



NICK HELME BOTANICAL SURVEYS

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**BOTANICAL BASELINE ASSESSMENT OF
PROPOSED BOREHOLES H1A2 AND H1A5,
STEENBRAS.**

Submitted to: Aurecon Cape Town

27 May 2019

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence and include an abbreviated Curriculum Vitae.

I, N.A. Helme, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.



NA Helme

Abridged CV:

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University of Cape Town, South Africa. BSc (Honours) – Botany (Ecology & Systematics). 1990.

Since 1997 I have been based in Cape Town, and have been working as a specialist botanical consultant, specialising in the diverse flora of the great Cape Floristic Region. Since the end of 2001 I have been working on my own and trade as Nick Helme Botanical Surveys.

A selection of previous work undertaken in the region is indicated below:

- Botanical assessment of Steenbras dam drilling (Aurecon 2018)
- Baseline botanical assessment of Imhoff Farm, Kommetjie (Khula Environmental 2017)
- Botanical assessment of proposed sand mine near Brandvlei Dam (PHS Consulting 2017)
- Botanical assessment of Dragon's Nest, Hout Bay (Khula Environmental 2017)
- Specialist review of botanical IA studies for proposed Kapteinsklip development node, Mitchells Plain (Khula Environmental 2016)

- Botanical assessment of proposed development on farm Palmiet Valley 54, Wellington (Doug Jeffery Environmental Consultants 2015)
- Ecological assessment of proposed Arcelor Mittal power station, Saldanha (ERM 2015)
- Ecological assessment of proposed Globeleq power station, Saldanha (ERM 2015)
- Botanical assessment of proposed iGas pipeline Saldanha – Ankerlig (CES/ EOH 2015)
- Scoping and Impact Assessment of Proposed Wind Energy Facility near Swellendam (CSIR 2010)
- Scoping Assessment of Proposed Wind Energy Facility near Bredasdorp (CSIR 2010)
- Scoping and Impact Assessment of proposed Wind Energy Facility near Caledon (Savannah Environmental 2010)
- Scoping and Impact Assessment study of Proposed Wind Energy Facility near Caledon (Arcus Gibb 2009 & 2010)
- Impact Assessment of proposed Blue Crane Signature Golf Estate, Caledon (Doug Jeffery Environmental Consultants; 2010)
- Kogelberg Biosphere Reserve corridor study (CapeNature; 2008)
- Botanical Assessment of Erf 173, Hawston (PHS Consulting; 2008)
- Botanical Assessment of Farm 587/6, Cloud's End, Hemel & Aarde (Peter Dall Consultancy; 2007).
- Botanical Scoping and Impact Assessment of proposed Romansbaai development, Danger Point (Doug Jeffery Environmental Consultants; 2006 & 2007)
- Botanical Assessment of Erf 4574, Betty's Bay (Headland; 2006)
- Botanical Assessment of Erf 4570 and Erf 4576, Betty's Bay (Headland; 2006)
- Botanical Assessment of Erf 589 and Ptn. Erf 595, Greyton (DJ Environmental Consultants; 2006)
- Botanical Assessment of eastern portion of farm Afdakrivier 575, Fisherhaven (Mr J. Carstens; 2006)

TABLE OF CONTENTS

Introduction	1
Terms of Reference	1
Limitations, Assumptions & Methodology	2
Study Area Context	2
Description of the Vegetation in the Study Areas	5
References	7

1. INTRODUCTION

This specialist botanical input was requested to inform positioning and management of 2 proposed abstraction boreholes in the Steenbras wellfield area (see Figure 1). These two new wells will be percussion drilled in positions chosen by the hydrogeologists, and will target the Peninsula formation (generally deep, and water bearing), and their water would be fed into pipelines and thence into the Steenbras dam.

