map of South Africa indicating the survey site

5. INTERPRETATION OF SOIL, LAND CAPABILITY AND LAND USE SURVEY RESULTS

The interpretation of the land use and land capability results yielded a number of aspects that are of importance to the project.

5.1 Agricultural Potential

The agricultural potential of the site is very low and limited to extensive grazing due to the low rainfall. The potential use of the site is limited to grazing by sheep and, with the rainfall of the area, it is considered to be unsuitable for cattle grazing. Other agricultural practices, such as crop production, are not considered to be viable as such practices would require water which is not available in the area (water is piped in from other areas for human and mining use).

5.2 Overall Soil Impacts

The overall impacts of the proposed wind energy facility on agriculture will be low due to the very low agricultural potential of the site. Due to the low rainfall, impacts on the soils such as

erosion and dust generation are considered more problematic and will have to be addressed in more detail in the EIA phase of the process. There is no preference for the placement of the turbines from a land use perspective as there are no significantly sensitive areas. The sensitivity of the site from other biophysical perspectives should be considered when deciding on the turbine positions.



Figure 4 Land use on the survey site

6. ANTICIPATED SOIL / LAND USE / AGRICULTURE IMPACTS

The following impacts are expected for the proposed development:

6.1 Physical Soil Disturbance Due To Construction Activities

Nature of Impact: Direct impacts are associated with the soils along the constructed roads as well as on the turbine construction sites. Indirect impacts could arise in the form of soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads, construction sites and turbine footprints. Cumulative impacts are only considered to be problematic if the aforementioned storm water management is not instituted.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the classification of the soils. These parameters will provide an indication to the project engineers regarding the erosion risk as well as inform the mitigation measures to be implemented on the site.

6.2 Impacts on Current Land Use Due To Construction Activities

The current land use is limited to extensive grazing.

Nature of Impact: Direct impacts are associated with the constructed roads as well as the turbine construction sites. Indirect impacts could arise in the form of land use changes due to soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads, construction sites and turbine footprints. Cumulative impacts are only considered to be problematic if the aforementioned storm water management is not instituted. Otherwise very limited cumulative impacts are expected due to the low intensity land uses practiced on the site.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of natural soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the determination of, in a broad sense, the carrying capacity of the site in general and specific sections of the site.

6.3 Impacts on Agricultural Potential Due To Construction Activities

The agriculture potential of the site is low due to a range of biophysical constraints.

Nature of Impact: Direct impacts are considered to be small due to the low agricultural potential. Significant indirect and/or cumulative impacts are considered to be improbable due to the low potential of the site.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled. The impacts are considered to be low due to the low agricultural baseline of the site.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of natural soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the determination of the agricultural potential of the soils as well as the probability that they will be impacted.

7. CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development of a wind energy facility on the site will not have large impacts on the current land use of the area. This is mainly due to the low agricultural potential, dominant soils and climatic constraints for the site. Long-term detrimental impacts are not expected but adequate mitigation and management measures have to be put in place. The main aspects that will have to be managed on the site include erosion and dust generation during the construction process.

The impacts on the site need to be viewed in relation to the opencast mining of coal in areas of high potential soils – such as the Eastern Highveld. With this comparison in mind the impact of a wind energy facility is negligible compared to the damaging impacts of coal mining – for a similar energy output. Therefore, in perspective, the impacts of the proposed facility can be motivated as necessary in decreasing the impacts in areas where agriculture potential plays a more significant role.

A detailed site visit will have to be conducted as part of the EIA level investigation and the following parameters should be investigated:

- » Soil distribution (classification) on the site;
- » Extent of degradation due to current land use (such as overgrazing and mining);
- » Erosion status and erodibility of the soils on the site; and
- » Mitigation measures to arrest current impacts and manage future impacts associated with the development.

8. LIMITATIONS / GAPS IN KNOWLEDGE

The following limitations, or gaps in knowledge, exist for the proposed activity on the site

- » Soil distribution (classification) on the site (to be generated during the EIA phase);
- » Extent of degradation due to current land use (to be generated during the EIA phase);
- » Erosion status and erodibility of the soils on the site (to be generated during the EIA phase); and
- » Design specifications and layout of proposed development. This detail will guide the specific impacts to be assessed as well as the proposed mitigation measures.

REFERENCES

LAND TYPE SURVEY STAFF. (1972 – 2006). *Land Types of South Africa: Digital map (1:250 000 scale) and soil inventory databases*. ARC-Institute for Soil, Climate and Water, Pretoria.

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