

APPENDIX 5

SPECIALIST REPORTS



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Pri.Sci.Nat # 400045/08

**BOTANICAL ASSESSMENT OF PROPOSED NEW
CULTIVATION ON ZONDERWATERKRAAL FARM,
SUID BOKKEVELD, NORTHERN CAPE.**


Prepared for: Footprint Environmental Services, Porterville

22 September 2016

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.



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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 south-western Cape. Since the end of 2001 I have been the Sole Proprietor of Nick Helme Botanical Surveys.

A selection of relevant previous botanical work is as follows:

- Botanical assessment of proposed cultivation on Groot Patrysvlei, Clanwilliam (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on Rem. Andriesgrond 204, Clanwilliam (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of proposed dam on Grootbos farm, Riversdale (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of proposed dam on Modderfontein farm, Citrusdal (Cederberg Environmental Assessment Practise 2015)

- Botanical assessment of proposed cultivation on farms Laastedrif & Kleinvlakte, Bo Swaarmoed, Ceres (Cederberg Environmental Assessment Practise 2014)
- Botanical assessment of Remainder of Farm Rietfontein 244, Piketberg (Cederberg Environmental Assessment Practise 2014)
- Botanical Assessment of farm Draaihoek 293, Vredendal (Cederberg Environmental Assessment Practise 2013)
- Botanical Assessment of farm Gideonsoord 303, Klawer (Cederberg Environmental Assessment Practise 2013)
- Botanical assessment of proposed agricultural expansion on Remainder of Farm Chilton 160, Piketberg (Cederberg Environmental Assessment Practise 2013)
- Botanical assessment of proposed Namakwa Sands expansion area, Brand se Baai (SRK Consulting 2013)
- Botanical assessment of proposed new N7 alignment near Clanwilliam (CCA Environmental 2013)
- Scoping study of proposed Paleisheuwel Solar PV facility, near Leipoldville (Sharples Environmental 2012)
- Botanical assessment of Farm 251, Vanrhynsdorp (PPC 2011)
- Botanical scoping study of proposed Wind Energy Facility near Brand se Baai (Savannah Environmental 2010)
- Botanical assessment of a portion of Sandrug farm, Leipoldville (Footprint Environmental 2010)
- Botanical assessment of a portion of Kookfontein farm, Lambert's Bay (Footprint Environmental 2010)
- Botanical assessment of portion of Swartboskraal farm, Paleisheuwel (Footprint Environmental 2010)
- Botanical assessment of portion of Suurfontein farm, Lambert's Bay (Footprint Environmental 2010)
- Botanical basic assessment of Kruisfontein farm, Redelinghuys (Cederberg Environmental Assessment Practise, 2009)
- Botanical scoping and impact assessment for proposed Eskom Wind Energy Facility near Vredendal (Savannah Environmental, 2007)
- Best practise guidelines for Potato Farming in the Sandveld (CapeNature & Potatoes South Africa 2007)

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1. INTRODUCTION

This botanical assessment was commissioned in order to help inform decisions regarding the application to develop new rooibos tea fields on about 20.6ha of currently natural vegetation on the farm known as Zonderwaterkraal, about 55km south of Nieuwoudtville, in the Northern Cape. The southern boundary of the property is the Doring river.

Two original study areas were proposed (see Figures 1 & 2), but this was modified based on site surveys with the landowner, and four separate study areas were thus proposed and are here also assessed (see Figures 1 & 2). Area 1 is about 2.5ha, area 2 is about 10.8ha, area 3 is about 2.0ha and area 4 is about 1.2ha (16.5ha in total). The overall property is about 1050ha in extent.

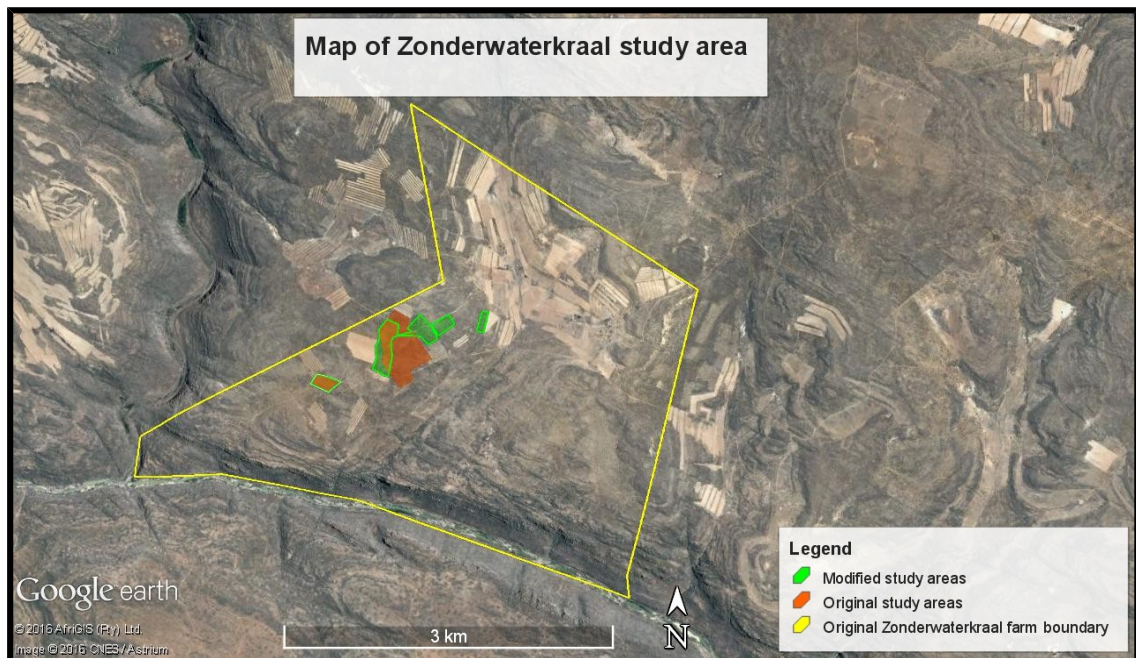


Figure 1: Satellite image showing the study areas. The original farm boundary is indicated by the yellow outline, but it would appear that this total area now has at least three separate owners.

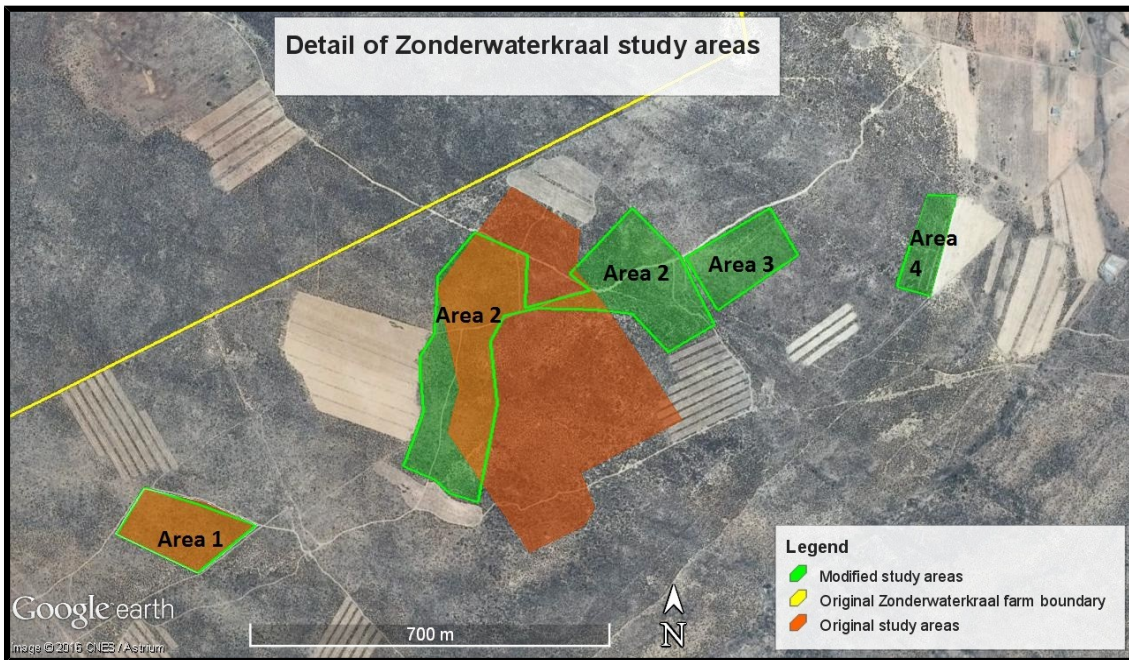


Figure 2: Map showing numbering and detail of the various study areas.

2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- undertake a site visit to assess the vegetation in the study areas
- compile a botanical report which describes the vegetation in the study area and places it in a regional context, including its status in terms of the CapeNature FineScale Conservation Assessment
- identify and map any plant Species of Conservation Concern in the study area
- map any wetlands in the study area
- provide an overview and map of the ecological conservation significance (sensitivity) of the proposed cultivation and the greater property
- identify likely botanical impacts of the proposed development layout
- assess the significance of the ecological impacts, as per standard Impact Assessment methodology
- provide recommendations in order to minimise the ecological impacts, including discussion of possible conservation tradeoff (offset) areas elsewhere on the greater property.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The site was visited on 7 and 8 September 2016. Although rainfall was well below average this rainy season (May – August) most of the seasonal bulbs and annuals were recorded flowering and were identifiable during the site visit, as were most of the shrubs. Most (but not all) of the potential localised and threatened species in the area can still be identified when not flowering, provided that the observer has experience with the species concerned, and is able to identify sterile or fruiting material. The seasonal constraints on the comprehensiveness of the botanical observations and findings are thus believed to be relatively minor. The confidence levels in the botanical findings are considered to be high, but it should be noted that certain species are always likely to be missed due to the fact that many species are identifiable or evident for only short periods during the year, some of which may be rare or threatened. It is thus possible that some of the areas were assessed as being of lower conservation value/sensitivity than they in fact are. The extreme age of the veld in the study area (<40yrs since fire) also means that many species may now be effectively invisible, being present only as soil stored seed or bulbs, which may result in a further underestimate of plant diversity and sensitivity.

In order to supplement the species data I used a habitat based approach, in which overall habitat quality, as determined by species richness and presence of key indicator species, is used to determine conservation value – which is a term often used interchangeably (but incorrectly) with “sensitivity”.

During the field visit I walked various transects across the sites, and drove most of the available tracks. I also walked and drove parts of the adjacent natural areas in order to form an opinion on the context and relative importance of the actual study area. During the walks I noted the condition of the veld and habitats, using community structure, species abundance and floristics (species present, notably the Species of Conservation Concern; SCC) as indicators. I recorded all plant species in a notebook, and took various digital photographs. Certain plant collections were made, which have been turned into voucher specimens and deposited at the Compton Herbarium at Kirstenbosch for future reference, and photos of most of the SCC are on the website ispot.org.za. The GIS based South African National Biodiversity Institute (SANBI) vegetation map for South Africa (Mucina & Rutherford 2012) was consulted, the Sandveld and Bokkeveld Fine Scale Vegetation Map and Conservation Plan (Helme 2007; Pence 2008), along with the National Spatial Biodiversity Assessment (NSBA;

Rouget *et al* 2004), the Western Cape Framework Update (Pence 2012) and the National List of Threatened Ecosystems (DEA 2011). Conclusions were drawn based on this documentation and twenty five years of professional experience in the area and the region.

Google Earth satellite imagery dated February 2016 (and earlier) was used to verify vegetation patterns, and for mapping purposes. Google Earth Pro was used to measure polygon areas.

The No Go alternative is assumed to be a continuation of the *status quo*, *i.e.* no further cultivation of virgin land in the study area, and moderate levels of livestock grazing.

It was agreed with the landowner on site that the new lands will consist of traditional “stroke” (strips) of cleared and adjacent natural vegetation, rather than total clearing of authorised areas, in order to minimise wind erosion and facilitate rehabilitation when the fields are no longer in use.

It is important to note that the original study area (see Figure 2) has been modified to exclude all the High sensitivity areas identified on site, as well as some rocky areas, and that the impact assessment uses the original areas as the pre mitigation scenario, and the modified study areas (also shown in Figure 2) as the post mitigation scenario. It is assumed that the preferred study areas, shown in green in Figure 2, will be the total extent of any eventual new vegetation clearing on the property.

4. STUDY AREA AND REGIONAL CONTEXT

Soils in the study areas are typically sandy soils derived from the underlying sandstone. In all four of the final study areas the sands are generally deep, although in places (generally outside the modified areas, but often within the original areas) there are small outcrops of sandstone bedrock. There are no wetlands or drainage areas within any of the study areas.

4.1 National and Regional Context

The site is part of the Northwest Fynbos bioregion (Mucina & Rutherford 2006), and this is part of the Fynbos biome, located within what is now known as the Core Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world, and is the only one largely confined to a single country (the Succulent

Karoo component extends into southern Namibia). It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and supporting about 11500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Many of the lowland habitats are under pressure from agriculture (typically the biggest habitat threat nationally), 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 nationwide plant Red Listing process undertaken is that 67% of the threatened plant species in the country occur only in the southwestern Cape (which for this analysis includes the Bokkeveld), 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.

The study area falls within what is generally known as the Suid Bokkeveld, being part of the greater Bokkeveld region. The Bokkeveld was identified by Raimondo *et al* (2009) and the C.A.P.E. (Cape Action for People and the Environment) project as an area under heavy transformation pressure, primarily from agriculture, and the latter consequently initiated (via CapeNature) a Fine Scale Vegetation Mapping and Conservation Planning project (FSP) in order to identify key conservation priorities in the region (large parts of which are within the Western Cape). The FSP has identified key conservation areas that are needed to meet species, habitat connectivity and process targets in the Bokkeveld and Sandveld – these are known as Critical Biodiversity Areas (CBAs). This was updated for the Hantam Municipality (which includes the study area) in 2012 (Pence 2012), and drew on CapeNature data for this region.

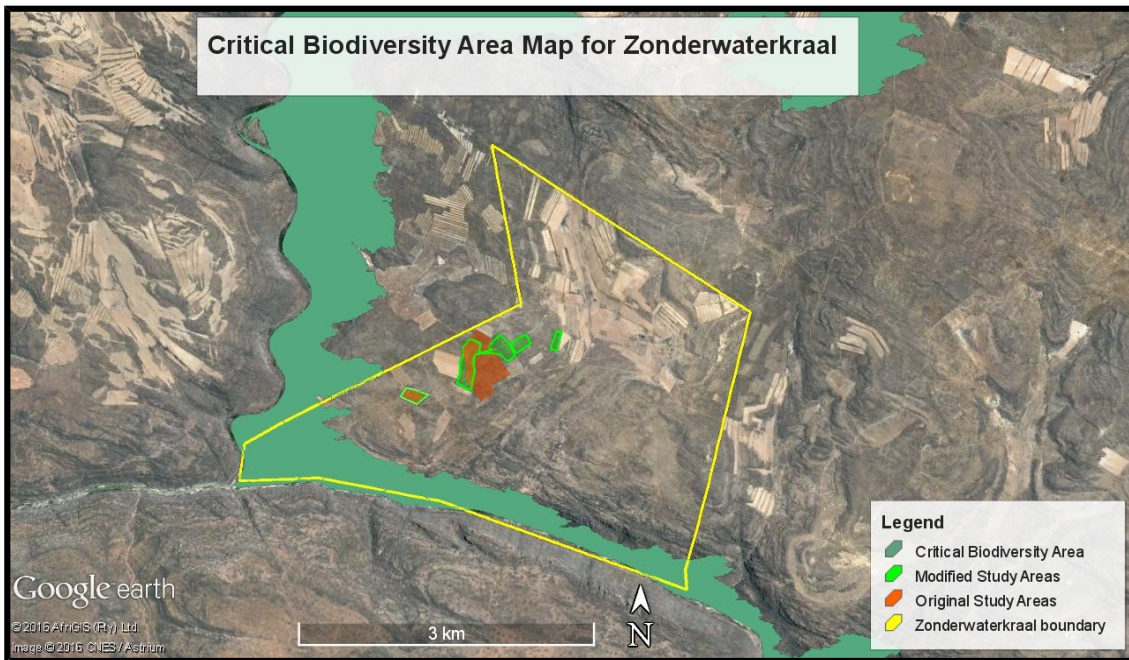


Figure 3: Extract of the Critical Biodiversity Area (CBA) map for the Hantam Municipality (Pence 2012). The mapped terrestrial CBAs are shown in green shading.

The CBA map for the study area is shown in Figure 3, and it can be seen that none of the study areas are included as CBAs. Areas on Zonderwaterkraal that have been selected as CBAs have been selected for habitat representation, priority subcatchments, edaphic interfaces and for ecological connectivity value.

5. THE VEGETATION ON SITE

5.1 Background

According to the SA Vegetation map all proposed development areas are within **Doringrivier Quartzite Karoo** (Mucina & Rutherford 2012). This is however very clearly a mistake for the sandy areas (probably caused by this author, as the person responsible for the Bokkeveld fine scale vegetation mapping!), and would obviously be best mapped as **Nardouw Sandstone Fynbos**. Consequently no extract of this vegetation map is included here, as it adds no value.

Nardouw Sandstone Fynbos was only recognised subsequent to drawing up of the national list of threatened habitats and is consequently not listed by DEA (2011). However, Pence (2014) re-assessed this and other habitats in the region for the Western Cape Biodiversity Framework Update, and found that it should be listed as a

Vulnerable vegetation type (Pence 2014), and this classification is supported and is used in this report.

Fire is an important driver of Fynbos dynamics, and is necessary perhaps once every fifteen to twenty five years in Arid Fynbos vegetation types in order to maintain optimal ecological functioning (Helme 2007, Cadman 2016). The vegetation in the study area is estimated to be at least 40 years old, with no signs of recent fire, and the area is consequently well overdue for a fire, with the vegetation showing extensive signs of senescence (old, woody plants dying of old age).

There are various spatial elements of ecological processes on the property, including soil type gradients (ecotones or edaphic interfaces), where loamy sands meet the sandy soils, and small soil moisture gradients. No wetlands are found within or close to the study areas. Most of the study areas currently have good ecological connectivity in all directions.

Livestock trampling and grazing impacts are evident in many parts of the property, but are not pronounced within the various study areas. There is no alien invasive vegetation in the study areas.

5.2. Area 1

The site is slightly southwest facing, and is part of a sandy plateau. Soils are generally deep sands, although these maybe shallower in places. Exposed bedrock is not evident. The vegetation is in fairly good condition, but is well overdue for a fire, with many senescent shrubs. Species diversity is moderate, and appears typical of these habitats in the Suid Bokkeveld.



Plate 1: Overview of Area 1, looking east. The large shrub at left is *Leucadendron procerum*.

Indigenous species present include *Willdenowia incurvata*, *Thamnochortus platypterus*, *Ruschia cf carolli*, *Amphiglossa tomentosa*, *Phylla rigidifolia*, *Aristida junciformis*, *Wahlenbergia* sp4 (undescribed), *Ficinia indica*, *Gymnodiscus capillaris*, *Euphorbia rhombifolia*, *E. tuberosa*, *E. burmanii*, *Heliophila pinnata*, *Lyperia tristis*, *Adenogramma glomerata*, *Helichrysum moeserianum*, *H. dasyanthum*, *Ursinia anthemoides*, *U. cakilefolia*, *Struthiola ciliata*, *Ruschiella lunulata*, *Convolvulus capensis*, *Ehrharta calycina*, *Dimorphotheca pluvialis*, *Cyanella hyacinthoides*, *Osteospermum monstrosum*, *Albuca cooperi*, *Leysera tenella*, *Muraltia spinosa*, *Gorteria personata*, *Lapeirousia fabricii*, *L. jacquinii*, *Cleretum bellidiforme*, *Lachenalia uniflora*, *L. mutabilis*, *Hermannia trifurca*, *Trachyandra revoluta*, *T. paniculata*, *Chlorophytum undulatum*, *Hebenstretia repens*, *Dischisma clandestinum*, *Ornithoglossum viride*, *Hymenogyne conica*, *Rumex cordatus*, *Oxalis flava*, *Moraea fugax*, *Anthospermum spathulatum*, *Felicia dubia*, *Crassula dichotoma*, *Ornithogalum thyrsoides*, *Selago* sp., *Searsia dissecta*, *Tetragonia spicata*, *Limeum africanum*, *Isolepis* sp., *Pelargonium triste*, *Pharnaceum lanatum*, *Gladiolus alatus*, *Asparagus capensis*, *Microloma sagittatum*, *Nemesia anisocarpa* and *Metalasia adunca*.

5.2.1 Species of Conservation Concern

Two plant Species of Conservation Concern (SCC; previously usually known as Red Data Book listed species; Raimondo *et al* 2009) were recorded from this area, and

there is a low likelihood that others may be present. Redlist status is according to www.redlist.sanbi.org.

One plant of *Metalasia adunca* (Near Threatened) is present here, and this is regarded as a regionally insignificant subpopulation, and its loss would not be of any significance, as this a typical Sandveld element, and is very wide ranging, from Hondeklipbaai to Cape Town.

Four plants of *Leucadendron procerum* (Near Threatened) are present. This is regarded as a regionally insignificant subpopulation, and its loss would not be of any significance, as this is still a fairly common Sandveld element, from here south to Redelinghuys.

