SCOPING PHASE REPORT

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

PROPOSED WALKER BAY WIND ENERGY FACILITY IN THE WESTERN CAPE PROVINCE

September 22nd, 2011

Compiled by:
J.H. van der Waals
(PhD Soil Science, Pr.Sci.Nat)
Member of:
Soil Science Society of South Africa (SSSSA)
Soil Science Society of America (SSSA)

Accredited member of:
South African Soil Surveyors Organisation (SASSO)

Registered with:
The South African Council for Natural Scientific Professions
Registration number: 400106/08

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

Table of Contents

SCOPING PHASE SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL SURVEY – PROPOSED WALKER BAY WIND ENERGY FACILITY IN THE WESTERN 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 Walker Bay Wind Energy Facility in the Western Cape Province.

2. INTRODUCTION

A scoping level soil, land use, land capability, and agricultural potential survey was conducted for the proposed Walker Bay Wind Energy Facility in the Western Cape Province.

3. DESCRIPTION OF THE SURVEY AREA

3.1 Survey Area Boundary

The survey area (i.e. the project development site) lies between 34° 29' 17'' and 34° 30' 44'' south and 19° 31' 11'' and 19° 32' 58'' east approximately 10 km southeast of the town of Stanford in the Western Cape Province (**Figure 1**).

3.2 Survey Area Physical Features

The survey area lies on largely hilly to mountainous terrain with numerous valleys, ridges and spurs. The altitude varies between 200 and 390 m above mean sea level. The geology of the site is dominated by quartzitic sandstone leading to the dominance of sandy soils.

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).

