

Methodologies for Ground Truthing

Farm 1341 Master Development Potential Plan

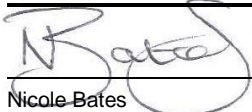
Drakenstein Municipality

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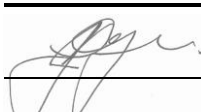
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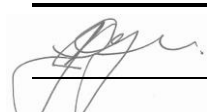


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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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1. Introduction

The following document serves to inform the relevant authority of the extent of the proposed investigations on the site known as Farm 1341. In terms of direct impacts to the area, the geotechnical investigation will involve the digging of test pits and the geohydrological investigation will make use of existing boreholes. The engineering, botanical, heritage, freshwater ecology and agricultural potential investigations will all involve access for site assessments.

2. Geotechnical Investigation

2.1 Desktop Study

- The intrusive fieldwork will be preceded by a brief desk study of the area, with regard to known geological conditions in close proximity to the site.
- If deemed necessary, a drive/walk-over will also be undertaken to determine access for the machine and confirm the site conditions to optimise the fieldwork.

2.2 Fieldwork

- The fieldwork will then be undertaken over two to three working days depending on access to properties.
- The intrusive field investigation will comprise of test pit being dug (approximately 1 per hectare) by means of a Tractor Loader Backhoe (TLB) to a max depth of 3.5m below ground level if no rock is encountered. The test pit operation will result in an appreciation of the near surface soil and/or rock conditions.
- During the test pit operations, disturbed samples will be taken from different soil profiles and shear vane testing may be performed within the test pits if deemed necessary.
- The appointed laboratory will then collect the material samples on site at the end of each day. The material will be tested of its engineering characteristics and recommendations on founding conditions, material suitability for construction as well as earthworks and excavation classifications will be provided.

2.3 Reporting

- Upon completion of the test pit investigation, a preliminary geotechnical report will be submitted detailing the visual assessment of the fieldwork.
- Once laboratory testing of the material is complete and has been analysed, a final report detailing the foundation and excavation recommendations for the site will then be submitted.

3. Geohydrological Investigation

3.1 Desktop Study

- Search of the National Groundwater Archive for existing geohydrological information.
- Internet search for existing geohydrological assessments of the study area.
- Review of existing assessments as provided by the client.
- Review of geological and geohydrological maps to identify any features that are indicative of groundwater.

- Review of the results of the geotechnical investigation to determine areas where the geology is likely to be more permeable.

3.2 Fieldwork

- The static water level and depth of accessible boreholes will be measured to identify the direction of the groundwater flow.
- Information on the yield and use of existing boreholes will be obtained.
- Three groundwater samples, (one up, mid and downstream) of the study area will be obtained, and analysed against the SANS241 Drinking Water Standard by an accredited laboratory.
- Groundwater samples will be obtained from existing boreholes, which will be pumped for a set time period, to obtain 'fresh' aquifer water.
- One surface water sample will be obtained and analysed against the SANS241 Drinking Water Standard.
- The surface water sample will be obtained through a grab sample from an accessible surface water resource, i.e. a dam.

3.3 Reporting

- Compilation of GIS data with regards to geology, geohydrology, groundwater quality, aquifer vulnerability, aquifer sensitivity of the area.
- Summary of existing geohydrological conditions, based on the document review.
- Discussion of the results of the ground and surface water analysis.
- Identification of the geohydrologically sensitive areas in the study area.

4. Engineering Investigation

4.1 Desktop Study

- Bulk sewer: Consultation with the municipality to determine the capacity in the reticulation in the vicinity of the proposed site as well as the capacity at the Waste Water Treatment Works to receive the additional sewerage.
- Bulk water: Consultation with the municipality to determine the capacity in the reticulation in the vicinity of the proposed site as well as the capacity at the Water Treatment Works to supply the additional water.
- Stormwater: High level investigation of the availability of stormwater structures in the vicinity of the site and recommendations if stormwater needs to be stored on site by way of a detention pond.
- Roads: The advising of standards for roads required in the area.