5.3 Area 2

The original Area 2 covers about 18ha and includes some extensive areas of deep sands, mostly facing southeast, and shallower sands and even exposed bedrock in the northern plateau portions. Species composition is broadly similar to Area 1, but the differences are discussed below.

The High sensitivity portion is characterised by the presence of at least four plant Species of Conservation Concern (SCC; see Section 5.3.1) – namely *Leucospermum praemorsum* (see Plate 2), *Leucadendron procerum*, *Annessorhiza* sp nov., and *Metalasia adunca*. In some parts the former species are dominant, within a matrix of *Willdenowia incurvata*.

The Medium sensitivity portions of Area 2 are characterised by an absence of the four SCC noted above, and are dominated by *Willdenowia incurvata*, *Thamnochortus platypterus* and *Amphiglossa tomentosa*.



Plate 2: View of Medium sensitivity part of Area 2, looking west.



Plate 3: View of High sensitivity area on deep sands, within original large study area, looking south. The large shrubs in the foreground are *Leucospermum praemorsum* (Vulnerable), and the shrubs in the distance are *Leucadendron procerum* (Near Threatened). Zonkwasriet (*Willdenowia incurvata*) is dominant.

5.3.1 Species of Conservation Concern

Four plant Species of Conservation Concern were found within this study area, and the likelihood of there being others is deemed to be Low to Medium.

Three plants of *Metalsia adunca* (Near Threatened) are present here, and this is regarded as a regionally insignificant subpopulation, and its loss would not be of any

significance, as this a typical Sandveld element, and is very wide ranging, from Hondeklipbaai to Cape Town.

Four specimens of the very cryptic geophyte *Annessorhiza* sp nov. were found here. This undescribed carrot family member is known from just a few collections, all in the area from Vanrhynsdorp to Clanwilliam (A. Magee – pers. comm.), and is quite possibly both rare and threatened, but has not yet been assessed for the Redlist. It's presence here is regarded as regionally significant, even though it is likely to be present in larger numbers nearby.

At least thirty plants of *Leucadendron procerum* (Near Threatened) are present. This is regarded as a regionally fairly significant subpopulation, and its loss would not be of significance, even though it is still a fairly common Sandveld element, from here south to Redelinghuys.

Leucospermum praemorsum (Plate 3) has a remarkably wide range in the Sandveld, from here all the way north to Hondeklipbaai, but it has viable populations only here in a few parts of the Suid Bokkeveld, in a couple of remote spots near the Groen River, and in the Namaqua National Park east of Hondeklipbaai. Populations on the Gifberg and Nardou plateau have been decimated by rooibos tea cultivation over the last twenty years (pers. obs), and the species is Redlisted as Vulnerable (Rebello *et al* 2005).

5.4 Area 3

This site is gently southeast facing, and the sands appear to be fairly deep, with no exposed bedrock. The vegetation is not in particularly good condition, and shows signs of having been heavily grazed and trampled.

Willdenowia incurvata is dominant, with *Struthiola ciliata*, *Amphiglossa tomentosa*, *Thamnochortus platypterus* and *Athanasia trifurcata*. Overall species composition is fairly similar to that found in Area 1, but tends to be a subset of that, with fewer species overall and more open space.

No plant Species of Conservation Concern were recorded here, and none are likely to occur.



Plate 4: View of area 3, looking east over this area.

5.5 Area 4

This east facing area of deep sands is located below a rocky ridge and above an existing cultivated land. The area has a moderate plant diversity, but lacks the longer lived, large shrubs.



Plate 5: View of Area 4, looking east over the area.

The area is dominated by *Willdenowia incurvata*, *Thamnochortus platypteris*, *Adenogramma glomerata*, *Ehrharta thunbergii*, *Muraltia spinosa*, *Struthiola ciliata* and *Amphiglossa tomentosa*. Additional species include *Ficinia indica*, *Gladiolus alatus*, *Phyllis rigidifolia*, *Oxalis flava*, *Searsia dissecta*, *Gymnodiscus capillaris*, *Wahlenbergia sp.4.*, *Ursinia anthemoides*, *Helichrysum moesianum*, *Athanasia trifurcata*, *Anthospermum spathulatum*, *Wiborgia obcordata*, *Hymenogyne conica*,

Albuca cooperi, *Felicia dubia*, *Chlorophytum undulatum*, *C. viscosum*, *Dischisma clandestina* and *Conicosia pugioniformis*.

No plant Species of Conservation Concern were recorded here, and none are likely to occur.

6. BOTANICAL SENSITIVITY

The terms conservation value and sensitivity are often used interchangeably, but this is not strictly correct. The term “conservation value” refers to the value of the habitat in local and regional conservation terms (*i.e.* answering the question how important is it?), whilst “sensitivity” strictly means how resilient is the habitat to disturbance. In the case of urban or industrial development any natural or partly natural habitat would effectively be permanently lost in the development footprint, and thus technically sensitivity would be high, irrespective of the conservation value of the underlying habitat. For agricultural development sensitivity in some ways reflects how well the area could potentially rehabilitate after cessation of cultivation, with high sensitivity areas having low rehabilitation potential and low sensitivity areas having high rehabilitation potential. The term sensitivity is however simpler and better understood by most and is thus used hereafter in this report.

The botanical sensitivity of a habitat is a product of species diversity, rarity of habitat, rarity of species, ecological viability and connectivity, vulnerability to impacts, and reversibility of threats (ease of rehabilitation). Extensive previous work in the region has allowed the author to make conclusions regarding the overall and relative sensitivity of the vegetation in the study area (see Figure 4).

Areas that have been cultivated or have otherwise been heavily disturbed, have low botanical diversity, and have no regionally important populations of plant Species of Conservation Concern (SCC) are considered to be of Low botanical sensitivity at a regional scale. There are no areas of Low sensitivity in the current study areas.

Areas with a moderate to high indigenous plant diversity and moderate to high structural heterogeneity, and with up to three recorded plant Species of Conservation Concern (SCC), of minor regional significance, are mapped as being of Medium sensitivity. The underlying vegetation type may be regionally threatened. Most of the vegetation in the study area is of Medium sensitivity.

High sensitivity areas support intact examples of a threatened vegetation type, and usually support significant populations of at least three plant Species of Conservation Concern, and typically support irreplaceable species assemblages or habitats. These areas are often also mapped CBAs (Critical Biodiversity Areas). Note that in some cases even degraded areas may be of High conservation value because of their ecological connectivity value, as they may connect two patches of High conservation value. High sensitivity areas should be considered No Go areas for development. In this study a large High sensitivity areas was identified in and around the original Area 2, with another smaller area to the north (see Figure 4).

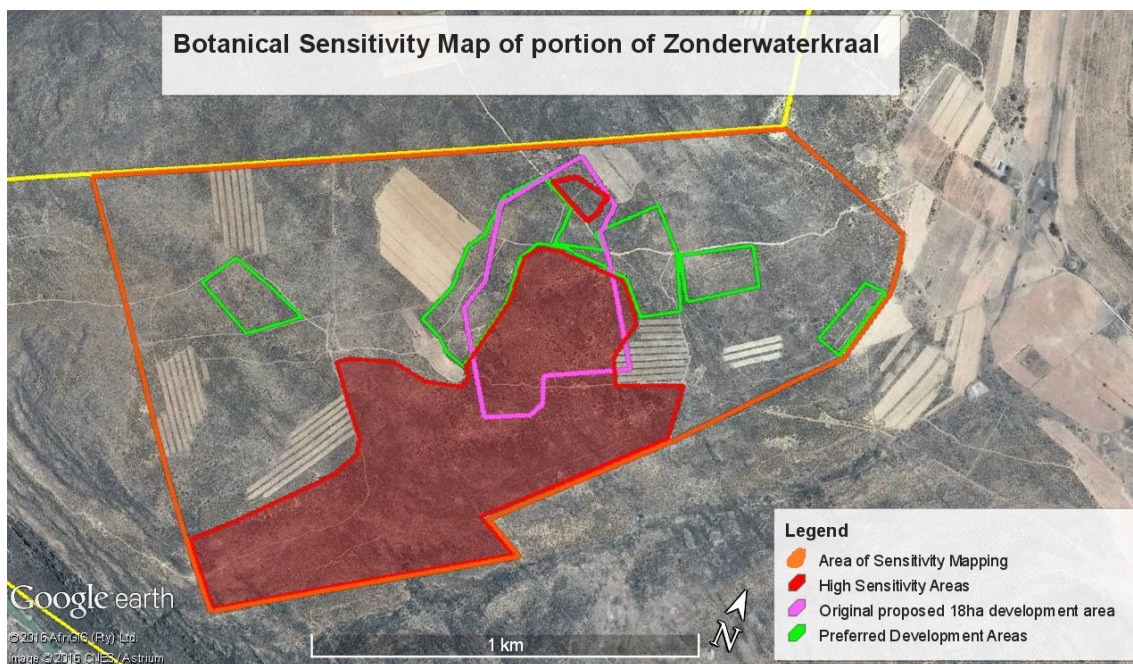


Figure 4: Botanical sensitivity map of a portion of Zonderwaterkraal. All unshaded areas within the mapped area are of Medium sensitivity (the natural vegetation, darker areas) or of Low botanical sensitivity (the cultivated, lighter areas).

Very High sensitivity areas have intact vegetation that supports irreplaceable plant populations or communities that are not known to occur elsewhere, or that occur elsewhere in only very low numbers. These areas often also support at least five plant Species of Conservation Concern. Very High sensitivity areas should be considered No Go areas for development. In this study no Very High sensitivity areas were identified.

7. IDENTIFICATION OF LIKELY IMPACTS

Any development usually has both direct and indirect impacts on the vegetation and ecology, and this would be the case with the proposed development. Direct impacts usually occur as a result of the construction or development phase, whilst the indirect impacts may occur at this stage but can also take place at the post development (operational) phase. Indirect impacts are often hard to observe and measure, but may in many cases be more significant than the direct impacts, although this is not usually the case in a partly natural agricultural landscape.

It is important to note that the original study area (see Figure 2) has been modified to exclude all the High sensitivity areas identified on site, as well as some rocky areas, and that the following assessment uses the original areas as the pre mitigation scenario, and the modified study areas (also shown in Figure 2, in green) as the post mitigation scenario.

7.1 Construction Phase Impacts

The development of about 20.6ha of new cultivation (original area, as shown in Figure 2) would effectively result in the permanent loss of nearly all existing natural vegetation (and most of the associated fauna and ecology) in the development footprint. The vegetation type to be impacted (Nardou Sandstone Fynbos) is regarded as a Vulnerable vegetation type at a regional and national scale (Pence 2014).

The proposed development (pre and post mitigation) would not result in the loss of any mapped Critical Biodiversity Areas.

The proposed development (pre mitigation) would result in the loss of the site populations of at least four different plant Species of Conservation (SCC; *Metalasia adunca*, *Leucospermum praemorsum*, *Leucadendron procerum* and *Annessorhiza sp nov*), and the latter three all have regionally significant populations within the largest proposed development area. All other direct botanical impacts would be relatively minor in relation to those noted above.

7.2 Operational Phase Impacts

Operational phase impacts will take effect as soon as the natural vegetation on the site is lost, and will persist in perpetuity, or as long as the area is cultivated. Operational phase impacts include loss of ecological connectivity across the sites (low - moderate

significance), habitat fragmentation (low - moderate significance), impact on natural fire regime (moderate significance), reduction in local populations of four threatened species and hence their local viability (moderate significance), and impacts on the associated animal fauna (probably of minor significance for all areas, mainly for invertebrates). All areas are for proposed rooibos tea lands (strips), which are likely to be regularly sprayed with various insecticides and fungicides, and spray drift is likely to have a significant negative impact (even if organic insecticides) on adjacent natural vegetation and fauna (notably the insects, which are key pollinators of many species).

8. IMPACT ASSESSMENT

8.1 Construction Phase Impacts

In the case of this project the primary construction phase impact is loss of natural vegetation within the new development footprint, which totals about 20.6ha.

For purposes of this assessment it is assumed that about 20.6ha of new cultivation will be undertaken, and this will be entirely within a Vulnerable vegetation type (Nardou Sandstone Fynbos). All of the areas to be cultivated are of Medium or High botanical sensitivity.

The proposed development (pre mitigation) would result in the loss of the site populations of at least four different plant Species of Conservation (SCC; *Metalasia adunca*, *Leucospermum praemorsum*, *Leucadendron procerum* and *Annessorhiza sp nov*), and the latter three all have regionally significant populations within the largest proposed development area. The only feasible mitigation for these species would be the first step in the mitigation hierarchy – complete avoidance.

No mapped CBAs will be lost within the proposed development footprint.

The loss of the High sensitivity vegetation, and the associated 4 SCC in the larger of the two focus areas (about 10.6ha) is likely to be of **High negative** botanical significance, before mitigation. The loss of the Medium sensitivity vegetation component (about 10ha) is likely to have a Low - Medium negative botanical impact.

Primary required mitigation in this case would be modifying the development footprint to avoid all the mapped areas of High botanical sensitivity (which include all 4 SCC), and this has been done, as per the green polygons in Figure 2. This avoidance

mitigation is enough to reduce the direct botanical impacts of the development to Low - Medium negative.

<u>Alternative</u>	<u>Extent of impact</u>	<u>Duration of impact</u>	<u>Intensity</u>	<u>Probability of occurrence</u>	<u>Degree of confidence</u>	<u>Significance before mitigation</u>	<u>Significance after mitigation</u>
Two Development Areas (about 20.6ha)	Local	Permanent	High	Definite	High	High negative	Low – Medium negative
No Go alternative	Local	Unknown; possibly temporary	Neutral (but unknown)	High	Medium	Neutral	Not Applicable

Table 1: Impact table for Construction Phase botanical impacts associated with the proposed cultivation and loss of about 20.6ha of natural vegetation, plus loss of portion of local populations of at least 4 plant Species of Conservation Concern. Primary mitigation would be avoidance of all the High sensitivity areas, and reduction of the total footprint to 16.5ha.

8.2 Operational Phase Impacts

The most obvious operational phase impact is likely to be increased habitat fragmentation and loss of current terrestrial ecological connectivity across the cultivated parts of the focus areas. The overall intensity of this change is likely to be fairly low in a regional context, as no CBAs will be lost, and no essential or irreplaceable ecological corridors will be severed or interrupted, primarily because there is still fairly extensive natural habitat around the two study areas. Avoiding the High sensitivity areas will not mitigate this particular impact in any significant way.

Pesticide spray drift (especially under windy conditions often prevalent during spraying) into the adjacent natural veld is known to have a significant negative effect on the natural insect life and consequently on the pollination and seed set of various plants (Knight *et al* 2005; Pretorius 2010), and is thus likely to be an issue on most of the edges of the new development. Although its magnitude is very difficult to assess it is likely to be relatively low, at least in the areas more than 10m from the cultivated edges. Avoiding the High sensitivity areas will unfortunately in no way mitigate this particular impact.

High value standing crops such as rooibos fields obviously need to be protected from wildfires, and thus the adjacent areas of natural vegetation often also get protected from wildfire. This is likely to be a factor on this site, as the surrounding natural vegetation is both fire prone and largely fire dependant (Helme 2007; Cadman 2016). The conversion of large parts of the Bokkeveld escarpment from livestock grazing (when fire was used as a grazing management tool) to rooibos cultivation (active fire suppression) is in fact a major problem in terms of the negative impact on natural fire regimes (Helme 2007), and at least 70% of this region is now well overdue for a fire, with many areas not having been burnt for more than fifty years (pers. obs). Natural, optimal fire cycles in this area are likely to be in the order of once every 20 – 25 years, yet the vegetation on site is now well over forty years old. The negative impact on surrounding fire regimes (reduction in extent and frequency of fire) is thus likely to be one of the more significant negative botanical impacts, and is likely to be Medium negative. Avoiding the High sensitivity areas will unfortunately in no way mitigate this particular impact.

The loss of the site populations of the four recorded plant Species of Conservation Concern is likely to have a low - moderate negative impact on the metapopulations of these species, as the fewer plants may mean less successful pollination, outcrossing and seedset. This particular impact can be largely eliminated by avoiding the mapped High sensitivity areas.

Overall, combined, operational phase botanical impacts are likely to be of Medium negative significance before mitigation, and Low – Medium negative after mitigation.

<u>Alternative</u>	<u>Extent of impact</u>	<u>Duration of impact</u>	<u>Intensity</u>	<u>Probability of occurrence</u>	<u>Degree of confidence</u>	<u>Significance before mitigation</u>	<u>Significance after mitigation</u>
2 Development Areas (20.6ha)	Local	Permanent (at least for duration of cultivation)	Medium	Very likely	Medium - High	Medium negative	Low - Medium negative

No Go alternative	Local	Unknown; probably temporary	Very Low (but unknown)	Low	Medium	Neutral	Not Applicable
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Table 2: Impact table for combined Operational Phase botanical impacts associated with the 20.6ha of proposed cultivation. Impacts include habitat fragmentation, pesticide drift and disruption of natural fire regimes. Primary mitigation would be the avoidance of the mapped High sensitivity areas, as well as possible controlled burns of the natural vegetation on the property.

8.3 The No Go Alternative

The No Go alternative usually implies the continuation of the status quo. In this case there would thus be no expansion of agriculture into currently natural vegetation (that would total about 20.6ha). There is currently livestock on the property, and existing rooibos fields, and grazing is a factor in most of the property, but is generally at acceptable levels, except around kraals and fields, but increasing stock levels could damage the vegetation in many areas. The property has a low carrying capacity and this landuse would not generate any significant income. And given the general lack of compliance by landowners in many regions (pers. obs.) there is always the real possibility of illegal cultivation, without any form of authorisation or mitigation, notwithstanding the threat of a fine of up to R5m.

On balance however, the No Go scenario (assuming no illegal cultivation) is likely to have no more than a Neutral botanical and ecological impact.

8.4 Cumulative Impacts

The cumulative botanical impacts of the proposed development are understood to be broadly equivalent to the regional botanical impacts, in that the vegetation type to be impacted by the proposed development has been, and will continue to be, impacted by numerous agricultural developments and other factors (the cumulative impacts) within the region. Agricultural expansion is by far the most important factor causing habitat loss in the region (Raimondo et al 2009), and there is currently something of a boom in the fruit and rooibos producing areas, and the author is currently involved with assessment of at least 800ha of new lands in this region, which is in itself a significant cumulative impact.

Because the development footprint is only 20.6ha, and significant natural vegetation still remains on the greater property, the overall cumulative botanical impact of the proposed development is Low - Medium negative before mitigation, and Low – Medium negative after mitigation.

9. REQUIRED MITIGATION

- No development or vegetation clearing should be authorised in the areas mapped as being of High botanical sensitivity (see Figure 4).
- Up to 16.5ha of new cultivation can instead be authorised in the four areas labelled in Figure 4 as “Preferred development areas”.

10. CONCLUSIONS AND RECOMMENDATIONS

- All proposed development areas are within Nardou Sandstone Fynbos, which is considered a Vulnerable vegetation type at a national and regional level (Pence 2014).
- Four plant Species of Conservation Concern (*Metalsia adunca*, *Leucospermum praemorsum*, *Leucadendron procerum* and *Annessorhiza sp nov*) were recorded in the High sensitivity areas, and within the assessed and originally proposed development area. The loss of the site populations of these species would be regionally significant and is thus not recommended.
- All mitigation outlined in Section 9 is considered reasonable and feasible, and is factored into the assessment, and is thus considered to be essential and mandatory. It is assumed that all mitigation proposed will be effectively and timeously implemented.
- Overall construction phase botanical impacts of the proposed 20.6ha development is considered to be an unacceptable High negative before mitigation. With the proposed mitigation (reduction to 16.5ha, and excluding all High sensitivity areas) this could be reduced to an acceptable Low – Medium negative.
- Overall operational phase botanical impacts of the proposed 20.6ha development is considered to be an acceptable Medium negative before mitigation. With the proposed mitigation this could be reduced to an even more acceptable Low – Medium negative.
- It is recommended that the modified, preferred development layout, as shown in green in Figures 2 and 4, be approved.

- A Search and Rescue program for the many plants within the development areas was considered, but none of the translocatable species known to occur on the development areas are so rare that they really need to be translocated, and secondly translocation itself would further disturb the receiving areas, and thus no program has been recommended. All translocatable species within the development areas are also well represented in the remaining natural areas on the greater property.
- Strip clearing is recommended over complete clearing of the approved areas, in order to minimise wind erosion and to aid rehabilitation of the areas if or when cultivation is abandoned.
- Given that the development will be in a fire prone and fire dependant ecosystem, and that the area is well overdue for a fire, consideration should be given to undertaking a few controlled burns on the property prior to development. This will require specialist input and management, but would be very beneficial for biodiversity in the long term, and would also substantially reduce the ever increasing risk of a runaway wildfire, by reducing the available fuel load for a period of at least ten years after the fire.