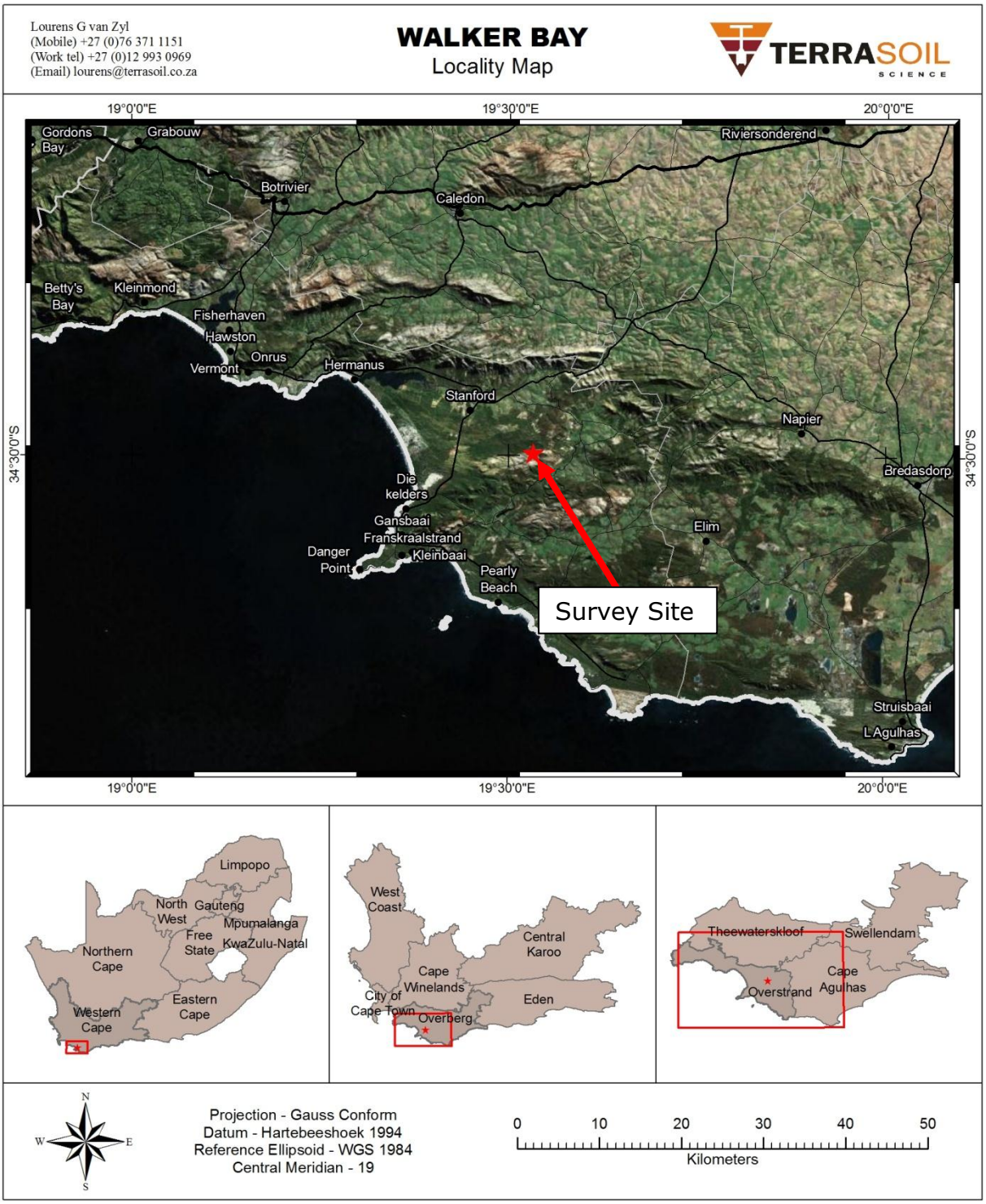

Figure 1 Locality of the survey site

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 cultivation.

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 **Fa666** 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 Fa666

Soils: Predominantly shallow and rocky sandy soils in all landscape positions except valley bottoms where deeper sandy soils occur. Limited distribution of duplex soils occurs in footslope positions. Podzols occur throughout the landscape.

Land capability and land use: Predominantly wilderness area due to the sandy and rocky soils as well as the dominance of fynbos vegetation on the site.

Agricultural potential: Very low potential due to the inherent soil restrictions even though the rainfall is adequate for limited crop production (**Figure 3**).

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

The interpretation of the Google Earth image yielded one land use (i.e. land capability class) namely wilderness area or natural land uses (**Figure 4**). Due to the nature of the vegetation the site is not suitable for extensive cattle or sheep production. It is also evident from the satellite image that a drainage feature exists on the site – draining towards the north-northwest (**Figures 5** and **6**). This feature could have wetlands and seepage areas associated with it and the presence of such features should be investigated (and confirmed) during the EIA phase investigation.

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.