4.2 Fieldwork

A site assessment in order to confirm desktop findings.

4.3 Reporting

The compilation of a bulk services report.

5. Botanical Investigation

5.1 Desktop Study

A desktop study will be conducted that considers:

- National Vegetation Map
- Fine-scale botanical maps for the Western Cape Province (Drakenstein Municipality)
- Western Cape Biodiversity Framework – March 2017
- Interpretation of aerial photography – Google Earth
- Other relevant biodiversity or other data regarding the study area

5.2 Fieldwork

A site assessment during which:

- A survey of the terrestrial vegetation would be carried out from a vehicle and / or on foot to sample the different areas / plant communities determined in the aerial photography interpretation desktop exercise.
- Samples would be recorded at waypoints using a rapid assessment approach: plants species lists and photography. (This approach does not require the collection of plant specimens).

5.3 Reporting

Compilation of a Screening / Scoping phase report that:

- Outlines the findings from the desktop study and field-survey
- Describes the terrestrial vegetation and plant communities present in the study area
- Notes incidence of disturbance, invasion by alien invasive plant species
- Includes a map of the vegetation as well as a sensitivity (constraints) map
- Provides recommendations as to no go areas and areas suitable for development with and without mitigation;
- Identifies broad level mitigation measures likely to be required in a development context
- Notes limitations posed by sensitive terrestrial plant communities for the proposed development of a cemetery
- Notes the any legal implications of the proposed development with regard to terrestrial plant communities

6. Heritage Investigation

6.1 Desktop Study

- Research the necessary site and project information
- Confirm the application process with South African Heritage Resources Agency and Heritage Western Cape

6.2 NID

- Submit the Notification for Intent to Heritage Western Cape to do site investigations
- Submit a Notification of Intent to Develop Heritage Western Cape for potential future development

6.3 Fieldwork

A site assessment which will;

- Identify and map the heritage resources on the site and context and confirm their significance (excluding archaeology and palaeontology resources)

6.4 Reporting

- Propose the cultural significances of the site context and individual site heritage resources
- Identify the site's degree of sensitivity areas for future developments
- Identify the relevant heritage indicators for the future development on site
- Submit to client, land owner (SAHRA) for comment
- Submit to Heritage Western Cape for comment

7. Freshwater Ecological Investigation

7.1 Desktop Study

A desktop study that considers:

- The National Freshwater Ecosystem Priority Area (NFEPA) data for rivers and wetlands
- The findings of the Drakenstein River Management Plan with regard to the affected subcatchment
- The Drakenstein Municipality Wetland Layer
- The 1:50 000 river cover
- The DWAF (2014) national modelled Present Ecological State (PES) and Ecological Importance and Sensitivity (EI and ES) for the quaternary catchment
- Existing water quality data for the Berg River downstream and the affected tributary
- Other relevant biodiversity or other data regarding the study area

7.2 Fieldwork

A site assessment during which:

- the actual extent of wetlands on the property would be assessed and coarsely delineated using the national protocol of DWAF (2005)
- watercourses and other wetland types would be classified using the national aquatic ecosystem classification system (Ollis et al 2013)
- river and wetland condition would be evaluated in terms of PES and EIS

7.3 Reporting

Compilation of a Screening / Scoping phase report that:

- Outlines the above findings
- Includes a sensitivity map
- Provides recommendations as to no go areas, appropriate setbacks and areas suitable for development with and without mitigation;
- Identifies broad level mitigation measures likely to be required in a development context
- Notes opportunities for aquatic ecosystem improvement in a development context
- Notes limitations posed by aquatic ecosystem for the proposed development of a cemetery
- Notes the main legal implications of the proposed development with regard to aquatic ecosystems in terms of the National Water Act and .the National Environmental Management Act

8. Agricultural Potential Investigation

The Agricultural Potential investigation will be comprised almost entirely of desktop reviews of existing data. Soil sampling will be undertaken by hand to supplement the desktop studies.