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HERITAGE IMPACT ASSESSMENT

PROPOSED CULTIVATION OF ROOIBOS TEA ON FARM 951 ZONDERWATERKRAAL, NEAR NIEUWOUDTVILLE HANTAM MUNICIPALITY, NORTHERN CAPE

Assessment conducted under Section 38 (3) of the National Heritage
Resource Act (No. 25 of 1999)

Prepared for

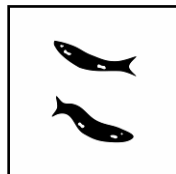
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**SEPTEMBER
2016**

EXECUTIVE SUMMARY

1. Introduction

ACRM was instructed by Footprint Environmental Services to conduct a Heritage Impact Assessment (HIA) for the proposed development of 21 ha of new Rooibos tea fields on Farm 951 Zonderwaterkraal (Hantam Municipality) near Nieuwoudtville in the Northern Cape Province.

The proposed tea fields will be located on deep sandy soils on a sloping plateau about 1.2 kms east of the Dooring River and about 50 kms south of Nieuwoudtville. Access to the farm is via Moedveloer, a gravel road that eventually connects with the R364 to Calvinia / Clanwilliam.

The establishment of the new fields entails the clearance of natural vegetation, firstly by brush cutting. 10m wide strips of vegetation are retained between the cultivated fields to serve as a refuge for beneficial insects and to provide wind breaks to prevent erosion. Cleared vegetation will either be removed from the fields and ploughed back into the soils, or moved to adjacent fields where it will decompose naturally.

2. Aim of the HIA

The overall purpose of the HIA is to assess the sensitivity of archaeological resources in the proposed new fields, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

According to consulting palaeontologist, Dr John Almond, the proposed development site / Farm 951 'are underlain by fluvial sandstones of the Rietvlei Formation (uppermost Table Mountain Group) that are of low palaeontological sensitivity'.

3. Results of the HIA

A site assessment was undertaken on the 01 September 2016, in which the following observations were made:

One broken Later Stone Age silcrete flake of *low* (Grade 3C) significance was recorded during the study.

4. Conclusion

The proposed activity will not impact on significant archaeological heritage.

No settlement sites or evidence of human occupation were found during the baseline study.

Indications are that, in terms of archaeological heritage, the proposed new fields are not a sensitive landscape.

The impact significance of the proposed development on archaeological heritage is therefore assessed as LOW.

5. Recommendations

1. No archaeological mitigation is required.
2. If any other unmarked human remains, or ostrich eggshell caches, for example, are exposed or uncovered during excavations these must immediately be reported to Heritage Western Cape (Att: Ms Natasha Higgitt 021 462 4509), or the contracted archaeologist (Jonathan Kaplan 082 321 0172).
3. The above recommendations must be incorporated into the Environmental Management Plan (EMP) for the proposed development.

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1. INTRODUCTION

ACRM was instructed by Footprint Environmental Services, on behalf of Mr G Koopman to conduct a Heritage Impact Assessment (HIA) for the proposed cultivation of new Rooibos tea fields on Farm 951 Zonderwaterkraal (Hantam Municipality), near Nieuwoudtville in the Northern Cape Province (Figures 1 & 2).

The proposed tea fields will be located on deep sandy soils on a sloping plateau about 1.2 kms east of the Doring River and about 50 kms south of Nieuwoudtville. Access to the farm is via Moedveloer, a gravel road that eventually connects with the R364 to Calvinia / Clanwilliam.

The applicant intends to expand the current Rooibos tea production potential on Farm 951 by developing an additional 21 ha of new tea fields. A limited amount of Rooibos is currently grown on the farm.

Footprint Environmental Consultants is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the assessment process.

2. THE DEVELOPMENT PROPOSAL

Two new tea fields (A & B) are planned, of which field A (18ha) is the largest (Figure 3). The establishment of the new field lands entails the clearance of natural vegetation, firstly by brush cutting. 10m wide strips of vegetation are retained between the cultivated fields to serve as a refuge for beneficial insects and to provide wind breaks to prevent erosion. Cleared vegetation will either be removed from the fields and ploughed back into the soils, or moved to adjacent fields where it will decompose naturally.

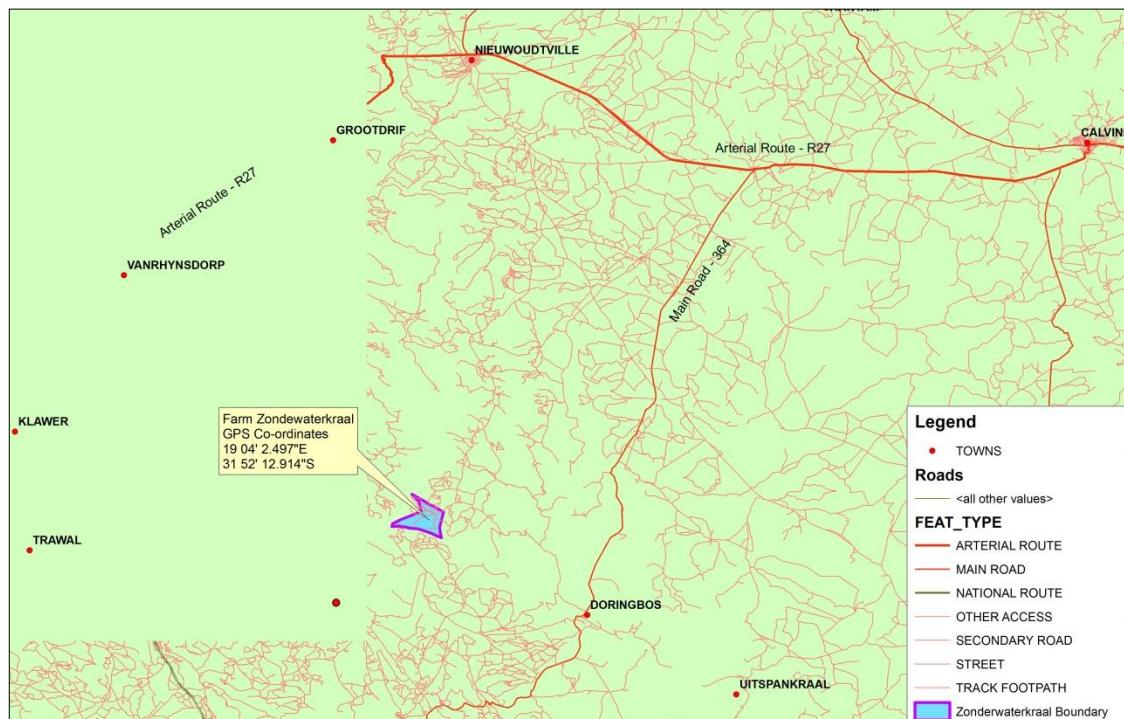


Figure 1. Locality map, Farm 951/0 Zonderwaterkraal.

Heritage Impact Assessment, proposed Rooibos tea fields, Farm 951, near Nieuwoudtville



Figure 2. Google map indicating the location of the proposed new Rooibos tea fields on Farm 951/0, Nieuwoudtville. Red polygon indicates the location of the study site



Figure 3. Zonderwaterkraal development: Proposed layout of new Rooibos tea fields (A & B)

3. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at provincial level. According to the Act (Sect. 35), it is an offence to destroy, damage, excavate, alter or remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit issued by the SAHRA or applicable Provincial Heritage Resources Agency, viz. Heritage Western Cape (HWC).

Notification of SAHRA is required for proposed developments exceeding certain dimensions (Sect. 38), upon which they will decide whether or not the development must be assessed for heritage impacts (an HIA) that may include an assessment of archaeological (a AIA) or palaeontological heritage (a PIA).

4. TERMS OF REFERENCE

The terms of reference for the study were to:

- Determine whether there are likely to be any important archaeological resources that may be impacted by the proposed development;
- Indicate any constraints that would need to be taken into account in considering the development proposal;
- Identify possible `No-Go` areas, and
- Recommend mitigation action

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

Zonderwaterkraal is located about 50 kms south of Niewoudtville. The farm is accessed via the Moedveloer road, which eventually connects with the R364 to Calvinia / Clanwilliam. The proposed new fields are located on deep, light-yellow coloured sandy soils on a sloping plateau about 1.2 kms east of the Dooring River. The affected fields slope slightly to the south, south / west, and are covered in a mix of Restio grasses, shrubs and large, mature Protea trees (Field A) with open patches of loose sandy soils. There are no significant landscape features on the proposed development sites, although a small outcropping of sandstone occurs in the northeastern portion of Field A, alongside existing fields of Rooibos tea (Figures 4-8). There is very little surface stone in the affected fields.

Surrounding land use comprises existing tea fields, and vast tracts of vacant agricultural land.



Figure 4. Proposed new Rooibos tea fields (Field A), Farm 951. View facing south west



Figure 5. Proposed new Rooibos tea fields (Field A), Farm 951. View facing west



Figure 6. Proposed new Rooibos tea fields (Field A), Farm 951. View facing south west



Figure 7. Proposed new Rooibos tea fields (Field B), Farm 951. View facing south



Figure 8. Proposed new Rooibos tea fields (Field B), Farm 951. View facing north

6. STUDY APPROACH

6.1 Method

The purpose of the HIA is to assess the sensitivity of archaeological resources in the study area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

The field assessment was undertaken by ACRM on 01 September 2016. The position of identified archaeological resources, were plotted using a hand held GPS unit set on the map datum wgs 84.

A track path of the survey was also captured. A literature survey was carried out to assess the heritage context surrounding the proposed development site.

According to consulting palaeontologist, Dr John Almond (email correspondence dated 21 November 2015), the proposed development site / Farm 951 `is underlain by fluvial sandstones of the Rietvlei Formation (uppermost Table Mountain Group) that are of low palaeontological sensitivity`.

6.3 Constraints and limitations

While vegetation cover was sometimes quite thick on the ground, there were no constraints or limitations associated with the study. Mobility over the site was fairly easy.

6.4 Identification of potential risks

The results of the study indicate there are no archaeological risks associated with the proposed development of new Rooibos tea fields.

7. ARCHAEOLOGICAL HERITAGE

In terms of archaeological heritage, the Nieuwoudtville area has not been very well documented, although one or two selective surveys have been undertaken. A few studies are listed on the SAHRIS website but these do not have any bearing on the current study. Numerous surveys have been undertaken near Loeriesfontein by this archaeologist and others, but the town is located more than 50kms north of the town.

An large number of rock art sites, including a few small artefact scatters occur at the Oorlogskloof Nature Reserve (Webley & Orton 2012, & personnel observation) a few kilometers outside Nieuwoudtville, alongside the R27 just before one enters the village, while rock art sites also occur on the Farms Paapkuilsfontein and Sewefontein about 25kms south of the town (personnel observation). Dispersed scatters of Later Stone Age remains, and isolated Middle Stone Age implements have also been found by this archaeologist at Sewefontein.

Hollmann (1993) did a survey of rock paintings in the Koebee River Valley, a tributary of the Doorn River, located to the south of Oorlogskloof, near Nieuwoudtville, while Humphreys *et al* (1991) have described rock art sites to the east of the Koebee River. At Oorlogskloof, Hollmann (1993) describes paintings of eland hartebeest, fat-tailed sheep scratches, palettes and handprints. Amschwand (2009) describes stone walling in the Onder Bokkeveld “which may indicate the presence of pastoralists”, as well as pottery and rock art considered to be of Khoekhoen origin.

According to Webley and Orton (2012), Khoisan presence in the ‘Onder Bokkeveld’ in the 1720s and 1730s discouraged early colonial settlement. In 1739 a Boer commando attacked Captain Jantje Klipheuwel’s farm in the Bokkeveld. At least 13 Khoisan were killed during this raid. The place was subsequently named “Oorlogskloof” – a name it retains to this day. The commando continued to scour the Bokkeveld for any further kraals. A kraal was later attacked near Doorn River and 17 Khoisan were killed. These tactics eventually put an end to an independent Khoisan existence in the Bokkeveld. The trekboers later moved into the Onder Bokkeveld and by 1770s the Bokkeveld was completely settled by white colonists (Webley & Orton 2012; Penn 2005).

8. FINDINGS

One broken silcrete flake (Site 661 GPS reading 31°52'5.04"S 19° 3'11.04"E), was located in Field A, while no archaeological heritage was encountered in Field B (Figure 9).

No graves or typical grave markers were found.

Grading of the archaeological resources: *low* (Grade 3C)



Figure 9. Google satellite map of the proposed Rooibos fields (A & B) on Farm 951. Blue lines are track paths. Note the surrounding tea fields

9. CONCLUSION

The proposed activity (i. e. cultivation of new Rooibos tea fields) is not likely to impact on significant archaeological heritage.

No settlement sites or evidence of human occupation were found during the study of the affected landholdings.

Indications are that, in terms of archaeological heritage, the proposed new fields are not a sensitive landscape.

The impact significance of the proposed development on important archaeological heritage is therefore assessed as LOW.

10. RECOMMENDATIONS

With regard to the proposed development of new Rooibos tea fields on Farm 951 Zonderwaterkraal near Nieuwoudtville, the following recommendations are made:

1. No mitigation is required prior to development activities commencing.
2. If any other unmarked human remains, or ostrich eggshell caches, for example, are exposed or uncovered during excavations these must immediately be reported to Heritage Western Cape (Att: Ms Natasha Higgitt 021 462 4509), or the contracted archaeologist (Jonathan Kaplan 082 321 0172).
3. The above recommendations must be incorporated into the Environmental Management Plan (EMP) for the proposed development

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ROOIBOS SOIL REPORT

COMPLETE SOIL INVESTIGATION SURVEY TO ASCERTAIN THE SUITABILITY FOR THE CULTIVATION OF VIRGIN SOIL FOR THE PRODUCTION OF ROOIBOS TEA AT SONDERWATERKRAAL AND TWEERIVIER, NIEUWOUDTVILLE AREA, NORTHERN CAPE PROVINCE.

CONTRACT: NC/DALLET/0128, PROJECT NR: 31630



3 DECEMBER 2014



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INTRODUCTION AND BACKGROUND

BVi Consulting Engineers was appointed to do a complete soil investigation at Sonderwaterkraal and Tweerivier, near Nieuwoudtville in the Northern Cape Province. The purpose of the investigation is to ascertain the suitability of virgin soil for the production of rooibos tea.

Originally approximately 26ha was identified for the soil investigation. However after consultation with the Department of Agriculture and local community members, approximately 39ha was identified and investigated. The proposed development consists of 2 areas at Sonderwaterkraal and 3 areas at Tweerivier.

The proposed area was surveyed, and profile pits were set out on a 100m x 100m grid. The profile pits were prepared by a local contractor and filled-up after completion of the soil pit investigation.

BVi requested the services of Digital Soils Africa, under direction of Dr Pieter le Roux to assist with the soil investigation. Dr le Roux is very well known in the field of soil science and is an expert in this area.

The field work was completed in September, where after the chemical analysis and reporting was done.

Please find attached the complete soil report for Sonderwaterkraal and Tweerivier. The contour map is also available in electronic format.

I trust that the report provides the necessary information as required. Please contact me should you require any further information.



M. PRETORIUS Pr. Eng.

Soil Suitability for Rooibos Tea Production

A soil survey to ascertain the suitability for cultivation of virgin soil for the production of Rooibos tea at Tweerivier and Sonderwaterkraal, Nieuwoudtville area, Northern Cape Province.

EXECUTIVE SUMMARY

The sandy, acid Clovelly soils of these farms are suitable for production of Rooibos Tea and meet all the norms of the Department. Lack of research on the required soil water regime expressed in soil depth x rainfall requirements of Rooibos Tea, the minimum soil depth was set at 1 m. This boundary should be applied cautiously as the soils has a morphology indicating a wet subsoil that can store water and is getting interflow water from upslope. Rooibos Tea is drought resistant and recorded to grow wild on very shallow soils. Areas indicated as suitable have a relatively wet soil water regime. It stores water deep with limited soil evaporation (because it is sand), it stores draining water in the deep subsoil and make it available between rain events (as the underlying sandstone is impermeable) and receive water from higher lying Mispah soils (water flows on the impermeable layer).

The climate is suitable. The farms are close to the scarp and higher rain is expected here. Rainfall is expected to drop drastically and temperatures to rise, lowering effective rain, to the inland. It also explains why the farms are on the edge of the Rooibos Tea production area. Rooibos Tea grows wild on the sites and shows vitality in spite of being harvested regularly for “Wild Rooibos Tea” which has a very high market value. The two farmers currently produce organic Rooibos Tea as a sole and main income respectively.

Potential degradation hazards are soil compaction by mechanical operations and wind erosion. These limitations need to be addressed right from the beginning.

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1. INTRODUCTION

Soil surveys are important for effective planning and optimization of land use, decreasing the risk of land degradation and increasing the benefit of effective management. Soil suitability for dry land cropping is very dependent on soil type, effective depth and intended crop, with different scenarios requiring a different management practice for optimized results.

The main objective was to map the soils Sonderwaterkraal and Tweerivier and interpret the morphology, chemistry in terms of suitability for Rooibos Tea production. The properties limiting the suitability of the soils and precautionary measures normally recommended for sustained use will also be given.

1.1. Site Description

Sonderwaterkraal and Tweerivier is situated roughly 55 km south of Nieuwoudtville, Northern Cape Province (Figure 1.1).

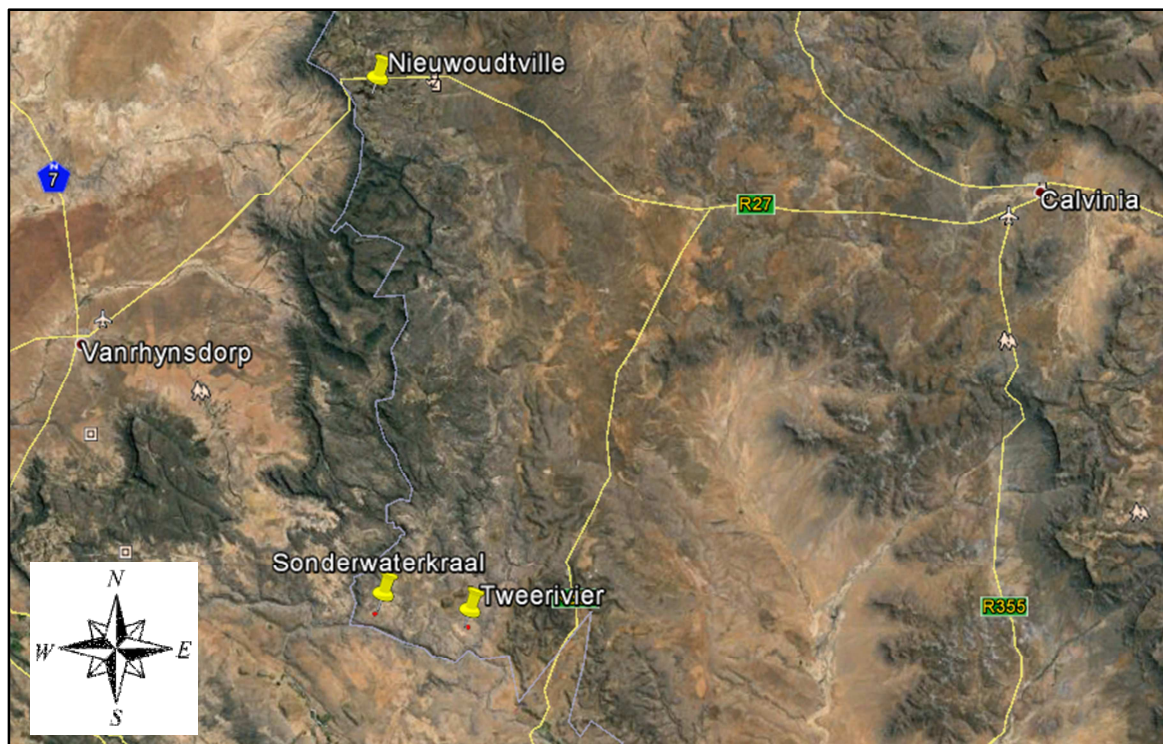


Figure 1.1 Location of Sonderwaterkraal and Tweerivier, Northern Cape Province.

Nieuwoudtville has a Mediterranean climate, receiving most of the 250 m.a.p. in the winter (Figure 1.2). The rainfall peaks in June, July and August, with the least rain in December, January and

February. The average monthly temperatures are seen in Figure 1.3. The average daily temperatures range from 30.1 C in summer to 17 C in in winter.