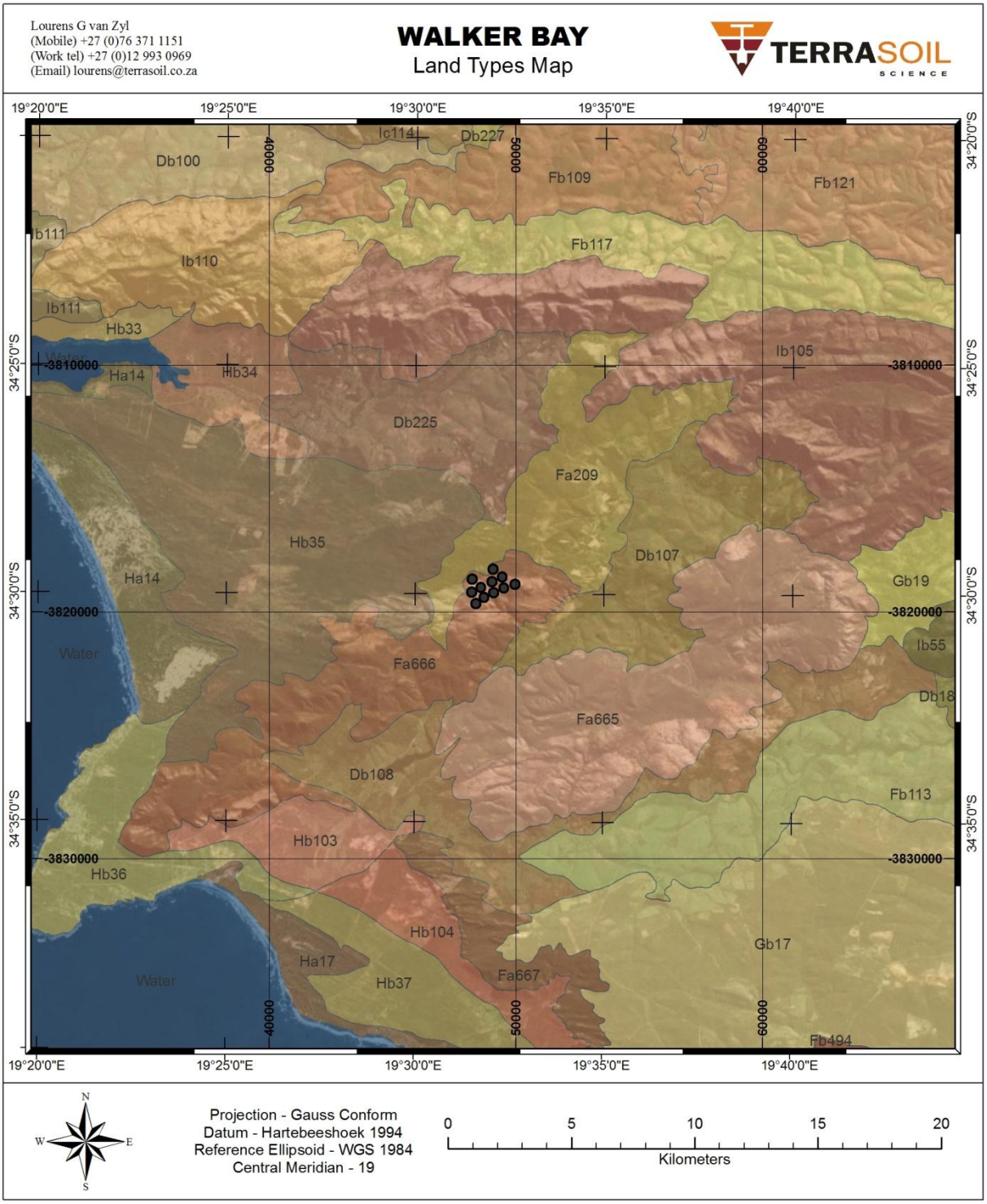

Figure 2 Land type map of the survey site

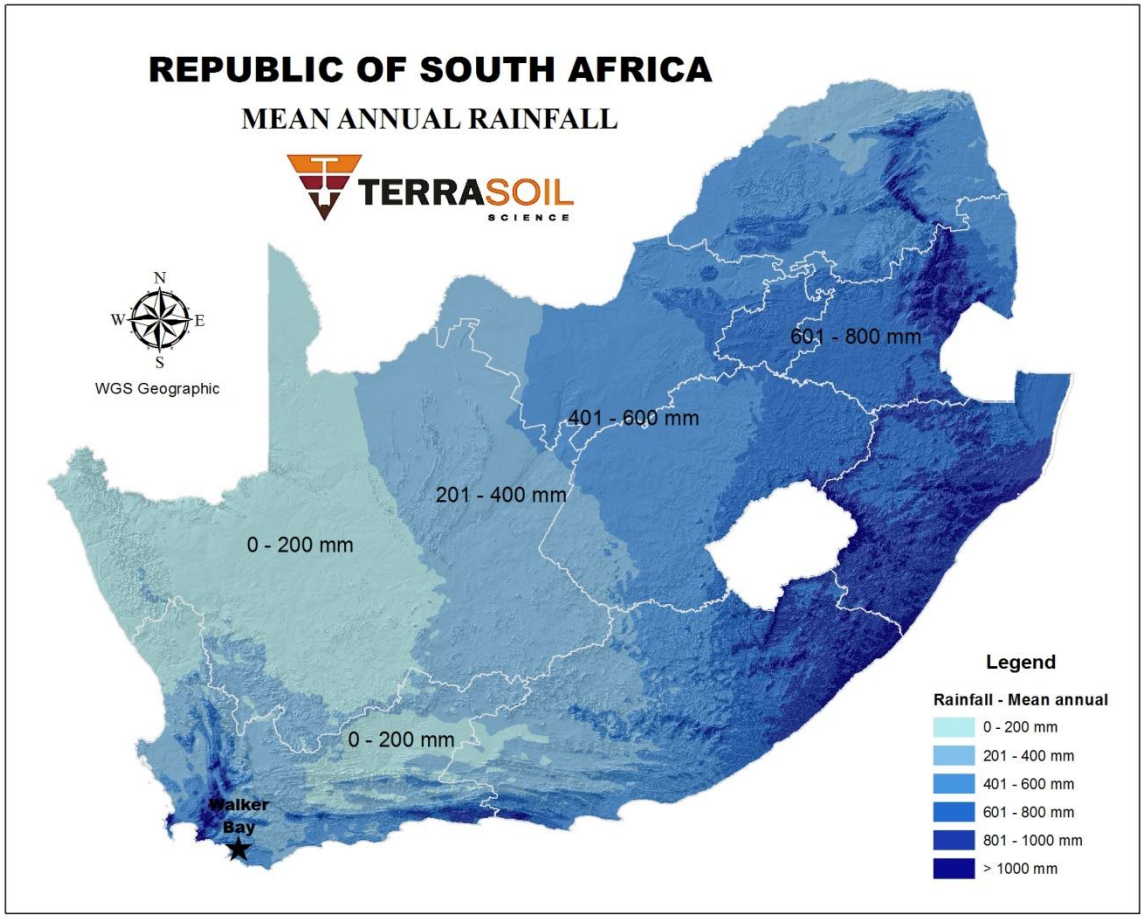

Figure 3 Rainfall map of South Africa indicating the survey site

5.1 Agricultural Potential

The agricultural potential of the site is very low due to the dominance of shallow and rocky soils. In the general area apple production takes place but the site is considered unsuitable for such activities due to its exposed nature as well as topographic characteristics. The production of timber is considered non-viable for the same reasons and will impact negatively on the high vegetation diversity.