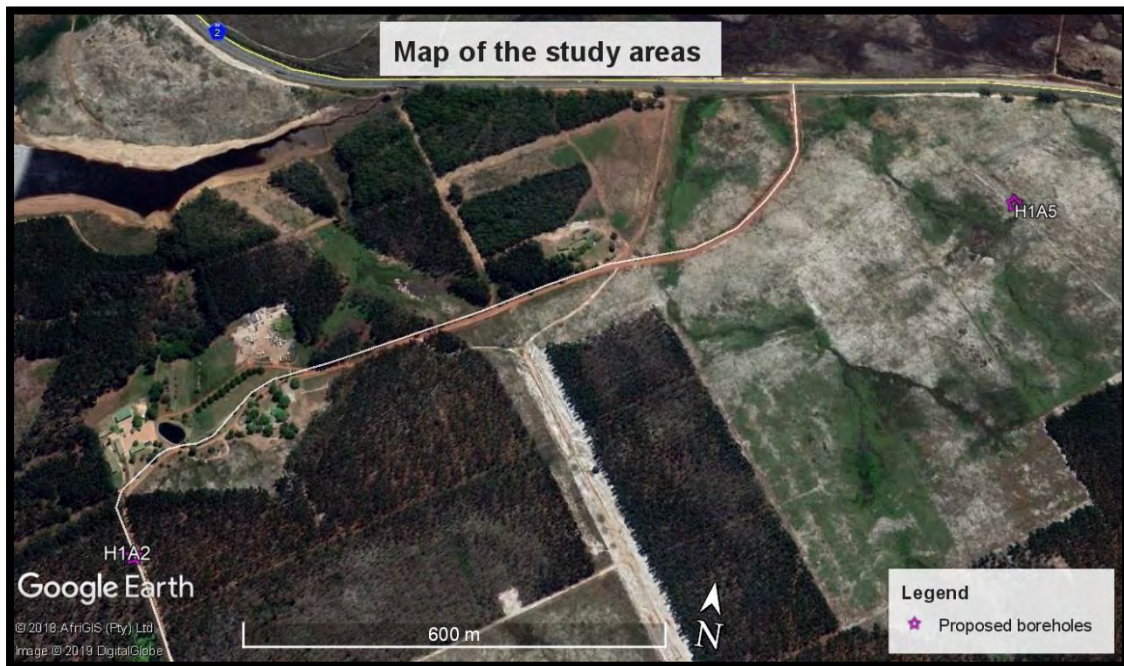


Figure 1: Satellite image of the study area showing position of the 2 proposed drill sites in the Steenbras area.

2. TERMS OF REFERENCE

The terms of reference (ToR) for this specialist input were as follows:

- undertake a site visit to assess the vegetation in the study areas
- compile a report that describes the vegetation in the study areas and places it in a regional context
- identify and locate any plant Species of Conservation Concern in or close to the study areas
- provide an overview of the botanical conservation significance (sensitivity) of the study areas
- provide recommendations on whether the sites are botanically suitable for the proposed drilling
- indicate if any special mitigation is required, and if so what needs to be done for each site.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The study area was visited on 24 May 2019. Although seasonal constraints were evident in terms of the non-flowering of a few annuals and geophytes this is not deemed to be a significant issue as the bulk of the plant species in the area are perennials and these were mostly identifiable and evident during the survey.

For purposes of this report the terms site and study area are used interchangeably and refer to a 30m by 10m rectangle centred on the proposed drill site. The H1A2 area had already been staked out and cleared (see Plate 1).

All identifiable plant species were noted in the field, and various digital photographs were taken. The GIS based South African National Biodiversity Institute (SANBI) vegetation map for South Africa (Mucina & Rutherford 2006 and 2012 update) was consulted, along with the National List of Threatened Ecosystems (DEA 2011), and other relevant references noted in the text. Conclusions were drawn based on this documentation and professional experience in the area and the region.

4. STUDY AREA CONTEXT

The study area is located within the Southwest Fynbos Subregion of the Fynbos biome and is within the Core Cape Subregion (CCR) of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world, and it is also by far the smallest floristic region. The Core Cape Subregion occupies only 0.1% of the world's land surface, and supports about 9400 plant species, almost half of all the plant species in southern Africa, and some 20% of the plant species in sub-Saharan Africa. About 68% of all the species in the CCR do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). The montane areas have an especially high number of narrow endemics, and these are thus vulnerable to impacts such as high-altitude drilling (especially percussion drilling which causes more disturbance) and associated soil disturbance (road building, pipelines, sump excavation, etc). Most of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the Red Data Book listing process undertaken for South Africa is that 67% of the threatened plant species in the country occur only in the Fynbos biome, and these total over 1800 species (Raimondo *et al* 2009)! It should thus be clear that the southwestern Cape is a

major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species. Developments in this area thus need to take this into account.

The Southwest Fynbos bioregion is renowned as the “core of the Fynbos region”, and has exceptionally high levels of diversity, and exceptionally high level of narrow endemics (Raimondo *et al* 2009).

5. DESCRIPTION OF THE VEGETATION IN THE STUDY AREAS

The vegetation map of South Africa (Mucina & Rutherford 2006) indicates that the original vegetation type present in both study areas is Kogelberg Sandstone Fynbos, and this classification is supported.

Kogelberg Sandstone Fynbos is restricted to nutrient poor, sandstone derived soils in the relatively high rainfall Hottentots Holland and Kogelberg areas and is regarded as Critically Endangered on a national basis, due to the very high number of rare and localised plant species that it supports, not because the habitat is inherently threatened (DEA 2011). Some 83% of the original total extent of this vegetation type remains, and about 59% is formally protected, with a national target of 30% (Rouget *et al* 2004). The unit is this well protected, and still largely intact, with the main impacts having been forestry and dam building.