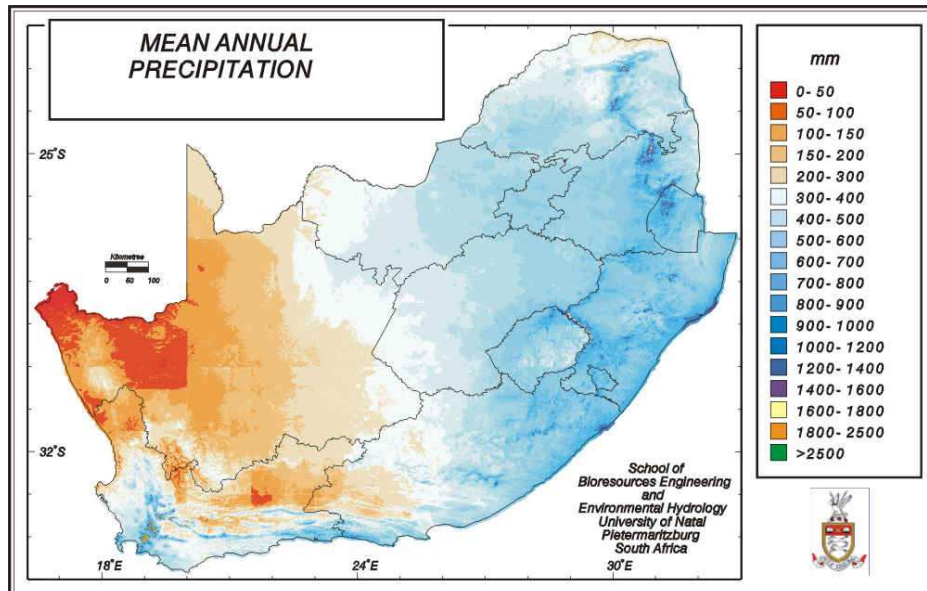


Figure 1.2 Mean Annual Precipitation of South Africa

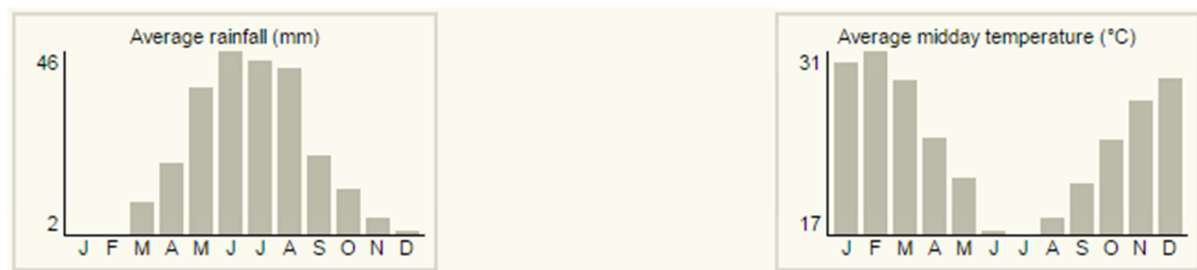


Figure 1.3 Average monthly rainfall and midday temperatures of Nieuwoudtville.

2. METHODOLOGY

The survey consisted of 44 profiles, the procedure included the identification and demarcation of master horizons. Diagnostic horizons were described and classified according to Soil Classification Working Group (1991). Samples were taken from representative soil profiles from each diagnostic horizon. pH was measured using 1.0 N KCl extract at 1:2.5 ration. The P content was measured using a spectrophotometer and a Bray I extract 1:7.5 ratio. Two methods were used in determining the cation concentrations. Firstly the soil was leached with Ammonium Acetate extract with a 1:10 ratio and Trace elements were calculated by an 0.1 N HCl extract at a 1:2.5 ratio. Secondly cations were determined by the Mehlich III extract with a 1:10 ratio. The CEC was determined by saturation of

Ammonium Acetate and extracted by 1.0 N KCL. Hydrometer was used to calculate the texture of the samples.

3. RESULTS

3.1. Soil Classification

Soil Form	Master Horizon	Diagnostic Horizon
Clovelly (Cv)	A	Orthic
	B	Yellow-brown apedal B horizon
	C	Unspecified

3.2. Morphological Properties

The Clovelly soils with slightly darkened Orthic A horizon, yellow-brown apedal B horizons as subsoil and underlying fractured rock, as is the case in these sites, are freely drained soils. Red accumulations in the fractured quartzite underlying the Clovelly varies from hardened concretions formed around quartzite fractures to hardened surfaces of quartzite fractures and soft impregnated quartzite fractures and solid rocks.

3.3. Chemical Properties

The pH of the soils varies from very strongly acidic to neutral. It is generally low throughout the profile. The K and Ca contents are low and the Na and Mg concentration very low. The CEC is extremely low due to a low clay content and humus content.

There is a difference in soil chemical properties between the two areas surveyed. There is an increase in CEC in the profiles at Sonderwaterkraal, thereby increasing cation concentration in the soil. Even with increase in chemical properties the properties are still low.

Table 1 Selected soil chemical properties.

Ref No	pH (KCl)	K	Na	Ca	Mg	CEC
		mg/kg	mg/kg	mg/kg	mg/kg	cmol(c)/kg
N1.1	4.38	37	9	70	6	0.62
N1.2	4.06	41	8	33	7	0.48
N9.1	4.59	22	8	26	5	0.21
N9.2	4.01	20	6	14	1	0.43
N18.1	4.84	40	7	35	7	0.28
N18.2	5.28	35	8	38	10	0.32
N22.1	6.31	34	13	46	12	0.40

Ref No	pH (KCl)	K	Na	Ca	Mg	CEC
N22.2	4.30	34	9	25	8	0.49
N27.1	4.51	30	6	39	13	0.36
N27.2	4.37	28	5	18	2	0.14
S15.1	5.74	121	29	1005	38	3.48
S15.2	6.20	51	241	2316	20	6.42
S15.2	6.01	31	411	2261	15	5.22
S17.1	6.29	61	8	918	24	2.46
S17.3	6.24	32	16	2381	10	8.33
S19.1	5.80	97	7	1236	30	4.67
S19.2	6.57	146	31	1970	37	5.43
S19.3	6.37	26	76	2301	10	9.21
S21.1	6.59	90	12	1708	25	6.42
S21.3	6.85	40	101	2740	15	8.32
S23.1	6.03	79	25	1319	43	5.14
S23.2	6.74	30	48	2130	15	7.76
S23.3	6.12	38	56	1612	16	4.33
S25.1	6.56	234	138	2243	76	7.28
S25.2	6.39	30	17	394	14	1.06
S25.3	6.03	34	60	2315	38	8.63
S1.1	5.38	22	8	61	6	0.31
S1.2	4.35	17	7	27	6	0.28
S7.1	4.11	19	12	37	6	0.33
S7.2	4.40	17	9	14	3	0.24
S23.1	4.47	41	16	50	12	0.51
S23.2	4.23	34	10	51	15	0.46

Table 2 General interpretation of pH ranges (Bruce & Raymond, 1982)

pH	Rating
>9	Very strongly alkaline
9 - 8.5	Strongly alkaline
8.4 - 7.9	Moderately alkaline
7.8 - 7.4	Mildly alkaline
7.3 - 6.6	Neutral
6.5 - 6.1	Slightly acid
6 - 5.6	Moderately acidic
5.5 - 5.1	Strongly acidic
5 - 4.5	Very strongly

The low chemical values are probably more a result of the very low base status rather than leaching (Table 3). The low clay contents prohibit high CEC.

Table 3 Different concentrations of Ca, Mg, Na and K in soil (Metson, 1961)

Cation	Very low	Low	Moderate	High	Very high
Ca mg/kg	0- 400	400 - 1000	1000-2000	2000-4000	>4000
Mg mg/kg	0- 35	35- 120	120- 360	360-970	>970
Na mg/kg	0- 23	23- 70	70- 160	160- 460	>460
K mg/kg	0- 80	80- 120	120- 275	275- 780	>780

3.4. Physical Properties

The clay content of the soils is very low. The difference in chemistry does not correlate with texture of the soil the soil texture is relatively similar at both sites.

Table 4 Particle size distribution and textural class

Ref No	Clay (%)	Silt(%)	Sand(%)	Texture class
	8	2	90	Sand
N1.1	8	2	90	Sand
N1.2	8	2	90	Sand
N9.1	8	2	90	Sand
N9.2	8	2	90	Sand
N18.1	8	2	90	Sand
N18.2	8	2	90	Sand
N22.1	8	2	90	Sand
N22.2	8	2	90	Sand
N27.1	8	2	90	Sand
N27.2	8	3	89	Sand
S15.1	8	5	87	Sand
S15.2	10	5	85	Sand
S15.2	6	4	90	Sand
S17.1	10	10	80	Loamy Sand
S17.3	6	2	90	Sand
S19.1	8	2	90	Sand
S19.2	10	8	82	Loamy Sand
S19.3	6	3	91	Sand
S21.1	10	6	84	Loamy Sand
S21.3	6	5	89	Sand
S23.1	6	9	85	Sand
S23.2	8	5	87	Sand
S23.3	8	8	84	Loamy Sand
S25.1	6	4	90	Sand
S25.2	8	6	86	Sand
S25.3	8	2	90	Sand
S1.1	8	2	90	Sand
S1.2	8	14	78	Loamy Sand

Ref No	Clay (%)	Silt(%)	Sand(%)	Texture class
S7.1	8	2	90	Sand
S7.2	8	2	90	Sand
S23.1	8	2	90	Sand
S23.2	6	4	90	Sand

4. SUITABILITY FOR ROOIBOS TEA PRODUCTION

4.1. Environmental indicators

Both farmers are cultivating Rooibos Tea on their farms as a primary income. Wild Rooibos Tea plants are growing on the areas delineated for potential cultivation. The farms are on the edge of the scarp expected to get more rain than the inland plato.

4.2. Soil morphology

The deep, sandy Clovelly soil with some oxidation morphology in the saprolite is suitable for dryland cropping of Rooibos Tea. The depth criterion should be applied with care as the soil stores large amounts of water in the deep subsoil.

The texture of the soils are sandy and will therefore water infiltration during rain will be high, enhancing the effectivity of rain. The rain water will also be stored deep in the subsoil limiting soil evaporation. The water holding capacity is limited by the sandy nature of the soil but the soil depth and impermeable underlying quartzitic sandstone stores large amounts of water. Redoximorphic features in the fractured rock are an indication that water accumulates on underlying impermeable rock. Due to the slope of the land the water table forming in the fractured rock, water will flow down slope in the deep subsoil and fractured rock. This water will be available for established crops and increase production.

4.3. Soil chemistry

The acidic, leached sand is typical of the soils of the area where Rooibos are cultivated (Lötter & Maitre, 2014).

4.4. Soil fertility

The intention of the farmers is to do organic farming excluding fertilisation of any kind.

4.5. Agronomic potential

No research results are available to guide evaluation of soil analysis for Rooibos Tea. It grows under annual rainfall as low as 250 mm and soils as shallow as 70mm (Lötter & Maitre, 2014). Roots grow deeper than 2m. It requires well drained sandy soil with pH between 4.5 en 5.5 and low P levels of less than 25 ppm. The area is climatically marginal.

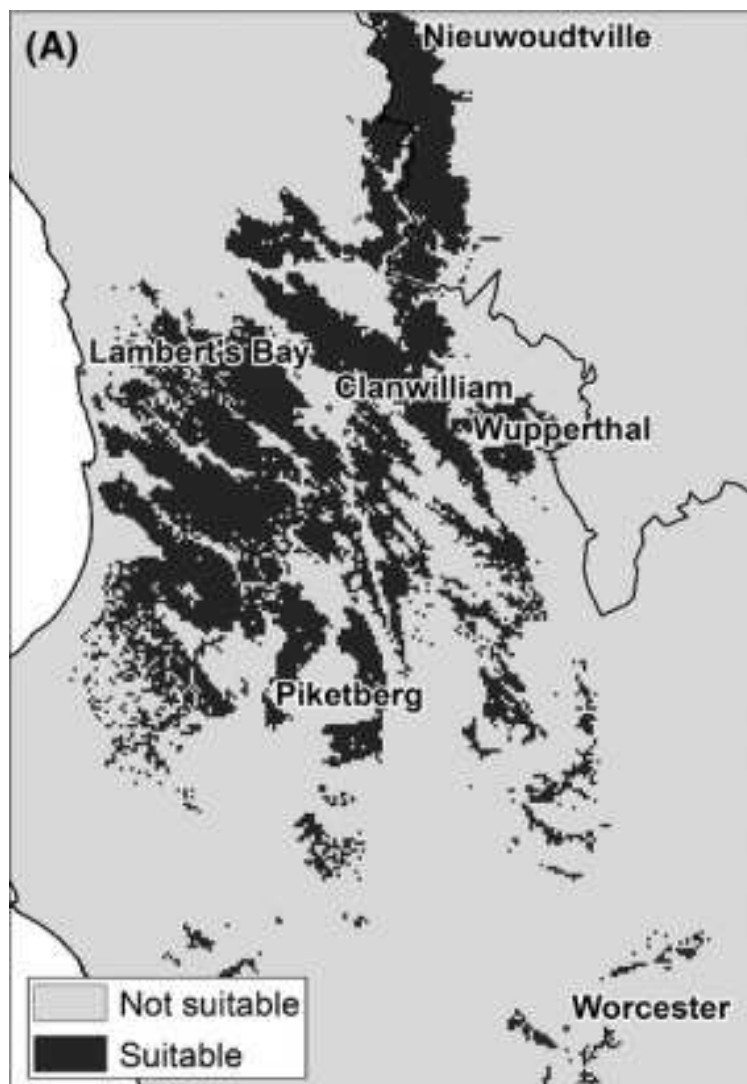


Figure 4.5 Suitability areas for Rooibos Tea (Lötter & Maitre, 2014).

5. MAPS

Soil class and depth maps for five areas are presented, three for Tweerivier (N1, N2 and N3) (Figures 5.1 and 5.2) and two for Sonderwaterkraal (S1 and S2) (Figures 5.3 and 5.4).

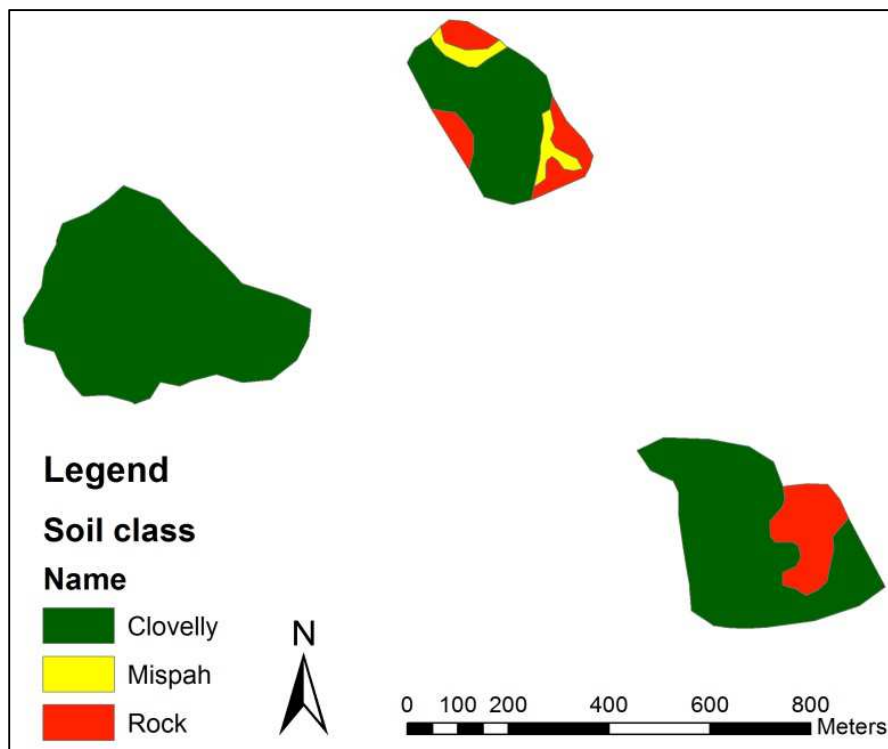


Figure 5.1: Soil class map for the three areas of Tweerivier farm

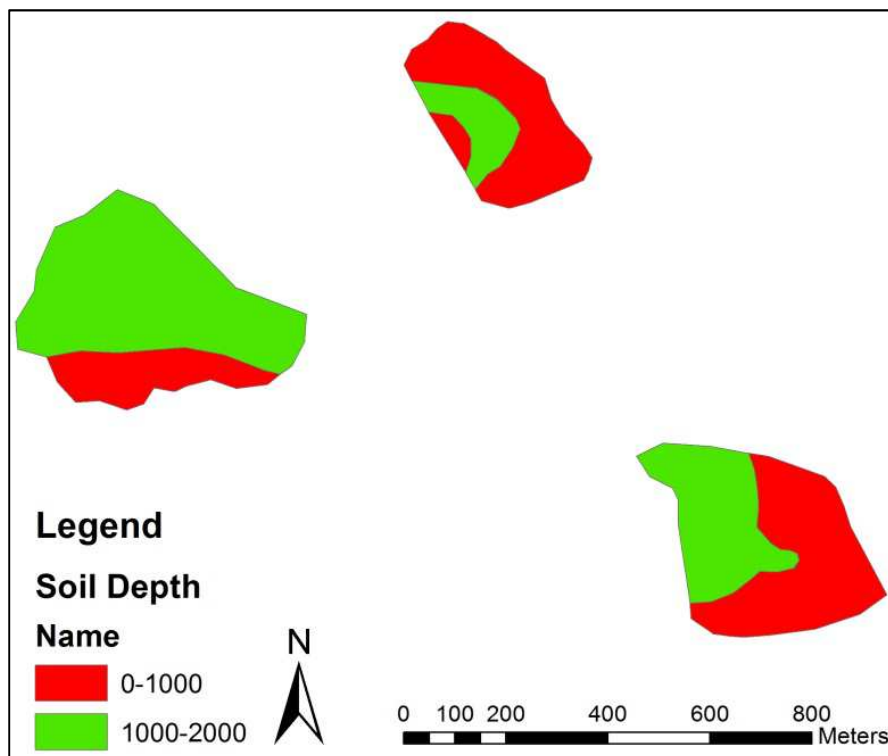


Figure 5.2: Soil depth map for the three areas of Tweerivier farm

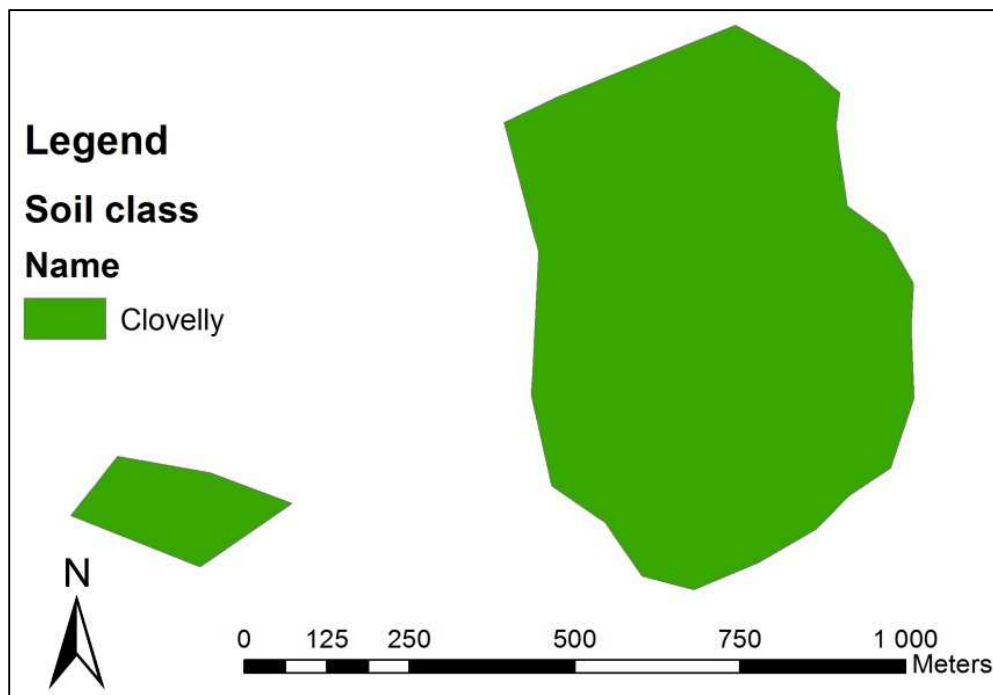


Figure 5.3: Soil class map for the two areas of Sonderwaterkraal

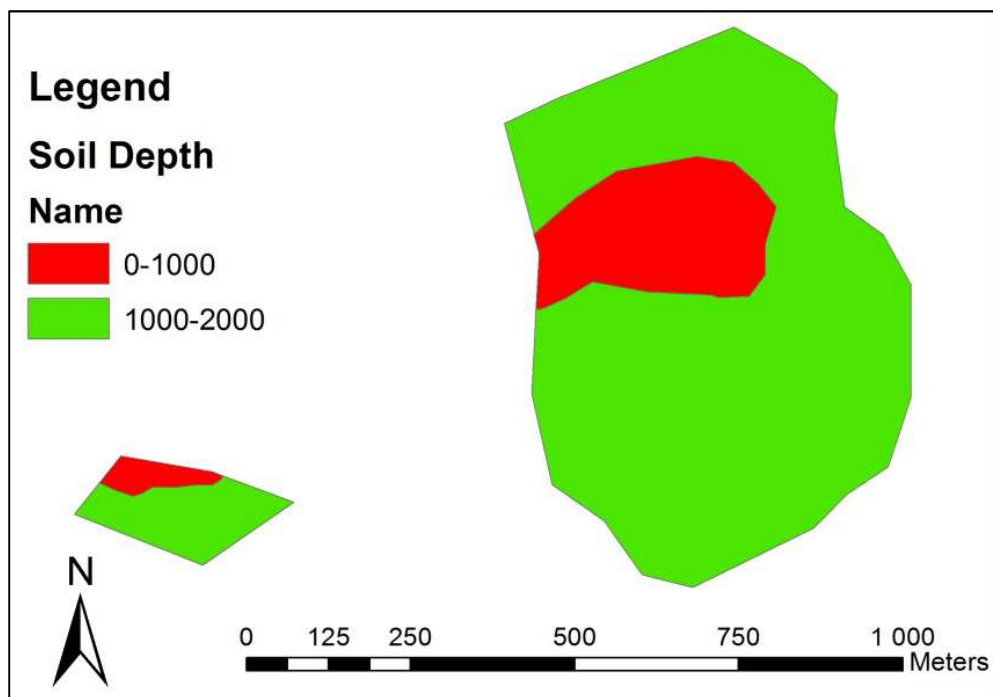


Figure 5.4: Soil depth map for the two areas of Sonderwaterkraal

6. RECOMMENDATIONS

Both farmers currently produce organic Rooibos Tea as a main income. This implies that the climate is suitable. Rooibos Tea grows wild on the sites earmarked for cropping. The farms are close to the edge of the scarp suggesting a localised high rainfall.