5.2 Overall Soil Impacts

The overall impacts of the proposed wind energy facility on agriculture will be low due to the low agricultural potential of the site. Due to the nature of the site soil erosion is considered to be the main development related impact of concern. The shallow and rocky soils provide an opportunity to mitigate such impacts but then only with proper planning and implementation.

Figure 4 Land use on the survey site

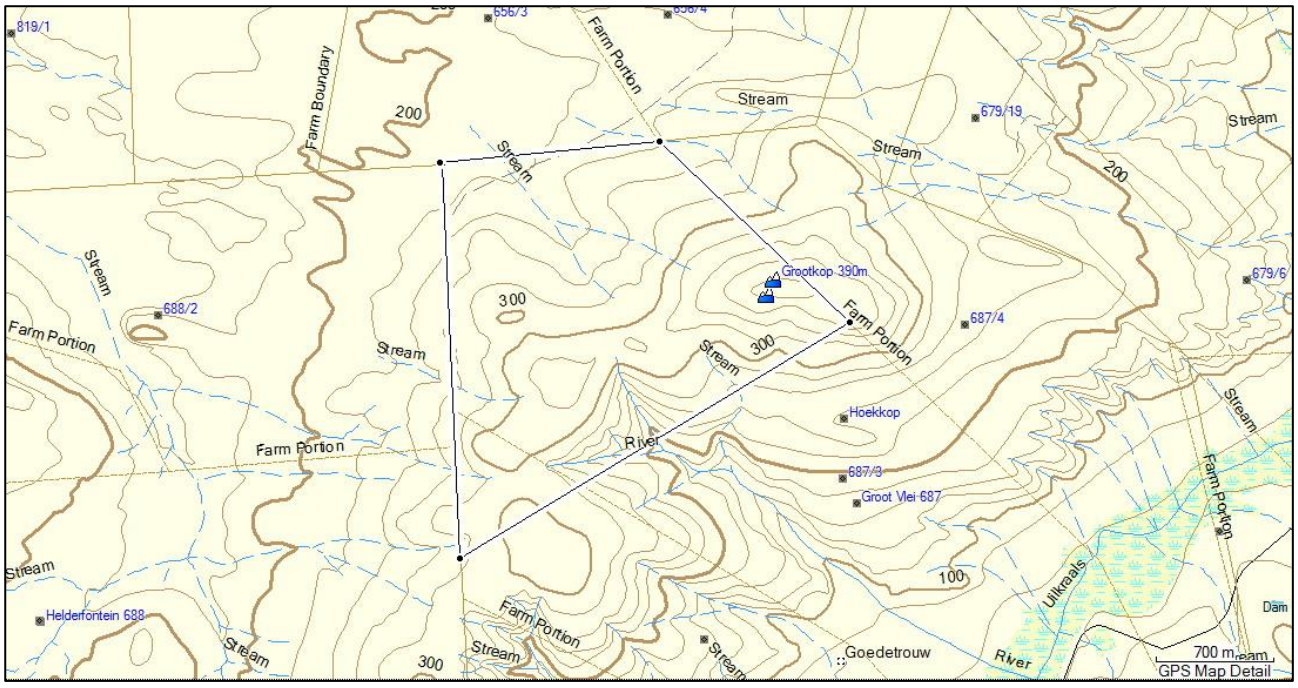

Figure 5 Topographic features on the site including the drainage feature

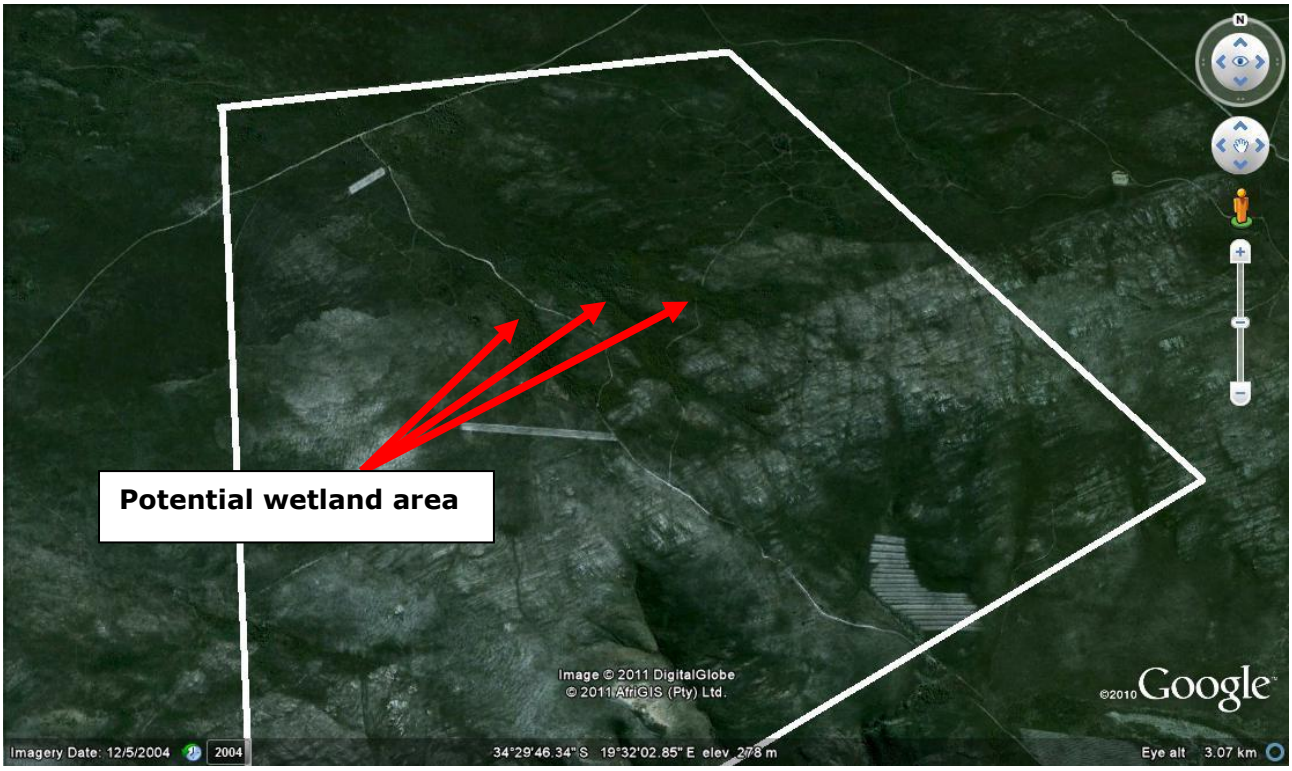

Figure 6 Google image of the site on which the drainage feature and potential wetlands are evident

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. Otherwise very limited cumulative impacts are expected due to the shallow nature of the soils.
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 high as the sediment generated on site could influence other areas of natural vegetation which have a high conservation status.
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 as well as assessment of slopes. 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 natural uses (conservation?).

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 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. Impacts associated with irrigated agriculture should be avoided.
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 high as the sediment generated on site could influence other areas of natural vegetation which have a high conservation status.
Potentially Significant Impacts to be assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be the extent to which conservation of the natural vegetation in the areas will be impacted by the development footprint.

6.3 Impacts on Agricultural Potential due to Construction Activities

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