5.1 H1A2

Borehole H1A2 is located on a fairly gentle north facing slope, not far from the main offices at Steenbras. Soils in the area are brown loamy sands, and the site is not within any evident wetland or drainage line, although some of the nearby plants are wetland plants, and indicate some surface seepage and moisture. The area is mapped as a Core 1 area (Fair condition) in the City of Cape Town Biodiversity Network (Holmes *et al* 2012), indicating that it is a “Protected Area proclaimed in perpetuity.” As can be seen in Plate 1 the mature pine plantation that was present here for many decades has just been felled, and the site itself has been scraped (removing all topsoil) and staked out with black fence droppers. Both activities have caused significant damage to the natural vegetation that was present in the study area, and the scraping of the area has effectively removed all trace of any indigenous vegetation in the actual study area. The adjacent area that has not been scraped was thus surveyed to give an indication of what vegetation would have likely been present in this area.

Indigenous species diversity in the adjacent area was low to moderate. Species recorded include *Leucadendron xanthoconus*, *Gleichenia capensis*, *Berzelia lanuginosa*, *Mastersiella digitata*, *Erica equisetifolia*, *Erica intervallaris*, *Cliffortia atrata*, *C. ruscifolia*, *Syncarpha vestita*, *Lanaria lanata*, *Tetraria sp.*, *Restio versatilis*, *Passerina corymbosa*, *Elytropappus gnaphaloides*, *Ursinia abrotanifolia*, *Lobelia coronopifolia*, *Erica pulchella* and *Plecostachys serpyllifolia*.

No plant Species of Conservation Concern (SCC) were recorded from or very close to this site. The likelihood of there being undetected Species of Conservation Concern on or near this site is deemed to be Low, given the previous site disturbance by forestry activities.



Plate 1: View of the H1A2 site, looking north. The area has recently been cleared and staked out, and the mature pines that dominated this area for decades have also been removed in the last few weeks.

Botanical Sensitivity in footprint: Very Low

Botanical Sensitivity in adjacent area: Medium

Botanical Mitigation required: None on the site

Notable issues: Possible wetland issues nearby to the south.

5.2 H1A5

Borehole H1A5 is located on a gentle northwest facing slope, about 600m down an old track that was previously used to access this area, but which has not been driven for many years, and is rehabilitating naturally. The area was burnt in a wildfire at the end of 2017, and there has been substantial vegetation recovery. There is clear evidence of wetland vegetation about 40m to the southwest of the site, although the site itself is relatively well drained. 40cm deep roadside cut drains are noticeably damper than the road or nearby soil surface. There are scattered stumps of pine trees in the general area, but no evidence to suggest that there was a plantation here in the last 20 years. Soils in the area are white, acid sands.

Indigenous species diversity is moderate to high in the likely footprint.

Indigenous species recorded include *Pentameris pallida*, *Oxalis luteola*, *Mastersiella digitata*, *Elytropappus gnaphaloides*, *Mastersiella digitata*, *Erica equisetifolia*, *Erica intervallaris*, *Cliffortia atrata*, *C. ruscifolia*, *Ursinia abrotanifolia*, *Syncarpha vestita*, *Capeochloa cincta*, *Lanaria lanata*, *Tetraria compar*, *Tetraria sp.*, *Restio versatilis*, *Restio triticeus*, *Restio capensis*, *Restio bifarius*, *Passerina corymbosa*, *Elytropappus gnaphaloides*, *Stoebe cinerea*, *S. plumosa*, *Ficinia indica*, *Ursinia abrotanifolia*, *Lobelia coronopifolia*, *Erica pulchella*, *E. hispidula*, *E. corifolia*, *Hypodiscus aristatus*, *Elegia juncea*, *Thamnochortus lucens*, *Senecio pubigerus*, *Nevillea obtusissima*, *Geochloa rufa* and *Micranthus junceus*.

No plant Species of Conservation Concern (SCC) were recorded from or very close to this site. The likelihood of there being undetected Species of Conservation Concern on or near this site is deemed to be Low to Medium.

A small patch of alien invasive *Acacia mearnsii* (black wattle) is present about 30m southwest of the site, but there is no evident pine in the study area.

Botanical Sensitivity in footprint: Medium – High

Botanical Sensitivity in adjacent area: Medium - High

Botanical Mitigation required: Remove all alien invasive vegetation within 40m of drill site; no disturbance of natural vegetation outside footprint; keep core of drill area in old road; minimise disturbance to access road.

Notable issues: Wetland about 40m to southwest; old track provides access, although partly rehabilitated.



Plate 2: View of H1A5, looking east. The whitish area on the centre and righthand side of the picture is the old road surface, now partly rehabilitating.

6. REFERENCES

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