The Clovelly soils of these farms are suitable for production of Rooibos Tea and meet all the norms of the Department. Lack of research on the depth x climate requirement of Rooibos Tea the minimum soil depth was set at 1 m. This should be applied cautiously as the soils are getting interflow water from upslope and the crop is drought resistant. The terrain is shelving and the transition from 1m deep Clovelly soils to Mispah soils and rock outcrops quite narrow.

Areas indicated as suitable have a relatively wet soil water regime. It stores water in the deep subsoil and receive water from higher lying soils. Although the farms are on the boundary of the Rooibos Tea production area and reliable climate data is not available, the soils indicate relatively wet conditions.

7. REFERENCES

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Appendix 1

Modal profile Description and photograph

Profile No	S2	Soil type	Clovelly (Cv)			Soil Family	Setlagole (3100)		
Latitude	19.13477472					Slope	0		
Longitude	-31.89081545					Planform curvature	VV		
Surface stoniness	Very few					Profile curvature	VV		
Chemical weathering	Subsoil					TMU	1		
Parent material	In situ weathering sandstone					Occurrence of Flooding	No		
Geology	Sandstone					Vegetation	Shrub		
Master Horizon	Depth (mm)	Diagnostic Horizon	Transition	Structure			Soil Colour	Mottling	Comment
				Type	Size	Grade			
A	0-80	ot	Clear	Apedal	Single grain	-	7.5 YR 6/4 (Dry) 7.5 YR 5/4 (Wet)	None	-
B	80-3000	ye	-	Apedal	Single grain	-	7.5 YR 6/4 (Dry) 7.5 YR 5/4 (Wet)	None	



Photograph of modal profile (N2)

Appendix 2

Soil observations

Sonderwaterkraal					Tweerivier				
Obs	Latitude	Longitude	Soil type	Depth (mm)	Obs	Latitude	Longitude	Soil type	Depth (mm)
S1	19.04735	-31.86818611	Cv	1200	N1	19.13312	-31.8895528	Cv	500
S2	19.04592778	-31.86856944	Cv	2000	N3	19.13465	-31.8897722	Cv	800
S3	19.04502778	-31.86808333	Cv	2000	N4	19.1337	-31.89025	Cv	1200
S4	19.04545833	-31.86747222	Cv	1000	N6	19.13521	-31.8905972	Cv	700
S5	19.04643333	-31.86771944	Cv	500	N7	19.13574	-31.8913583	Ms	200
S6	19.05186111	-31.86588889	Cv	600	N8	19.13492	-31.8918	Cv	500
S7	19.05236111	-31.86666389	Cv	2000	N9	19.13842	-31.8977694	Cv	1500
S8	19.05289167	-31.86748611	Cv	2000	N10	19.13881	-31.898625	Cv	1300
S9	19.05353889	-31.86816667	Cv	2000	N11	19.13902	-31.8995111	Cv	550
S10	19.05433333	-31.86775278	Cv	2000	N12	19.14008	-31.8992056	Cv	950
S11	19.05474167	-31.86654167	Cv	2000	N14	19.13974	-31.8982444	Cv	1000
S12	19.055175	-31.86530833	Cv	2000	N16	19.1407	-31.8980472	Cv	600
S13	19.05558333	-31.86605833	Cv	2000	N17	19.1411	-31.8988444	Cv	650
S14	19.05445278	-31.86577778	Cv	2000	N18	19.13904	-31.8974083	Cv	1200
S15	19.05453333	-31.86447778	Cv	1600	N19	19.13875	-31.8971139	Cv	1500
S16	19.05365556	-31.86503889	Cv	450	N20	19.1384	-31.896625	Cv	1800
S18	19.05296389	-31.86539444	Cv	2000	N21	19.13754	-31.8968361	Cv	1800
S19	19.05338889	-31.86631111	Cv	2000	N22	19.12729	-31.8943722	Cv	2000
S20	19.05391314	-31.86689736	Cv	2000	N23	19.12827	-31.8943731	Cv	2000



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S21	19.0514186	-31.86782334	Cv	600	N24	19.12935	-31.8942361	Cv	2000
S22	19.05179722	-31.863875	Cv	2000	N25	19.12939	-31.8950833	Cv	600
S23	19.05236944	-31.86316389	Cv	1200	N26	19.12828	-31.8951722	Cv	400
S24	19.05288611	-31.86246944	Cv	2000	N27	19.13448	-31.8918028	Cv	800
S25	19.05393889	-31.86290278	Cv	450					
S26	19.05325278	-31.86368889	Cv	2000					

Appendix 3

Table 1 Soil chemical properties with Ammonium Acetate extraction results

Ref No	pH (KCl)	PBray1	K	Na	Ca	Mg	EA.KCl	%Ca	%Mg	%K	%Na	ACID SAT
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	cmol(c)/kg	%	%	%	%	%
N1.1	4.38	3	37	9	70	6	0.37	38.94	5.12	10.67	4.33	40.94
N1.2	4.06	3	41	8	33	7	0.31	24.77	8.13	15.76	5.36	45.98
N9.1	4.59	9	22	8	26	5	0.00	49.94	16.19	21.36	12.52	0.00
N9.2	4.01	9	20	6	14	1	0.43	11.74	1.41	8.80	4.26	73.79
N18.1	4.84	2	40	7	35	7	0.00	47.44	16.30	27.61	8.65	0.00
N18.2	5.28	7	35	8	38	10	0.00	47.70	21.39	22.42	8.49	0.00
N22.1	6.31	5	34	13	46	12	0.00	49.22	20.46	18.27	12.04	0.00
N22.2	4.30	4	34	9	25	8	0.19	24.79	12.92	17.06	7.54	37.69
N27.1	4.51	5	30	6	39	13	0.00	48.39	25.55	19.15	6.91	0.00
N27.2	4.37	10	28	5	18	2	0.00	44.30	9.66	34.83	11.21	0.00
S15.1	5.74	5	121	29	1005	38	0.00	87.03	5.37	5.38	2.21	0.00
S15.2	6.20	1	51	241	2316	20	0.00	89.60	1.29	1.01	8.10	0.00
S15.2	6.01	1	31	411	2261	15	0.00	85.04	0.92	0.59	13.45	0.00
S17.1	6.29	7	61	8	918	24	0.00	92.24	3.96	3.13	0.67	0.00
S17.3	6.24	1	32	16	2381	10	0.00	98.06	0.70	0.68	0.56	0.00
S19.1	5.80	6	97	7	1236	30	0.00	92.13	3.70	3.68	0.49	0.00
S19.2	6.57	2	146	31	1970	37	0.00	92.43	2.82	3.50	1.25	0.00
S19.3	6.37	1	26	76	2301	10	0.00	95.98	0.70	0.54	2.77	0.00
S21.1	6.59	4	90	12	1708	25	0.00	94.60	2.25	2.56	0.59	0.00
S21.3	6.85	1	40	101	2740	15	0.00	95.39	0.84	0.71	3.06	0.00
S23.1	6.03	3	79	25	1319	43	0.00	90.87	4.85	2.77	1.51	0.00
S23.2	6.74	1	30	48	2130	15	0.00	96.28	1.12	0.70	1.90	0.00
S23.3	6.12	1	38	56	1612	16	0.00	94.45	1.54	1.13	2.87	0.00

Ref No	pH (KCl)	PBray1	K	Na	Ca	Mg	EA.KCl	%Ca	%Mg	%K	%Na	ACID SAT
S25.1	6.56	12	234	138	2243	76	0.00	86.04	4.76	4.59	4.60	0.00
S25.2	6.39	3	30	17	394	14	0.00	88.15	5.02	3.45	3.37	0.00
S25.3	6.03	1	34	60	2315	38	0.00	94.62	2.54	0.72	2.13	0.00
S1.1	5.38	5	22	8	61	6	0.00	68.33	11.41	12.27	7.98	0.00
S1.2	4.35	7	17	7	27	6	0.24	27.76	9.25	9.05	5.97	47.96
S7.1	4.11	2	19	12	37	6	0.19	35.26	9.94	9.32	9.61	35.87
S7.2	4.40	3	17	9	14	3	0.19	19.31	5.65	11.61	10.41	53.01
S23.1	4.47	4	41	16	50	12	0.18	35.70	13.81	15.02	9.81	25.66
S23.2	4.23	14	34	10	51	15	0.12	40.63	20.19	13.69	6.64	18.85

Ref No	Ca:Mg	(Ca+Mg)/K	Mg:K	S-Value	Na:K	T	Density	S AmAc	CEC
	1.5-4.5	10.0-20.0	3.0-4.0	cmol(+)/kg		cmol(c)/kg	g/cm ³	mg/kg	cmol(c)/kg
N1.1	7.60	4.13	0.48	0.53	0.41	0.89	1.49	5.06	0.62
N1.2	3.05	2.09	0.52	0.36	0.34	0.67	1.53	3.03	0.48
N9.1	3.09	3.10	0.76	0.26	0.59	0.26	1.56	2.46	0.21
N9.2	8.32	1.49	0.16	0.15	0.48	0.58	1.56	3.46	0.43
N18.1	2.91	2.31	0.59	0.37	0.31	0.37	1.51	1.73	0.28
N18.2	2.23	3.08	0.95	0.40	0.38	0.40	1.55	1.78	0.32
N22.1	2.41	3.81	1.12	0.47	0.66	0.47	1.56	3.24	0.40
N22.2	1.92	2.21	0.76	0.32	0.44	0.51	1.56	2.32	0.49
N27.1	1.89	3.86	1.33	0.40	0.36	0.40	1.54	1.57	0.36
N27.2	4.58	1.55	0.28	0.21	0.32	0.21	1.54	3.14	0.14
S15.1	16.19	17.18	1.00	5.77	0.41	5.77	1.45	0.70	3.48
S15.2	69.49	89.68	1.27	12.92	7.99	12.92	1.68	10.37	6.42
S15.2	92.31	146.05	1.57	13.29	22.85	13.29	1.55	61.46	5.22

Ref No	Ca:Mg	(Ca+Mg)/K	Mg:K	S-Value	Na:K	T	Density	S AmAc	CEC
S17.1	23.30	30.70	1.26	4.97	0.21	4.97	1.53	4.79	2.46
S17.3	139.51	145.95	1.04	12.14	0.83	12.14	1.50	5.38	8.33
S19.1	24.88	26.03	1.01	6.71	0.13	6.71	1.63	4.70	4.67
S19.2	32.80	27.21	0.80	10.66	0.36	10.66	1.64	4.55	5.43
S19.3	136.71	177.44	1.29	11.99	5.08	11.99	1.54	8.58	9.21
S21.1	41.97	37.77	0.88	9.03	0.23	9.03	1.64	5.43	6.42
S21.3	114.02	136.06	1.18	14.36	4.33	14.36	1.54	9.24	8.32
S23.1	18.74	34.57	1.75	7.26	0.54	7.26	1.62	1.64	5.14
S23.2	85.93	138.81	1.60	11.06	2.70	11.06	1.65	5.17	7.76
S23.3	61.26	84.70	1.36	8.53	2.53	8.53	1.56	8.34	4.33
S25.1	18.06	19.77	1.04	13.04	1.00	13.04	1.49	10.49	7.28
S25.2	17.54	27.02	1.46	2.24	0.98	2.24	1.44	0.40	1.06
S25.3	37.32	135.63	3.54	12.23	2.97	12.23	1.58	5.85	8.63
S1.1	5.99	6.50	0.93	0.45	0.65	0.45	1.60	3.29	0.31
S1.2	3.00	4.09	1.02	0.25	0.66	0.49	1.59	2.22	0.28
S7.1	3.55	4.85	1.07	0.33	1.03	0.52	1.53	3.68	0.33
S7.2	3.42	2.15	0.49	0.17	0.90	0.37	1.57	2.57	0.24
S23.1	2.58	3.30	0.92	0.52	0.65	0.70	1.52	4.24	0.51
S23.2	2.01	4.44	1.47	0.51	0.49	0.63	1.56	2.70	0.46

Table 2 Mehlich III results

Ref No	Ref No	P	K	Na	Ca	Mg	EA.KCl	%Ca	%Mg	%K	%Na	ACID SAT
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	cmol(c)/kg	%	%	%	%	%
N1.1	N1.1	6	41	11	115	11	0.37	48.44	7.75	8.86	4.03	30.93
N1.2	N1.2	6	45	13	70	15	0.31	36.85	12.82	12.06	5.98	32.29
N9.1	N9.1	8	23	7	28	8	0.00	47.62	21.73	20.15	10.50	0.00
N9.2	N9.2	7	22	7	21	4	0.43	16.03	5.60	8.61	4.41	65.36
N18.1	N18.1	3	43	7	41	11	0.00	46.54	21.16	25.20	7.10	0.00
N18.2	N18.2	9	38	7	38	14	0.00	44.19	26.33	22.70	6.78	0.00
N22.1	N22.1	7	34	13	58	19	0.00	48.89	26.69	14.82	9.60	0.00
N22.2	N22.2	3	39	10	39	12	0.19	30.69	16.16	15.76	7.05	30.34
N27.1	N27.1	7	32	9	57	21	0.00	49.16	29.67	14.24	6.93	0.00
N27.2	N27.2	13	31	7	27	7	0.00	44.91	19.22	26.26	9.61	0.00
S15.1	15.1	48	134	30	1193	84	0.00	83.68	9.70	4.81	1.82	0.00
S15.2	15.2	12	54	253	3479	55	0.00	91.15	2.37	0.72	5.76	0.00
S15.2	15.2	11	36	423	4286	46	0.00	90.27	1.59	0.39	7.75	0.00
S17.1	17.1	21	65	14	1822	71	0.00	91.85	5.86	1.68	0.61	0.00
S17.3	17.3	9	35	19	13575	47	0.00	99.18	0.57	0.13	0.12	0.00
S19.1	19.1	31	92	11	1476	80	0.00	88.71	7.91	2.83	0.56	0.00
S19.2	19.2	14	154	26	2632	75	0.00	92.11	4.32	2.76	0.80	0.00
S19.3	19.3	10	26	79	5144	36	0.00	97.33	1.12	0.25	1.30	0.00
S21.1	21.1	20	86	14	2180	65	0.00	93.07	4.54	1.88	0.51	0.00
S21.3	21.3	7	43	92	3482	39	0.00	95.46	1.75	0.60	2.19	0.00
S23.1	23.1	21	76	23	1439	73	0.00	88.95	7.40	2.40	1.25	0.00
S23.2	23.2	8	35	45	2687	37	0.00	95.79	2.16	0.64	1.41	0.00
S23.3	23.3	10	40	59	2264	42	0.00	94.16	2.85	0.86	2.13	0.00
S25.1	25.1	39	244	142	2880	153	0.00	85.24	7.41	3.69	3.65	0.00
S25.2	25.2	16	40	23	826	54	0.00	86.53	9.24	2.17	2.06	0.00

Ref No	Ref No	P	K	Na	Ca	Mg	EA.KCl	%Ca	%Mg	%K	%Na	ACID SAT
S25.3	25.3	6	46	49	2502	69	0.00	93.30	4.22	0.88	1.60	0.00
S1.1	S1.1	4	19	9	80	12	0.00	68.54	16.25	8.54	6.67	0.00
S1.2	S1.2	9	20	8	38	9	0.24	32.25	12.98	8.68	6.20	39.89
S7.1	S7.1	2	16	8	31	8	0.19	31.94	13.56	8.53	7.16	38.81
S7.2	S7.2	2	21	10	29	7	0.19	29.60	11.29	10.97	8.49	39.64
S23.1	S23.1	5	46	14	57	15	0.18	37.25	15.88	15.44	7.80	23.63
S23.2	S23.2	16	34	11	93	22	0.12	51.70	20.29	9.67	5.25	13.08

Continued

Ref No	Ca:Mg	(Ca+Mg)/K	Mg:K	S-Value	Na:K	T	Density	Fe	Mn	Cu	Zn	S	B	Al
	1.5-4.5	10.0-20.0	3.0-4.0	cmol(+)/kg		cmol(c)/kg	g/cm ³			mg/kg				
N1.1	6.25	6.34	0.87	0.82	0.45	1.18	1.49	46.62	2.99	0.15	0.32	4.80	0.25	136.03
N1.2	2.87	4.12	1.06	0.65	0.50	0.95	1.53	36.70	4.56	0.30	0.28	4.90	0.24	131.53
N9.1	2.19	3.44	1.08	0.29	0.52	0.29	1.56	29.73	1.74	0.11	0.20	3.57	0.29	124.64
N9.2	2.86	2.51	0.65	0.23	0.51	0.65	1.56	32.85	0.49	0.09	0.14	2.98	0.24	134.07
N18.1	2.20	2.69	0.84	0.44	0.28	0.44	1.51	24.45	2.89	0.09	0.27	3.80	0.32	86.16
N18.2	1.68	3.11	1.16	0.43	0.30	0.43	1.55	31.39	0.99	0.07	0.09	2.27	0.23	128.40
N22.1	1.83	5.10	1.80	0.59	0.65	0.59	1.56	48.52	3.18	0.06	0.15	3.88	0.24	107.02
N22.2	1.90	2.97	1.03	0.44	0.45	0.63	1.56	47.01	0.44	0.09	0.13	4.04	0.26	88.38
N27.1	1.66	5.53	2.08	0.58	0.49	0.58	1.54	24.30	7.18	0.22	0.42	3.11	0.27	132.98
N27.2	2.34	2.44	0.73	0.30	0.37	0.30	1.54	32.87	1.92	0.10	0.14	3.08	0.24	189.13
S15.1	8.63	19.43	2.02	7.13	0.38	7.13	1.45	38.35	33.22	0.92	0.34	5.06	0.34	235.01
S15.2	38.44	129.95	3.29	19.09	8.00	19.09	1.68	15.25	27.62	1.08	0.23	11.75	0.36	124.59
S15.2	56.65	236.86	4.11	23.74	19.98	23.74	1.55	3.27	6.23	0.46	0.34	82.13	0.82	3.61
S17.1	15.68	58.28	3.49	9.92	0.37	9.92	1.53	19.46	17.10	0.57	0.37	11.36	0.41	84.92
S17.3	174.50	760.56	4.33	68.44	0.92	68.44	1.50	3.55	5.49	0.80	0.35	19.77	0.39	4.86

Ref No	Ca:Mg	(Ca+Mg)/K	Mg:K	S-Value	Na:K	T	Density	Fe	Mn	Cu	Zn	S	B	Al
S19.1	11.22	34.16	2.80	8.32	0.20	8.32	1.63	22.90	22.18	0.65	0.31	5.85	0.33	112.99
S19.2	21.30	34.98	1.57	14.29	0.29	14.29	1.64	18.41	27.08	0.73	0.24	7.30	0.31	101.89
S19.3	87.25	386.29	4.38	26.43	5.09	26.43	1.54	2.39	4.06	0.80	0.29	21.73	0.53	4.81
S21.1	20.51	51.97	2.42	11.71	0.27	11.71	1.64	24.39	24.91	0.76	0.30	7.24	0.35	147.89
S21.3	54.63	161.21	2.90	18.24	3.63	18.24	1.54	4.09	7.18	0.80	0.25	18.39	0.51	5.63
S23.1	12.02	40.10	3.08	8.09	0.52	8.09	1.62	37.74	29.62	0.87	0.30	5.22	0.36	218.53
S23.2	44.29	153.49	3.39	14.03	2.20	14.03	1.65	19.88	30.31	0.62	0.22	7.49	0.38	186.21
S23.3	33.05	113.20	3.32	12.02	2.49	12.02	1.56	23.06	34.30	1.00	0.26	10.07	0.50	190.00
S25.1	11.51	25.08	2.01	16.89	0.99	16.89	1.49	32.94	39.91	1.32	0.72	12.06	0.57	241.87
S25.2	9.37	44.19	4.26	4.77	0.95	4.77	1.44	43.31	20.99	0.49	0.24	4.30	0.33	135.03
S25.3	22.10	111.14	4.81	13.41	1.82	13.41	1.58	26.63	25.46	0.51	0.27	7.56	0.45	178.58
S1.1	4.22	9.93	1.90	0.58	0.78	0.58	1.60	29.01	2.63	0.15	0.20	3.35	0.23	131.04
S1.2	2.49	5.21	1.49	0.35	0.71	0.59	1.59	37.68	0.40	0.13	0.19	2.70	0.25	128.57
S7.1	2.36	5.34	1.59	0.29	0.84	0.48	1.53	29.74	0.69	0.09	0.18	2.19	0.30	79.37
S7.2	2.62	3.73	1.03	0.30	0.77	0.49	1.57	67.15	0.33	0.10	0.20	4.30	0.23	84.90
S23.1	2.35	3.44	1.03	0.58	0.51	0.76	1.52	36.90	3.47	0.12	0.30	4.17	0.25	101.02
S23.2	2.55	7.44	2.10	0.78	0.54	0.90	1.56	64.43	1.10	0.13	0.95	4.79	0.30	113.82