Nature of Impact: Direct impacts are considered small due to the low agricultural potential. Significant indirect and/or cumulative impacts are considered improbable due to the low potential on the bulk 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 low due to the low agricultural baseline of the site.
Potential Significance of Identified Impacts: The potential significance of the identified impacts is high as the sediment generated on site could influence other areas of natural vegetation which have a high conservation status.
Potentially Significant Impacts to be assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be the extent to which conservation of the natural vegetation in the areas will be impacted by the development footprint.

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 save for impacts on the conservation of natural vegetation. The positioning of the turbines could be influenced due to the presence of a distinct drainage feature and potentially associated wetlands. These aspects should be investigated in detail during the EIA phase. Long-term detrimental impacts are not expected but adequate mitigation and management measures have to be put in place. The main aspect that will have to be managed on the site is erosion during the construction process as well as potential wetland / water course impacts.

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;
» Distribution and extent of wetlands and water courses on the site;
» Erosion status and erodibility of the soils on the site; and
» Mitigation measures to arrest 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);
» Distribution and extent of wetlands and water courses on the site (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.

MACVICAR, C.N. et al. 1977. *Soil Classification. A binomial system for South Africa.* Sci. Bull. 390. Dep. Agric. Tech. Serv., Repub. S. Afr., Pretoria.

MACVICAR, C.N. et al. 1991. *Soil Classification. A taxonomic system for South Africa. Mem. Agric. Nat. Resour. S.Afr.* No.15. Pretoria.