Appendix 4a

Site location and contour map: Tweerivier



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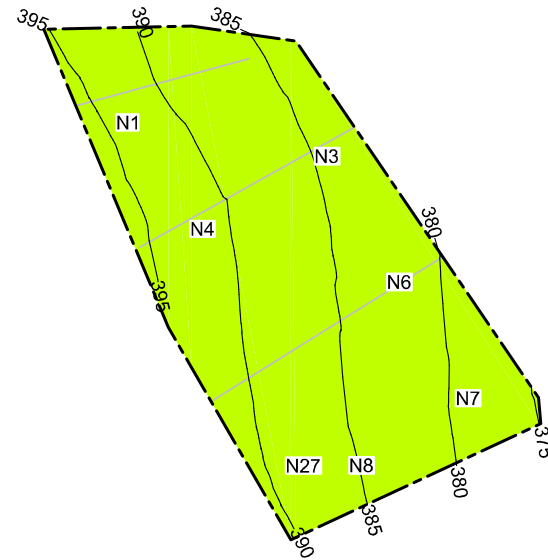
PROJECT

**DEPARTMENT AGRICULTURE:
TWEERIVIER SOIL ANALYSIS**

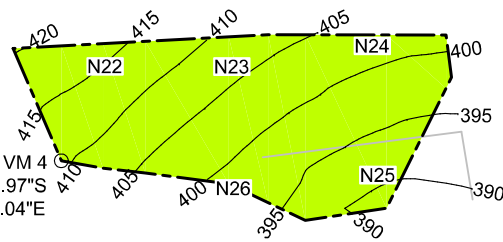
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PLAN NUMBER	REVISION NO.	DATE SAVED	
U31630C/100/03	A	04 Dec 2014	

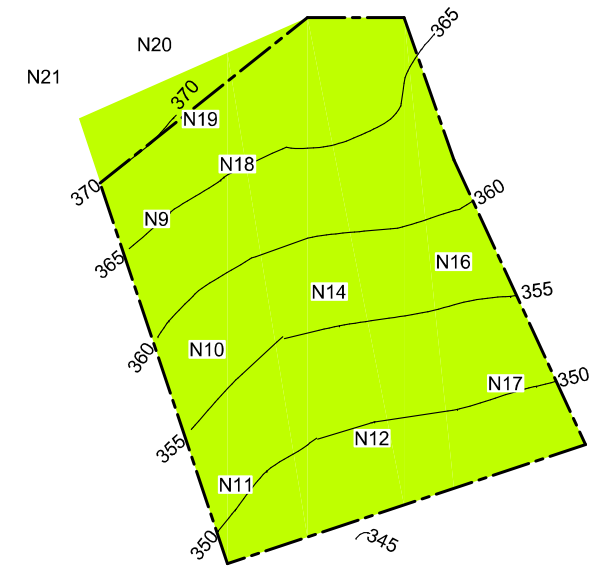


BENCH MARK VM 5
 Lat: 31°53'33.19"S
 Long: 19°08'04.53"E



BENCH MARK VM 4
 Lat: 31°53'41.97"S
 Long: 19°07'37.04"E

BENCH MARK TRST1
 Lat: 31°53'44.37"S
 Long: 19°07'57.02"E

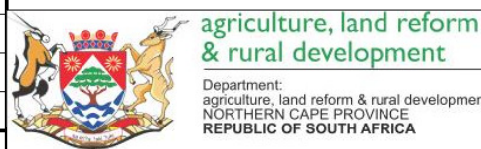


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DEPARTMENT AGRICULTURE:
 TWEERIVIER SOIL ANALYSIS

DRAWING TITLE

SITE LAYOUT
 & CONTOUR MAP

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PLAN NUMBER	REVISION NO.	DATE SAVED	
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Appendix 4b

Site location and contour map: Sonderwaterkraal



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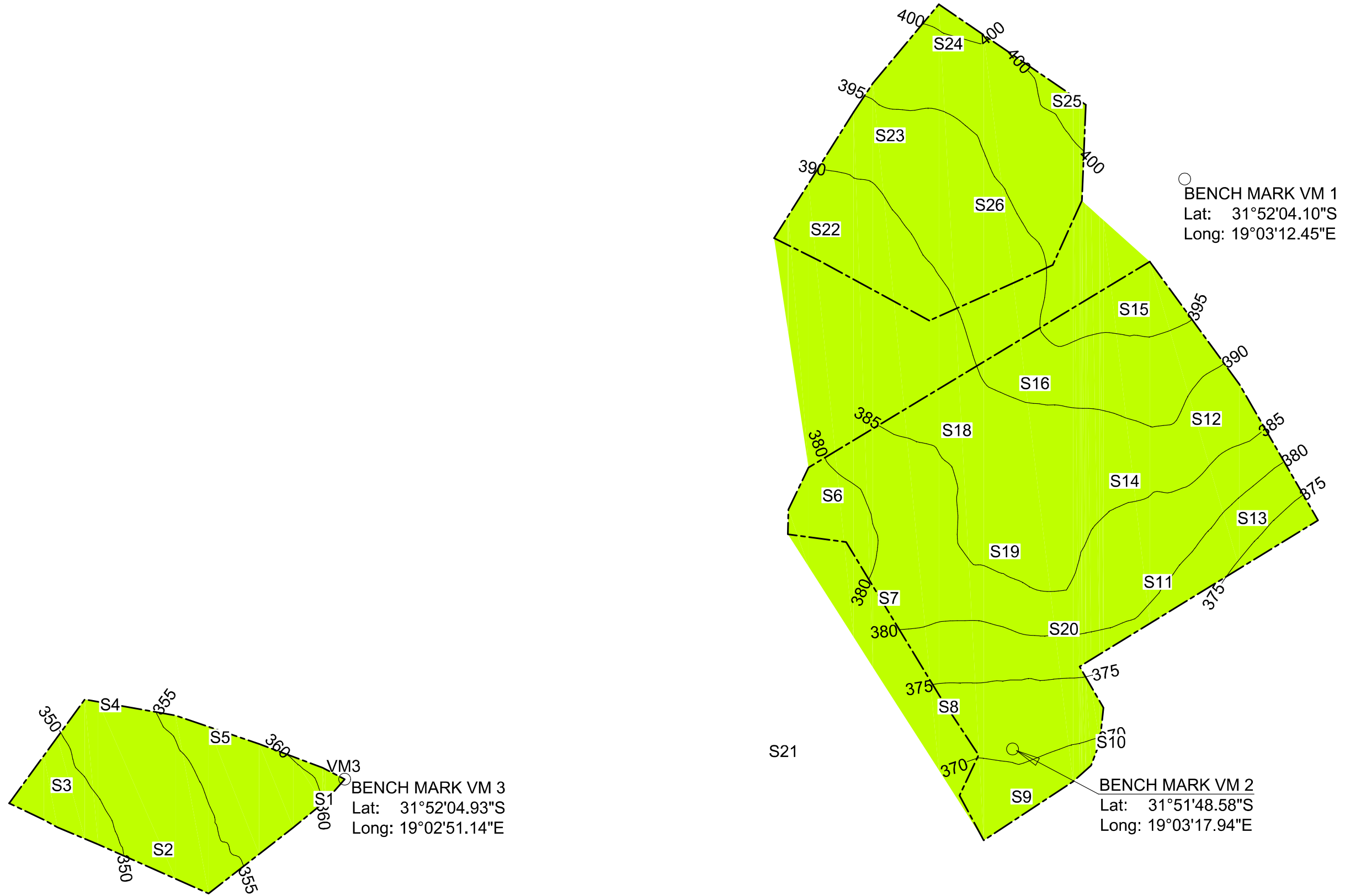
PROJECT

**DEPARTMENT AGRICULTURE:
SONDERWATERKRAAL
SOIL ANALYSIS**

DRAWING TITLE

LOCALITY PLAN

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Upington Office
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PROJECT

DEPARTMENT AGRICULTURE: SONDERWATERKRAAL SOIL ANALYSIS

DRAWING TITLE

SITE LAYOUT & CONTOUR MAP

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APPENDIX 6

PUBLIC PARTICIPATION

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

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APPENDIX 6

PUBLIC PARTICIPATION REPORT

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT
ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

THE CLIENT

Northern Cape - Department of Agriculture, Land Reform and Rural Development.

Prepared by:



MARCH 2017

Reg.: Cederberg Conservation Services CC – Reg. No 2009/056651/23

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

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PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

LIST OF ATTACHMENTS	
1	Notification to landowner
2	Application for Scoping / EIA submitted to DENC
3	Acknowledgement and Acceptance of the Application from DENC
4	Draft Scoping Report submitted to Case Officer
5	Proof of registered mail sent to key-stakeholders
6	Notification documents to Government Departments and neighbouring landowners
7	Advertisement – Ons Kontrei
8	Comments received
9	Wording of the site notification boards

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

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PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

1. Project description

The landowner, Mr Gerrie Koopman wishes to expand his organic rooibos tea (*Aspalathus linearis*) production capacity with an additional 21 hectares. Rooibos is an endemic plant to the Fynbos Biome that includes the most northerly section of the Biome – the Nieuwoudtville Plateau in the Northern Cape. The express aim is to address economies of scale and ensuring financial sustainability in a market that is characterized by significant volatility in price year on year. Mr. Koopman is part of the Rooibos emerging farmers development Ilima Letsema project.

The landowner seeks permission to develop 21 hectares for Rooibos tea production which will entail the clearance of natural vegetation for the preparation of the production areas. Two areas have been identified as suitable production areas after a comprehensive soil sample study undertaken by BVI Consulting Engineers in 2015. The establishment of the cultivation lands will entail the clearance of natural vegetation, firstly by brush cutting the vegetation and then ploughing it into the soil during the preparation phase. These areas will be cleared across the prevailing wind direction and >10m of natural vegetation strips will be retained between cultivated areas to serve as a refuge for beneficial insects and natural occurring plant species and more importantly to provide a wind break to prevent erosion, caused by wind. Cleared vegetation will be moved from the developed area and ploughed or distributed to the adjacent natural veld where it will decompose naturally. As the production will be based on organic.

The site is situated within the agricultural farm of Zonderwaterkraal Farm 951/0. The SG digit code for the cadastre is C0150000000095100000 and the site is located at GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E. Access to the site: Turn right on the R27 (road between Vanrhysdorp and Calvinia), towards the town of Nieuwoudtville, pass Nieuwoudtville and travel towards the Papkuilsfontein turn off, turn right and follow the dirt road towards Zonderwaterkraal. The farm can be reached after travelling 55 kilometres from Nieuwoudtville.

FOOTPRINT Environmental Services was appointed by the Northern Cape Department of Agriculture, Land Reform and Rural Development to manage the Scoping / EIA Process application process according to the NEMA guidelines in December 2014.

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

2. The process of public participation

The public participation process commenced immediately after sending the Draft Scoping Report to the Case Officer at the Northern Department of Environment and Nature Conservation.

DATE	TASK/PROCESS/ACTIVITY
5 July 2016	Notification to landowner (See Attachment 1)
13 January 2017	Application for Scoping / EIA Application submitted to DENC (See Attachment 2)
3 th February 2017	DENC acknowledge the Application and awarded the Case Number for the Scoping / EIA Process (See Attachment 3 – Acknowledgement from DENC).
8 February 2017	Draft Scoping Report sent to Case Officer (Attachment 4 – registered letter to Case Officer).
9 February 2017	Notification about the availability of the draft BAR and the timeframes to register and to provide comments, the background information document as well as a document to register as an Interested and Affected Party and to provide comments were sent out to 5 neighbouring properties, the landowner and 8 Government Institutions. See Attachment 5: Proof of registered mail sent out to key-stakeholders) and Attachment 6: Notification documents to Government Departments and neighbouring landowners (See Attachment 6– Notification to key stakeholders).
14 th February 2017	Public Participation started
17 th February 2017	Advertisement of the Draft SR published in "Ons Kontrei - (See Attachment 7 - Advert in Ons Kontrei).
16 th March 2017	Public Participation Process ended
23 March 2017	Scoping Report submitted to DENC

Table 1: Timeframes and public participation process.

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

3. Interested and Affected Parties

3.1 Database for Interested and Affected Parties

The client, Northern Cape Department of Agriculture, Land Reform and Rural Development and the landowner, provided FOOTPRINT Environment Services with a map indicating all the neighbouring properties, while the standard available key-stakeholders (government, conservation and heritage agencies, municipalities and the landowner) was also included in this database. The database was not viewed as static and was continually updated as people and organisations expressed interest in the project and registered as Interested and Affected Parties. Please note that the Heritage NID and all the relevant documents and archaeological reports were uploaded on the SAHRIS database. The database during the 1st round of public participation was the following:

Group	Organisation / Department	Title	Initials	Surname	Postal	Town	Code
Authorities	Hantam Municipality	The Municipal Manager			Private Bag X 14	Calvinia	8190
Authorities	Hantam Municipality	The ward councillor - Nieuwoudtville			Private Bag X 14	Calvinia	8190
Authorities	Namakwa District Municipality	The Municipal Manager			PO Box 20	Springbok	8240
Authorities	Department of Agriculture	Mr	L	October	PO Box 18	Springbok	8240
Authorities	Department of Water and sanitation	Mr	A	Abrahams	28 Central Road, Beaconsfield	Kimberley	8301
Authorities	National Department of Agriculture, Forestry and Fisheries. Land-use and Soil Management		Rahab	Maboa	Private Bag X2,	Sanlamhof	7532
Owner	Sonderwaterkraal	Mr	G	Koopman	PO Box 79	Nieuwoudtville	8180
Neighbour	Zonderwaterkraal	Mr	H	Koopman	P.O.Box 298	Nieuwoudtville	8180

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

Neighbour	Zonderwaterkraal and Landskloof	MS	D	Koopman	Po Box 47	Nieuwoudtville	8180
Neighbour	Mitarachope	Mr	P	Koopman	168 Cradock St	Graaf Reinet	6280
Neighbour	Tengiters Kloof	Mr	A	Afrika	PO Box 154	Nieuwoudtville	8180
NGO	Heiveld Co-operative Ltd	The CEO			PO Box 154	Nieuwoudtville	8180
NGO	Environmental Monitoring Group	Mr	N	Oettle	1 Nethling St	Nieuwoudtville	8180

Table 2: Database for Interested and Affected Parties at the initial phase of Public Participation.

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

3.2 Registered Interested and Affected Parties

The stakeholders could registered via fax or e-mail. However it must be noted that SAHRA did respond via the SAHRIS system and DAFF provide comments and inputs (**See Attachment 8 – Comments received**). No other Government Departments or any other potential Interested and Affected Parties respond to the opportunity to provide comments and inputs into the process as prescribe by Regulation 41 (2) of GN Nr 982 of the 4th December 2014.

REGISTERED INTERESTED AND AFFECTED PARTIES	REPRESENTATIVE	POSITION	ADDRESS
Municipalities			
No comments received			
Government Departments (2)			
SAHRIS	Natasha Higgitt	Heritage Officer	PO Box 4637
National Department of Agriculture, Forestry and Fisheries. Land-use and Soil Management	R. Maboja	Resource Auditor	Private Bag X2, Sanlamhof. 7532
Landowners and general public (0)			

Table 3: Registered Interested and Affected Parties

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

4. Background information documents, distribution list and notification records

4.1 Background information documents

These documents included:

- (a) An background information sheet, **(Attachment 6)**
- (b) An notification letter **(Attachment 6)** and
- (c) An application form to register as an Interested and Affected (I&AP) and to raise issues and comments **(Attachment 6)**.

All these documents contain information on the proposed Rooibos development, the location thereof, applicable listed activities and the process that will be followed with important dates and timeframes for certain activities (e.g. registration as I&AP).

4.2 Registered documents recipients

The above mentioned documentation was sent (on the 9th February 2017) via registered mail to the key stakeholders. **See Attachment 5 and 6.**

5. Photographs and site notification board

5.1 Signboard

A signboards (Size A2) was attached at the entrance to the property. The signboard will remained remain until the conclusion of the entire public participation process.



Figure 1: Site Notification Board at the two main entrance to the proposed development.

Please see Attachment 9 – Wording of the Notification Boards

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

6. Advertisements in local newspaper

The Draft Scoping Report BAR was advertised in “Ons Kontrei”, a local newspaper, both in English and Afrikaans. This advert was placed on the 17th February 2017. **See Attachment 7: Advert in “Ons Kontrei”.** The advertisements contain information on the commenting period (**14th February 2017 – 16th March 2017**), planned activities, listed activities, locality, applicant and the environmental practitioners contact details, it also describes the public participation process.

7. Initial comments and response from I&AP's (14th February 2017 – 16th March 2017).

This phase includes the initial registration of Interested and Affected Parties as well as the comments and issues raised by these stakeholders. **See Attachment 8: Comments received from SAHRA and DAFF.**

<p>SAHRA 6 March 2017 Natasha Higgitt</p>	<p><i>Interim Comment</i> - A signed letter from Dr Almond must be supplied regarding his assessment of palaeontological resources. Additionally, the project area must be mapped on the GIS layer of the SAHRIS Case application. Further comments will be issued upon receipt of the above.</p>	<p>As soon as we receive the signed letter from the palaeontological expert it will be loaded on the SAHRIS system. The .kml files for the proposed development were uploaded on SAHRIS. We await further comments from SAHRA.</p>
<p>National Department of Agriculture, Forestry and Fisheries. Land-use and Soil Management MR Maboia 10/03/2017</p>	<p>Since the development will involve the removal or disturbance of top soil according to CARA (Act 43 of 1983), cultivation in relation to land, means any act by means of which top soil is disturbed mechanically. Virgin land is defined as any land which is in the opinion of the executive officer has never been cultivated or mechanically disturbed in the past proceeding ten years. CARA supplication for clearing the proposed area for development is required prior as stated in the ACT.</p>	<p>Noted once the Environmental Authorization process is completed and Authorisation is granted a CARA application will be lodged.</p>
	<p>The proposed development may result in erosion, therefore the land user need to take care consideration of the following stipulation in regulation 4(1)&5(1) of CARA. Every land user shall by means of as many as the measures as are necessary in his situation, protect the cultivated land on his farm unit effectively against excessive soil loss as a result of erosion trough wind or water.</p>	<p>During the operation phase the landowner will minimize erosion by the following management practices;</p> <p><i>The following activities should be implemented to avoid impact soil;</i></p> <ul style="list-style-type: none"> • <i>Ensure that the natural strips remains intact and are not disturbed;</i> • <i>Ensure that no negative impacts occur on the remaining natural areas e.g. driving off roads, overgrazing, too frequent fires;</i> • <i>Regular monitoring of the site for signs of wind, sheet and gully erosion and implement mitigatory measure immediately;</i>

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

SCOPING REPORT

DENC Ref No. NC/BA/01/NAM/HAN/NIE1/2017

		<ul style="list-style-type: none">• <i>Maintain drainage and erosion control systems (run-offs, drainage channels, contours) on a monthly basis during the rainy season.</i> <p><i>This will be formalised in the EMPr.</i></p>
	Therefore, The Department has no objections on the proposed development and encourages the applicant to take responsibility that the above mentioned conditions are adhered to.	Noted.

Table 4 - Initial comments and response

8. Submission of the Scoping Report

The Scoping Report will be submitted to the Northern Department of Environment and Nature Conservation on the 23rd March 2017.

ATTACHMENT 1 - NOTIFICATION TO LANDOWNER

Sean Ranger

Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



www.footprintservices.co.za

Charl du Plessis

Cell: 079 172 4340
Fax: 086 608 8304
charlduplessis2@afrihost.co.za
PO Box 454
Porterville 6810

5 July 2016

NOTICE OF INTENT TO LANDOWNER

PO Box 79
Nieuwoudtville
8180

Dear Mr Gerrie Koopman

Proposed Rooibos Tea Production Area

Notice is hereby given of an Environmental Impact Assessment process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA). According to the NEMA Regulations dated December 2014 and the National Environmental Waste Act 2008 (Act 59 of 2008), an environmental impact assessment process must be undertaken when seeking an environmental authorisation from the competent authority before commencement of listed activities associated with the proposed development.

As the owner of Farm 951 restant Zonderwaterkraal this letter serves as a formal notice to inform you that Cedarberg Conservation Servcies CC, trading as FOOTPRINT Environmental Servcies (FES) have been appointed by the Department of Agriculture and Rural Development to undertake an Environmental Impact Assessment for the proposed Rooibos Tea development on the property.

Please be advised that a mandatory public participation process must be undertaken as part of the Environmental Impact Assessment process and that you have the right to participate in this process as a key stakeholder.

Yours Sincerely

KS Ranger

Notice to landowners

TAX INVOICE

Zonderwattelwail + Tweesiville

South African Post Office Limited
Porterville

05-JUL-2016 16:05:41
 Sessie : 710-79510-1-603790-1
 Tax No : 00538
 Teller Id: DONNY WILLIAMS
 TAX INVOICE VAT #4650101142
 ALL PRICES VAT INCLUSIVE
 VAT DOES NOT APPLY TO ITEMS MARKED *

Receipt For SA Post Office
Products Or Services

PRODUCT	QTY	UNIT PRICE	VAT	R AMOUNT
*R/SA LIGHT HOUSES/SH 5(N)	2 x	R25.00	14%	R50.00
VAT TOTAL @14%				R6.14
Sub Total				R50.00
VAT T... @14%				R6.14
Total				R50.00

We deliver, whatever it takes.

www.postoffice.co.za
 Customer Care Number 0860 111 502
 Crime Buster HotLine 0800 033 554

REGISTERED LETTER
GEREGISTREERDE BRIEF

(with an insurance option/met 'n versekeringsopsie)

Post Office

Full tracking and Facing/Volledige volg en spoor

Addressed to/Geadresseer aan
 Mr James Koppen
 P.O. Box 75
 Zonderwattelwail 8115
 Porterville

Postcode
 8115

The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance up to R2000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie brief is soos aangedui en 'n brief wat sonder voorbedingde ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekerings tot R2000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Insured value of contents
 Versekerde waarde van inhoud R

Enquiries/Navrae
 Toll-free number
 0800 111 502

REGISTERED LETTER
 (with a domestic insurance option)
 RC 126 202 419 Z.A

A BOOK COPY
 Plate Volg-en-Spoor-
 Klientaatskrif

Postage paid R
 Service fee/Diensgeld R
 Insurance/Versekering R
 Total/Totaal R

Initial of accepting office
 095 JUL 2016

PORTERVILLE
 6810
 Date stamp

Paraat va
 aanneem
 beampie

Datumstempel

701281

**ATTACHMENT 2 - APPLICATION FOR SCOPING / EIA
SUBMITTED TO DENC**

REGISTERED LETTER
GEREISTREERDE BRIEF
 (with an insurance option/met 'n versekeringsopsie)
 Post Office

Full tracking and tracing/Volledige volg en spoor

Addressed to/Geadresseer aan
 Messrs J. de la...
 P.O. Box 1234
 Pretoria 0001

Postcode 0001

Insured value of contents
 Versekerde waarde van inhoud R _____

Postage paid R 36.10

Service fee/Diensgeld R _____

Insurance/Verskering R _____

Total/Totaal R _____

REGISTERED LETTER
 (with a domestic insurance option)
 Sharecall 0860 111 502 www.sapo.co.za

RC 165 066 525 ZA
 CUSTOMER COPY 301028R
 Klientaalkopië

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Insured value of contents
 Versekerde waarde van inhoud R _____

Postage paid R 36.10

Service fee/Diensgeld R _____

Insurance/Verskering R _____

Total/Totaal R _____

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

Enquiries/Navrae
 Toll-free number
 0800 111 502

Initial of accepting officer

Date stamp
 2017-01-13

POSTAL AGENCY
 SUIDER PAARL
 701281

Paraat van aanvaer-beaemte

**ATTACHMENT 3 - ACKNOWLEDGEMENT AND
ACCEPTANCE OF THE APPLICATION FROM DENC**

Charl du Plessis

From: onwabile ndzumo <onyndzumo@gmail.com>
Sent: 03 Februarie 2017 10:57
To: Charl du Plessis
Subject: Re: FW: Application for Zonderwaterkraal

Morning

The Kimberly office has received the application on 26th January 2017.

The application has been assigned the reference number NC/BA/01/NAM/HAN/NIE1/2017.

On 1/23/17, Charl du Plessis <charlduplessis2@afrihost.co.za> wrote:

> Onwabile

>

> I hope this mail finds you well!

>

> Any progress on this.

>

> Regards

>

> Charl

>

>

>

> -----Original Message-----

> From: onwabile ndzumo [mailto:onyndzumo@gmail.com]

> Sent: 19 Januarie 2017 08:17

> To: glitimela <glitimela@ncpg.gov.za>; TMakaudi <tMAKAUDI@ncpg.gov.za>

> Cc: Sean Ranger <sean.ranger1@gmail.com>

> Subject: Re: FW: Application for Zonderwaterkraal

>

> Morning

>

> Kindly please assist on this enquiry.

>

> On 1/18/17, Charl du Plessis <charlduplessis2@afrihost.co.za> wrote:

>> Hi Onwabile

>>

>>

>>

>> Please find the proof of submission of the Zonderwaterkraal

>> application attached.

>>

>>

>>

>> Can you please provide us with a case number as soon as possible please.

>>
>>
>>
>> Regards and thank you for your assistance.
>>
>>
>>
>> Charl
>>
>>
>>
>> From: Sean Ranger [mailto:sean.ranger1@gmail.com]
>> Sent: 13 Januarie 2017 11:20
>> To: Charl du Plessis <charlduplessis2@afrihost.co.za>
>> Subject: Application for Zonderwaterkraal
>>
>>
>>
>> Hi Charl,
>>
>> Application for Zonderwaterkraal is on its way, attached the tracking
>> number FYR.
>>
>> S
>>
>>
>> Masters Inst Agrar - Ecological Sustainability Management - UP
>>
>> SACNASP Registered Ecological Scientist (No: 400215/16) Certified
>> EAP with EAPSA
>>
>> Member of IAIAAsa (No: 3694)
>>
>>
>>
>> <<https://docs.google.com/uc?id=0BxwHxh6A84scdXRXRkh2aV9zX00&export=do>
>> w
>> nload>
>>
>> www.footprintservices.co.za <<http://www.footprintservices.co.za>>
>> "The information contained in this message and its attachments may be
>> confidential or privileged and is for the use of the named
>> recipient(s) only. If you are not an intended recipient, you are not
>> to copy or deliver this message or attachments to anyone, and must
>> delete such messages and attachments from all of your databases
>> forthwith. Kindly also notify the sender immediately by email.
>> This file has been scanned for viruses. All reasonable efforts have
>> therefore been made to ensure that this message is virus free. The
>> sender therefore cannot accept liability for any damage, loss or
>> expense arising from malicious code in this email and/or from the
>> accessing of any files attached to this email."
>>

>>
>
>
> --
> Kind Regards
> Ms Onwabile Ndzumo : Environmental Officer Department of Environment
> and Nature Conservation.
> Directorate: Environmental Quality Management.
> Sub-Directorate: Impact Management.
> Physical Address: C/O Voortrekker & Magasyn Street, Springbok, 8240.
> Postal Address: Private Bag X16, Springbok, 8240.
> Tel: 027 718 8800
> Cell: 079 694 9760
> Fax: 027 718 8814
>
> "We did not inherit the earth from our fore fathers, we borrowed it
> from our children" D. Hall
>
>

--
Kind Regards
Ms Onwabile Ndzumo : Environmental Officer Department of Environment and Nature Conservation.
Directorate: Environmental Quality Management.
Sub-Directorate: Impact Management.
Physical Address: C/O Voortrekker & Magasyn Street, Springbok, 8240.
Postal Address: Private Bag X16, Springbok, 8240.
Tel: 027 718 8800
Cell: 079 694 9760
Fax: 027 718 8814

"We did not inherit the earth from our fore fathers, we borrowed it from our children" D. Hall

ATTACHMENT 4 - DRAFT SCOPING REPORT
SUBMITTED TO CASE OFFICER

Sean Ranger

Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



www.footprintservices.co.za

Charl du Plessis

Cell: 079 172 4340
Fax: 086 608 8304
charlduplessis2@afrihost.co.za
PO Box 454
Porterville 6810

7 February 2017

Department of Environment and Nature Conservation – Northern Cape
Private Bag X 6102
Kimberley
8300

Attention M Ms O Ndzumo

**PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT
ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE**

NC - Department of Environment and Nature Conservation Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Notice is given of a Public Participation Process in terms of the Environmental Assessment Regulation 41(2) van GN No. R.982 of 4 December 2014, promulgated under National Environmental Management Act (NEMA), Act 107 of 1998 as amended. **The Public Participation and commenting period** will start on the **14th February 2017** for the prescribed 30 days and will end on the **16th March 2017**. An electronic copy of the Draft Scoping Report is attached for your attention.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 15.

Please find the Draft Scoping Report attached.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 16.

Locality: The site is situated within the agricultural farm of Zonderwaterkraal Farm 951/0, the site is located at GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E. Turn right on the R27 (road between Vanrhysdorp and Calvinia), towards the town of Nieuwoudtville, pass Nieuwoudtville and travel towards the Papkuilsfontein turn off, turn right and follow the dirt road towards Zonderwaterkraal. The farm can be reached after travelling 55 kilometres from Nieuwoudtville.

Applicant: Department of Agriculture, Land Reform and Rural Development.

Environmental Assessment Practitioner: FOOTPRINT Environmental Services.

Regards

A handwritten signature in black ink, appearing to read 'K.S. Ranger'.

K.S Ranger

A handwritten signature in black ink, appearing to read 'C.P. du Plessis'.

C.P du Plessis

SENDER'S COPY

SPEED SERVICES COURIERS



TC211936402ZA

DOMESTIC CASH WAYBILL

0860 023 133
24 - HOUR CUSTOMER HELPLINE

Speed Services Couriers Head Office Reg No 19
21 Wrench Road, Isando, Private Bag 14-Johannesburg 1
Tel (+2711) 961-3400, Fax 0865 588 053
A division of the South African Post Office Ltd

7/06
mail 1627

FROM (SENDER)

COMPANY/NAME: FES

ADDRESS: P.O. Box 454
Porterville

POSTCODE: 6810

CONTACT: 01917 24340
C. de Plessis

PHONE/CELL NO.:

E-MAIL ADDRESS: charlde.plessis@afpost.co.za

TO (RECEIVER)

COMPANY/NAME: MR. ENDELMAN J Ntsho (Cape Town)

ADDRESS: PRIVATE BAG X 6102
Kimberley

POSTCODE: 8300

CONTACT: MRS L. O. Ndzumo

PHONE/CELL NO.:

E-MAIL ADDRESS:

FAX:

SENDER'S SIGNATURE

[Signature]

C. de Plessis

COUNTER to

*COUNTER Post Office Counter	DOOR 10h30 Front Door Delivery
<input checked="" type="checkbox"/>	<input type="checkbox"/>

SAMEDAY COURIER

SATURDAY SERVICE

AFTER HOURS

EARLY BIRD

PACKAGE DETAILS

TYPE OF GOODS: **DOCUMENTS**

NON DOCUMENTS

CONTENTS:

NAME (PRINT):

DATE: 08/02/17

LIABILITY / INSURANCE

YES NO

R

***ADVISE RECEIVER TO COLLECT FROM COUNTER**

DIMENSIONS (IN CM'S)	MASS
LENGTH	KG
WIDTH	GRAM
HEIGHT	

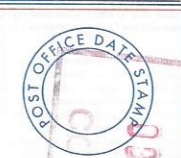
CHARGES FOR THIS SHIPMENT (INCL VAT)

R 3.00

RECEIVED BY SPEED SERVICES COURIERS

NAME: Printer TIME: DD MM YY

SIGNATURE: *[Signature]*



***ADVISE RECEIVER TO COLLECT FROM COUNTER**

POST OFFICE NAME: Kimberley

POSTAL CODE: 8300

NB: IMPORTANT INFO

This shipment is accepted subject to Speed Services Couriers Trading Conditions, and by tendering this shipment, the Sender acknowledges to have read from the back of this page, understood and accepted them. In the event of loss or damage, due to negligence on the part of Speed Services Couriers, liability is limited to a maximum of R50,00 or such amount as may be applicable, in terms of the Trading Conditions clause 8. If additional insurance is required, the value must be declared, in the space provided, and the relevant premium paid.

AMOUNT IN FINANCIAL STATEMENT
DEBITED AFTER FINANCIAL STATEMENT

The Shortest Distance Between Two Points.

CAT No. CON 060014

South African Post Office Limited
Porterville

06-FEB-2017	14:14:15		
Station Id:	710-7510-1-870276-1		
Unit No:	01940		
Unit Id:	F001304 015		
INVOICE NO:	#65010142		
ALL PRICES VAT INCLUSIVE			
VAT DEDS NOT APPLY TO ITEMS MARKED *			
Receive For SA Post office Products Or Services			
PRODUCT	QTY	UNIT PRICE	R AMOUNT
*S. PPD BND LBE	1	R73.00 142	R73.00
G/T TOTAL Q142			R8.96
G/T TOTAL			R73.00
G/T TOTAL Q142			R8.96
TOTAL			R73.00
DEBIT CARD			R73.00

06/02/17 14:14:12	TERM	3141497	1712 010
FRANS NO	116506	AUTH CODE	284141
PURCHASE	R73.00		
ACCEPTED			
We deliver, whatever it takes.			

www.postoffice.co.za
Customer Care Number 0860 111 502
Crime Buster Hotline 0800 003 554

**ATTACHMENT 5 - PROOF OF REGISTERED MAIL
SENT TO KEY-STAKEHOLDERS**

PROPOSED ESTABLISHMENT OF 21 HECTARES OF ROOIBOS CULTIVATION LANDS ON SONDERWATERKRAAL, FARM 95/10 NIEUWOUDEVILLE,

HANTAM LOCAL MUNICIPALITY, NAMAKWA DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

DENG REF NR NC/BA/01/NAM/HAN/NIE/1/2017

Group	Organisation / Department	Title	Initials	Surname	Postal	Town	Code	Registered letter
								Parcel
Authorities	Hantam Municipality	The Municipal Manager			Private bag X 14	Calvinia	8190	INTERNATIONAL INSURED PARCEL CV 005 319 476 ZA A BOOK COPY
Authorities	Hantam Municipality	The ward councillor - Nieuwoudtville			Private bag X 14	Calvinia	8190	INTERNATIONAL INSURED PARCEL CV 005 319 480 ZA A BOOK COPY
Authorities	Namakwa District Municipality	The Municipal Manager			PO Box 20	Springbok	8240	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 493 ZA CUSTOMER COPY
Authorities	Department of Agriculture	Mr L		October	PO Box 18	Springbok	8240	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 595 ZA CUSTOMER COPY
Authorities	Department of Water and sanitation	Mr A		Abrahams	28 Central Road, Beaconsfild	Kimberley	8301	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 604 ZA CUSTOMER COPY
Authorities	National Department of Agriculture, Forestry and Fisheries, Land-use and Soil Management		Rahab	Maboa	Private Bag X2,	Sanlamhof	7532	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 578 ZA CUSTOMER COPY
Owner	Sonderwaterkraal	Mr G		Koopman	PO Box 79	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 581 ZA CUSTOMER COPY
Neighbour	Zonderwaterkraal	Mr H		Koopman	P.O.Box 298	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 520 ZA CUSTOMER COPY
Neighbour	Zonderwaterkraal and Landskloof	MS D		Koopman	Po Box 47	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 502 ZA CUSTOMER COPY
Neighbour	Mitarchope	Mr P		Koopman	168 Cradock St	Graaf Reinet	6280	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 547 ZA CUSTOMER COPY
Neighbour	Tenglers Kloof	Mr A		Afrika	PO Box 154	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 533 ZA CUSTOMER COPY
NGO	Heiveld Co-operative Ltd	The CEO			PO Box 154	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 555 ZA A BOOK COPY
NGO	Environmental Monitoring Group	Mr N		Oettle	1 Nethling St	Nieuwoudtville	8180	INTERNATIONAL INSURED PARCEL ShareCall 0860 111 502 www.wspg.co.za CV 005 319 516 ZA CUSTOMER COPY

280

TAX INVOICE

South African Post Office Limited
Porterville

05-FEB-2017 08:54:49
 Session Id: 710-79510-1-871300-2
 Txn No: 01969
 Teller Id: FUNDISWA TUIS
 TAX INVOICE VAT #4650101142
 ALL PRICES VAT INCLUSIVE
 VAT DOES NOT APPLY TO ITEMS MARKED *

Receipt For SA Post Office
Products Or Services

PRODUCT	QTY	UNIT PRICE	VAT	R AMOUNT
Track and Trace (T&T #:CV005319516ZA)	1 x	R0.00		R0.00
Let. Let. Med. Reg. (Weight:0.043 kg) (Destination:South Africa)	7 x	R28.55	14%	R199.85
Track and Trace (T&T #:CV005319476ZA)	1 x	R0.00		R0.00
Track and Trace (T&T #:CV005319480ZA)	1 x	R0.00		R0.00
Track and Trace (T&T #:CV005319493ZA)	1 x	R0.00		R0.00
Track and Trace (T&T #:CV005319595ZA)	1 x	R0.00		R0.00
Track and Trace (T&T #:CV005319604ZA)	1 x	R0.00		R0.00
Track and Trace (T&T #:CV005319578ZA)	1 x	R0.00		R0.00
*R/SA LIGHT HOUSES/SH 5(M)	1 x	R25.00	14%	R25.00
*STAMP/REG LET MAIL RATE/6th	5 x	R25.00	14%	R125.00
VAT TOTAL @14%				R42.36
Sub Total				R349.85
VAT TOTAL @14%				R42.36
Total				R349.85

Debit Card R349.85
 EFIP0S
 *****1741 DEBIT 1712 CHQ
 05/02/17 09:19:40 TERM 3141497
 TRANS NO 116500 AUTH CODE 899193
 PURCHASE R349.85

REGISTERED LETTER
GEREGISTREERDE BRIEF
(with an insurance option / met 'n versekeringsopsie)

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Addressed to/Geadresseer aan
13 thirteen reg items
du Plessis

Postcode

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Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

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Tolvry nummer
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Initials of
 accounting
 officer

Date stamp
09 FEB 2017

701281

Paraat van
 aaneem-
 beaampste

Datumstempel

ATTACHMENT 6 - NOTIFICATION DOCUMENTS TO
GOVERNMENT DEPARTMENTS AND
NEIGHBOURING LANDOWNERS

Sean Ranger

Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



www.footprintservices.co.za

Charl du Plessis

Cell: 079 172 4340
Fax: 086 608 8304
charlduplessis2@afrihost.co.za
PO Box 454
Porterville 6810

7th February 2017

The Municipal Manager
Hantam Municipality
Calvinia, 8190

Attention Municipal Manager

**PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT
ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE**

NC - Department of Environment and Nature Conservation Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Notice is given of a Public Participation Process in terms of the Environmental Assessment Regulation 41(2) van GN No. R.982 of 4 December 2014, promulgated under National Environmental Management Act (NEMA), Act 107 of 1998 as amended. **The Public Participation and commenting period** will start on the **14th February 2017** for the prescribed 30 days and will end on the **16th March 2017**. An electronic copy of the Draft Scoping Report is attached for your attention.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 15.

Locality: The site is situated within the agricultural farm of Zonderwaterkraal Farm 951/0, the site is located at GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E. Turn right on the R27 (road between Vanrhysdorp and Calvinia), towards the town of Nieuwoudtville, pass Nieuwoudtville and travel towards the Papkuilsfontein turn off, turn right and follow the dirt road towards Zonderwaterkraal. The farm can be reached after travelling 55 kilometres from Nieuwoudtville.

Applicant: Department of Agriculture, Land Reform and Rural Development.

Environmental Assessment Practitioner: FOOTPRINT Environmental Services.

Regards

K.S Ranger

C.P du Plessis

Sean Ranger

Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



www.footprintservices.co.za

Charl du Plessis

Cell: 079 172 4340
Fax: 086 608 8304
charlduplessis2@afrihost.co.za
PO Box 454
Porterville 6810

7th February 2017

Dear Interested and Affected Party

**PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT
ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE**

NC - Department of Environment and Nature Conservation Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Notice is given of a Public Participation Process in terms of the Environmental Assessment Regulation 41(2) van GN No. R.982 of 4 December 2014, promulgated under National Environmental Management Act (NEMA), Act 107 of 1998 as amended. **The Public Participation and commenting period** will start on the **14th February 2017** for the prescribed 30 days and will end on the **16th March 2017**. An hard copy of the Draft Scoping Report is available at the Nieuwoudtville Hantam Municipal Offices for your attention.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 15.

Locality: The site is situated within the agricultural farm of Zonderwaterkraal Farm 951/0, the site is located at GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E. Turn right on the R27 (road between Vanrhysdorp and Calvinia), towards the town of Nieuwoudtville, pass Nieuwoudtville and travel towards the Papkuilsfontein turn off, turn right and follow the dirt road towards Zonderwaterkraal. The farm can be reached after travelling 55 kilometres from Nieuwoudtville.

Applicant: Department of Agriculture, Land Reform and Rural Development.

Environmental Assessment Practitioner: FOOTPRINT Environmental Services.

Regards

K.S Ranger

C.P du Plessis

**VOORGESTELDE VESTIGING VAN 21 HEKTAAR ROOIBOS TEE
LANDERYE OP SONDERWATERKRAAL, PLAAS 951/0 NIEUWOUDTVILLE**

**PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION
LANDS AT SONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE**

DEPT: O&NB VERW. NR: NC/BA/01/NAM/HAN/NIE1/2017

DENC Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Aansoeker : Departement van Landbou, Grondhervorming en Landelike Ontwikkeling.

Applicant: Department of Agriculture, Land reform and Rural Development

Konsultante: FOOTPRINT Environmental Services.

Consultants: FOOTPRINT Environmental Services

Kennis vir publieke deelname proses word gegee in terme van die Wet op Nasionale Omgewingsbestuur (WNOB) (Wet nr. 107 van 1998) (soos gewysig) en bepaal in Regulasie 41(2) van Goewerment Kennisgewing Nr. R.982 van 4 Desember 2014.

Notice is given of a Public Participation Process in terms of the Environmental Assessment Regulation 41(2) van GN No. R.982 of 4 December 2014, promulgated under National Environmental Management Act (NEMA), Act 107 of 1998 as amended.

Projek ligging: Die voorgestelde vestiging van nuwe Rooibostee lande word beplan vir Sonderwaterkraal, Plaas 951/0, Nieuwoudville (GPS 31° 51' 35.48" S & 19° 03' 50.78" E.).

Project location: The site is situated within the agricultural farm of Sonderwaterkraal Farm 951/0 (GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E).

Projek beskrywing: Die aansoeker versoek magtiging om 21 hektaar natuurlike plantegroei te verwyder en te ontwikkel as landerye waarop rooibostee verbou kan word. Die areas sal teen die bestaande windrigting gevestig word om wind erosie te verminder. Stroke van 10m natuurlike plantegroei gaan ook gelaat word ten einde die beweging van natuurlike biota te verseker. 'n Grondanalise studie is reeds onderneem wat die geskiktheid van die area bevestig. Die ontwikkeling pook om finansiële volhoubaarheid van die eienaar te verseker in 'n bedryf wat gekenmerk word deur jaarlikse mark fluktuasies. Die Nieuwoudville Plato is een van die vernaamste Rooibos produserende areas in die streek.

Project description: The applicant wishes to clear 21hectares indigenous vegetation to establish Rooibos Tea. The cultivated areas will be against the prevailing wind direction in order to mitigate the impact of wind erosion. Strips of natural vegetation of at least 10m will be left in order to allow for the movement of natural biota. A soil analyses report has been completed for the sites and indicated that the soil is suitability for Rooibos production. This application will ensure financial sustainability of the landowner in a market that is characterized by significant volatility in price year on year. The Nieuwoudville Plateau is recognized as one of the best Rooibos tea production areas within the natural distribution area of Rooibos.

Gelyste aktiwiteite: Die beplande ontwikkeling van die rooibostee lande op Sonderwaterkraal is onderworpe aan 'n Bestekopname en Omgewingsimpak Proses. Aansoek word gedoen vir Gelyste Notering 2 van Goewerment Kennisgewing (GK No R. 984) en spesifiek Aktiwiteit 15.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 15.

Registrasie van Geïnteresseerde en Geaffekteerde Partye (GGP) – 'n Konsep Bestekopname verslag sal beskikbaar wees by die Hantam Munisipaliteit kantoor op Nieuwoudville vanaf 13 Februarie 2017. Alle Geïnteresseerde en Geaffekteerde Partye word vriendelik versoek om kommentaar te lewer oor die voorgestelde ontwikkeling of om kwessies te identifiseer wat u in die verslag wil laat aanspreek. Dui ook asseblief aan van enige direkte sake-, finansiële, persoonlike of ander belang wat u in die aansoek mag hê.

Registration as Interested and Affected Parties (I&AP): The Draft Scoping Report will be available at the Hantam Municipal Offices at Nieuwoudville from the 13th February 2017. Interested and Affected Parties (I&AP) are hereby requested to provide comments and inputs regarding the proposed development. Please indicate any interest you may have in the project either direct business, financial and personal or any other interest in the proposed development.

Verwys na - DEPT: O&NB Verw. Nr NC/BA/01/NAM/HAN/NIE1/2017

Always refer to - DENC Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Periode vir kommentaar: 14 Februarie 2017 tot 16 Maart 2017.

Commenting timeframe: 14 February 2017 – 16th March 2017.

Sean Ranger

Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



www.footprintservices.co.za

Charl du Plessis

Cell: 079 172 4340
Fax: 086 608 8304
charlduplessis2@afrihost.co.za
PO Box 454
Porterville 6810

NOTIFICATION
PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT SONDERWATERKRAAL, FARM
951/0, NIEUWOUDTVILLE

DENC Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

KENNISGEWING
VOORGESTELDE VESTIGING VAN 21 HEKTAAR ROOIBOS TEE LANDERYE OP SONDERWATERKRAAL, PLAAS 951/0
NIEUWOUDTVILLE

DEPT: O&NB VERWYSING NR: NC/BA/01/NAM/HAN/NIE1/2017

Indien u enige kommentaar het en wil registreer as 'n Geïnteresseerde en Geaffekteerde Party, voltooi asseblief die vorm en stuur terug aan **FOOTPRINT Environmental Services voor of op 16 Maart 2017.**

Should you have any comments and/or would like to register as ad Interested and Affected Party ("I&AP"), please complete this Form and return to **FOOTPRINT Environmental Services by the 16th March 2017.**

Kontakbesonderhede / Contact details:

Posbus / PO Box 454, Porterville, 6810; 086 6088304 (faks / fax); e-pos / e-mail charlduplessis2@afrihost.co.za

Titel en Naam (Title and Name)	
Adres (Address)	
Tel en Faks (Tel and Fax)	
Sel (Cell)	
E-pos (E-Mail)	

U KOMMENTAAR / YOUR COMMENTS

1. Die volgende kwessies moet aangespreek word in die verslag / The following issues should be addressed in the report.

2. Die volgende kommentaar word gelewer / The following comments are made.

3. Enige persoonlike, besigheid, finansiële of ander belange by die aansoek / Any personal, business, financial or other interests regarding this application.

DANKIE VIR U DEELNAME / THANK YOU FOR YOUR PARTICIPATION

ATTACHMENT 7 – ADVERTISEMENT ONS KONTREI

VOORGESTELDE VESTIGING VAN 21 HEKTAAR ROOIBOS TEE LANDERYE OP SONDERWATERKRAAL, PLAAS 951/0 NIEUWOUDTVILLE

DEPT: O&NB VERW. NR:
NC/BA/01/NAM/HAN/NIE1/2017

PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION LANDS AT ZONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE

DENC Ref Nr.
NC/BA/01/NAM/HAN/NIE1/2017

Aansoeker : Departement van Landbou, Grondher-
vorming en Landelike Ontwikkeling.

Konsultante: FOOTPRINT Environmental Services.
Kennis vir publieke deelname proses word gegee in
terme van die Wet op Nasionale Omgewingsbestuur
(WNOB) (Wet nr. 107 van 1998) (soos gewysig) en
bepaal in Regulasie 41(2) van Goewerment
Kennisgewing Nr. R.982 van 4 Desember 2014

Projek ligging: Die voorgestelde vestiging van nuwe
Rooibos lande word beplan vir Sonderwaterkraal,
Plaas 951/0, Nieuwoudtvilte (GPS 31° 51' 35.48" S &
19° 03' 50.78" E.).

Projek beskrywing: Die aansoeker versoek
magtiging om 21 hektaar natuurlike plantegroei te
verwyder en te ontwikkel as landerye waarop
rooibos teë verbou kan word. Die areas sal teen die
bestaande windrigting gevestig word om wind erosie te
verminder. Stroke van 10m natuurlike plantegroei
gaan ook gelaat word ten einde die beweging van
natuurlike biota te verseker. 'n Grondanalise studie is
reeds onderneem wat die geskiktheid van die area
bevestig. Die ontwikkeling poog om finansiële
volhoubaarheid van die eienaar te verseker in 'n bedryf
wat gekenmerk word deur jaarlikse mark fluktuasies.
Die Nieuwoudtvilte Plato is een van die vernaamste
Rooibos produserende areas in die streek.

Gelyste aktiwiteite: Die beplande ontwikkeling van
die rooibos teë lande op Sonderwaterkraal is
onderworpe aan 'n Bestekopname en Omgewing-
simpak Proses. Aansoek word gedoen vir Gelyste
Notering 2 van Goewerment Kennisgewing (GK No R.
984) en spesifiek Aktiwiteit 15.

**Registrasie van Geïnteresseerde en Geaffekteerde
Partye (GGP)** 'n Konsep Bestekopname verslag sal
beskikbaar wees by die Hantam Munisipaliteit kantoor
op Nieuwoudtvilte vanaf 13 Februarie 2017. Alle
Geïnteresseerde en Geaffekteerde Partye word
vriendelik versoek om kommentaar te lewer oor die
voorgestelde ontwikkeling of om kwessies te
identifiseer wat u in die verslag wil laat aanspreek. Dui
ook asseblief aan van enige direkte sake-, finansiële,
persoonlike of ander belang wat u in die aansoek mag
hê.

Verwys na - DEPT: O&NB Verw. Nr
NC/BA/01/NAM/HAN/NIE1/2017

Periode vir kommentaar:
14 Februarie 2017 tot 16 Maart 2017

Applicant: Department of Agriculture, Land reform
and Rural Developmen.

Consultants: FOOTPRINT Environmental Services
Notice is given of a Public Participation Process in
terms of the Environmental Assessment Regulation
41(2) van GN No. R.982 of 4 Desember 2014,
promulgated under National Environmental Manage-
ment Act (NEMA), Act 107 of 1998 as amended.

Project location: The site is situated within the
agricultural farm of Zonderwaterkraal Farm 951/0 (GPS
coordinates 31° 51' 35.48" S & 19° 03' 50.78" E).

Project description: The applicant wishes to clear
21 hectares indigenous vegetation to establish Rooibos
Tea. The cultivated areas will be against the prevailing
wind direction in order to mitigate the impact of wind
erosion. Strips of natural vegetation of at least 10m will
be left in order to allow for the movement of natural
biota. A soil analyses report has been completed for the
sites and indicated that the soil is suitability for Rooibos
production. This application will ensure financial
sustainability of the landowner in a market that is
characterized by significant volatility in price year on
year. The Nieuwoudtvilte Plateau is recognized as one
of the best Rooibos tea production areas within the
natural distribution area of Rooibos.

Listed Activities: The proposed agricultural develop-
ment will trigger listed activities in terms of the NEMA
EIA Regulations, 2014. In particular Listing Notice 2
(GN No. R. 984 of 4th December 2014) specifically
Activity 15.

**Registration as Interested and Affected Parties
(I&AP)**: The Draft Basic Assessment Report will be
available at the Hantam Municipal Offices at
Nieuwoudtvilte from the 13 February 2017. Interested
and Affected Parties (I&AP) are hereby requested to
provide comments and inputs regarding the proposed
development. Please indicate any interest you may
have in the project either direct business, financial and
personal or any other interest in the proposed
development.

Always refer to - DENC Ref Nr.
NC/BA/01/NAM/HAN/NIE1/2017

Commenting timeframe:
14th February 2017 16th March 2017

Sean Ranger
Cell: 083 294 8776
Fax: 086 655 8060
sean.ranger1@gmail.com
3 Laborie St, Courtrai
South Paarl 7646



Biodiversity and Environmental
Management Consultancy

Charl du Plessis
Cell: 079 172 4340
Fax: 086 608 8304
charludplessis2@afrihost.co.za
PO Box 454
Porterville 6810

ATTACHMENT 8 - COMMENTS RECEIVED



agriculture, forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Directorate: Land Use and Soil Management

Private Bag x 2, Sanlamhof, 7532,
17 Strand Street, Bellville, 7530

☐ **Tel:** 021 944 1422/24 ☐ **Fax:** 021 944 1427 ☐ **E-mail:** RahabM@daff.gov.za

☐ **Enquiries:** Maboja M.R ☐ **Date:** 10/03/2017

Footprint Environmental Services

P O Box 454

Potterville

6810

Attention: Charl du Plessis

COMMENTS ON DRAFT SCOPING REPORT FOR ENVIRONMENTAL IMPACT ASSESSMENT PROCESS ON ESTABLISHMENT OF 21HA ROOIBOS LANDS AT ZONDERWATERKRAAL FARM NO 951/10 IN NIEWOUDTVILLE, NAMAKWA DISTRICT (HANTAM MUNICIPALITY) IN NOTHERN CAPE; REF: NC/BA/01NAM/HAN/NIE1/2017 IN NOTHERN CAPE

The Department of Agriculture, Fisheries & Forestry Directorate: Land Use and Soil Management administer and implement the Conservation of Agricultural Resources Act, (CARA) 43 of 1983). The Act is regarded as one of the principal Acts governing the protection of agricultural natural resources. The main objective of the Act is to control the utilization of natural agricultural resources to ensure the conservation of soil, water and vegetation, as well as the combating of alien and invasive plants. According to Section 1 of the Act, conservation of natural agricultural resources includes the protection, recovery as well as the reclamation thereof.

Since the development will involve the removal or disturbance of top soil according to Conservation of Agricultural Resources Act, 1983, (Act 43 of 1983), cultivation in

relation to land, means any act by means of which top soil is disturbed mechanically. Virgin land is defined as any land which in the opinion of the executive officer has never been cultivated or mechanically disturbed in the past proceeding ten years. CARA application for clearing the proposed area for development is required prior as stated in the act (regulation 2 of Act 43 of 1983).

The proposed development may result in erosion, therefore the land user need to take consideration of the following as stipulated in regulation 4 (1) & 5 (1) of CARA act 43 of 1983 every land user shall by means of as many as the measures as are necessary in his situation, protect the cultivated land on his farm unit effectively against excessive soil loss as a result of erosion through the action of either wind or water. A suitable soil conservation work shall be constructed and thereafter be maintained in order to divert run-off water from other land or to restrict the run-of speed of run-off water if applicable, regulation 4(1)(a). According regulation 5 (1) (a) the land concerned shall be cultivated in accordance with such method or be laid out in such manner that the surface movement of soil particles through action of wind is restricted.

Therefore, this Department has no objections on the proposed development and encourages the applicant to take responsibility that the above mentioned conditions are adhered to. However, the Department reserves the right to revise its initial comments and request further information from you based on any new or revised information received.



pp. EXECUTIVE OFFICER: Act No 43 OF 1983

Director: Land Use and Soil Management

Our Ref:



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 10150

Date: Monday March 06, 2017
Page No: 1

Interim Comment

In terms of Section 38(2) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Department of Agriculture, Land Reform and Rural Development

The landowner wishes to develop 21 hectares Rooibos cultivation lands at Sonderwaterkraal, Farm 951/0, Nieuwoudtville in the Hantam Municipality in the Northern Cape.

Footprint Environmental Services was appointed by the Department of Agriculture, Rural Development and Land Reform: Northern Cape to conduct an Environmental Impact Assessment (EIA) Process for the proposed establishment of 21 hectares of Rooibos Cultivation Lands on Zonderwaterkraal, Farm 951/0, Nieuwoudtville, Northern Cape Province. A Draft Scoping Report has been submitted in term of the National Environmental Management Act, 1998 (NEMA) and the NEMA EIA Regulations 2014. The proposed development will comprise 21 ha of rooibos fields. ACRM was appointed to conduct the Heritage Impact Assessment for the proposed project.

Kaplan, J. 2016. Heritage Impact Assessment: Proposed cultivation of Rooibos Tea, Farm 951 Zonderwaterkraal, near Nieuwoudtville, Hantam Municipality, Northern Cape.

According to consultation with Dr J Almond, the proposed development is underlain by fluvial sandstones of the Rietvlei Formation that are of low palaeontological sensitivity.

One broken Later Stone Age silcrete flake of low significance was identified within the proposed new fields. No further heritage resources were identified. Recommendations provided in the report include the following:

- No archaeological mitigation is required;
- If any other unmarked human remains, or ostrich eggshell caches, for example are exposed or uncovered during excavation, these must be immediately be report to Natasha Higgitt (021 462 4509) or the contracted archaeologist (Jonathan Kaplan 082 321 0172);
- The above recommendation must be incorporated into the Environmental Management Plan (EMP) for the proposed development.

Interim Comment

A signed letter from Dr Almond must be supplied regarding his assessment of palaeontological resources. Additionally, the project area must be mapped on the GIS layer of the SAHRIS Case application. Further comments will be issued upon receipt of the above.

Our Ref:



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 10150

Date: Monday March 06, 2017
Page No: 2

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

John Gribble
Manager: Maritime and Underwater Cultural Heritage Unit / Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/369789>
(DENC, Ref: NC/BA/01/NAM/HAN/NIE1/2017)

ATTACHMENT 9 - WORDING OF THE SITE
NOTIFICATION BOARDS

**VOORGESTELDE VESTIGING VAN 21 HEKTAAR ROOIBOS TEE
LANDERYE OP SONDERWATERKRAAL, PLAAS 951/0 NIEUWOUDTVILLE**

**PROPOSED ESTABLISHMENT OF 21 HECTARES, ROOIBOS CULTIVATION
LANDS AT SONDERWATERKRAAL, FARM 951/0, NIEUWOUDTVILLE**

DEPT: O&NB VERW. NR: NC/BA/01/NAM/HAN/NIE1/2017

DENC Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Aansoeker : Departement van Landbou, Grondhervorming en Landelike Ontwikkeling.

Applicant: Department of Agriculture, Land reform and Rural Development

Konsultante: FOOTPRINT Environmental Services.

Consultants: FOOTPRINT Environmental Services

Kennis vir publieke deelname proses word gegee in terme van die Wet op Nasionale Omgewingsbestuur (WNOB) (Wet nr. 107 van 1998) (soos gewysig) en bepaal in Regulasie 41(2) van Goewerment Kennisgewing Nr. R.982 van 4 Desember 2014.

Notice is given of a Public Participation Process in terms of the Environmental Assessment Regulation 41(2) van GN No. R.982 of 4 December 2014, promulgated under National Environmental Management Act (NEMA), Act 107 of 1998 as amended.

Projek ligging: Die voorgestelde vestiging van nuwe Rooibostee lande word beplan vir Sonderwaterkraal, Plaas 951/0, Nieuwoudville (GPS 31° 51' 35.48" S & 19° 03' 50.78" E.).

Project location: The site is situated within the agricultural farm of Sonderwaterkraal Farm 951/0 (GPS coordinates 31° 51' 35.48" S & 19° 03' 50.78" E).

Projek beskrywing: Die aansoeker versoek magtiging om 21 hektaar natuurlike plantegroei te verwyder en te ontwikkel as landerye waarop rooibostee verbou kan word. Die areas sal teen die bestaande windrigting gevestig word om wind erosie te verminder. Stroke van 10m natuurlike plantegroei gaan ook gelaat word ten einde die beweging van natuurlike biota te verseker. 'n Grondanalise studie is reeds onderneem wat die geskiktheid van die area bevestig. Die ontwikkeling pook om finansiële volhoubaarheid van die eienaar te verseker in 'n bedryf wat gekenmerk word deur jaarlikse mark fluktuasies. Die Nieuwoudville Plato is een van die vernaamste Rooibos produserende areas in die streek.

Project description: The applicant wishes to clear 21hectares indigenous vegetation to establish Rooibos Tea. The cultivated areas will be against the prevailing wind direction in order to mitigate the impact of wind erosion. Strips of natural vegetation of at least 10m will be left in order to allow for the movement of natural biota. A soil analyses report has been completed for the sites and indicated that the soil is suitability for Rooibos production. This application will ensure financial sustainability of the landowner in a market that is characterized by significant volatility in price year on year. The Nieuwoudville Plateau is recognized as one of the best Rooibos tea production areas within the natural distribution area of Rooibos.

Gelyste aktiwiteite: Die beplande ontwikkeling van die rooibostee lande op Sonderwaterkraal is onderworpe aan 'n Bestekopname en Omgewingsimpak Proses. Aansoek word gedoen vir Gelyste Notering 2 van Goewerment Kennisgewing (GK No R. 984) en spesifiek Aktiwiteit 15.

Listed Activities: The proposed agricultural development will trigger listed activities in terms of the NEMA EIA Regulations, 2014. In particular Listing Notice 2 (GN No. R. 984 of 4th December 2014) specifically Activity 15.

Registrasie van Geïnteresseerde en Geaffekteerde Partye (GGP) – 'n Konsep Bestekopname verslag sal beskikbaar wees by die Hantam Munisipaliteit kantoor op Nieuwoudville vanaf 13 Februarie 2017. Alle Geïnteresseerde en Geaffekteerde Partye word vriendelik versoek om kommentaar te lewer oor die voorgestelde ontwikkeling of om kwessies te identifiseer wat u in die verslag wil laat aanspreek. Dui ook asseblief aan van enige direkte sake-, finansiële, persoonlike of ander belang wat u in die aansoek mag hê.

Registration as Interested and Affected Parties (I&AP): The Draft Scoping Report will be available at the Hantam Municipal Offices at Nieuwoudville from the 13th February 2017. Interested and Affected Parties (I&AP) are hereby requested to provide comments and inputs regarding the proposed development. Please indicate any interest you may have in the project either direct business, financial and personal or any other interest in the proposed development.

Verwys na - DEPT: O&NB Verw. Nr NC/BA/01/NAM/HAN/NIE1/2017

Always refer to - DENC Ref Nr. NC/BA/01/NAM/HAN/NIE1/2017

Periode vir kommentaar: 14 Februarie 2017 tot 16 Maart 2017.

Commenting timeframe: 14 February 2017 – 16th March 2017.

Sean Ranger

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APPENDIX 7

ECOLOGICAL & VEGETATION SENSITIVITY MAP

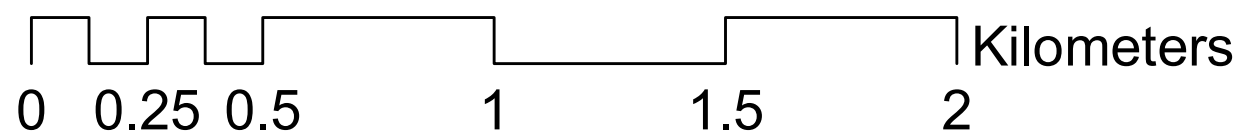
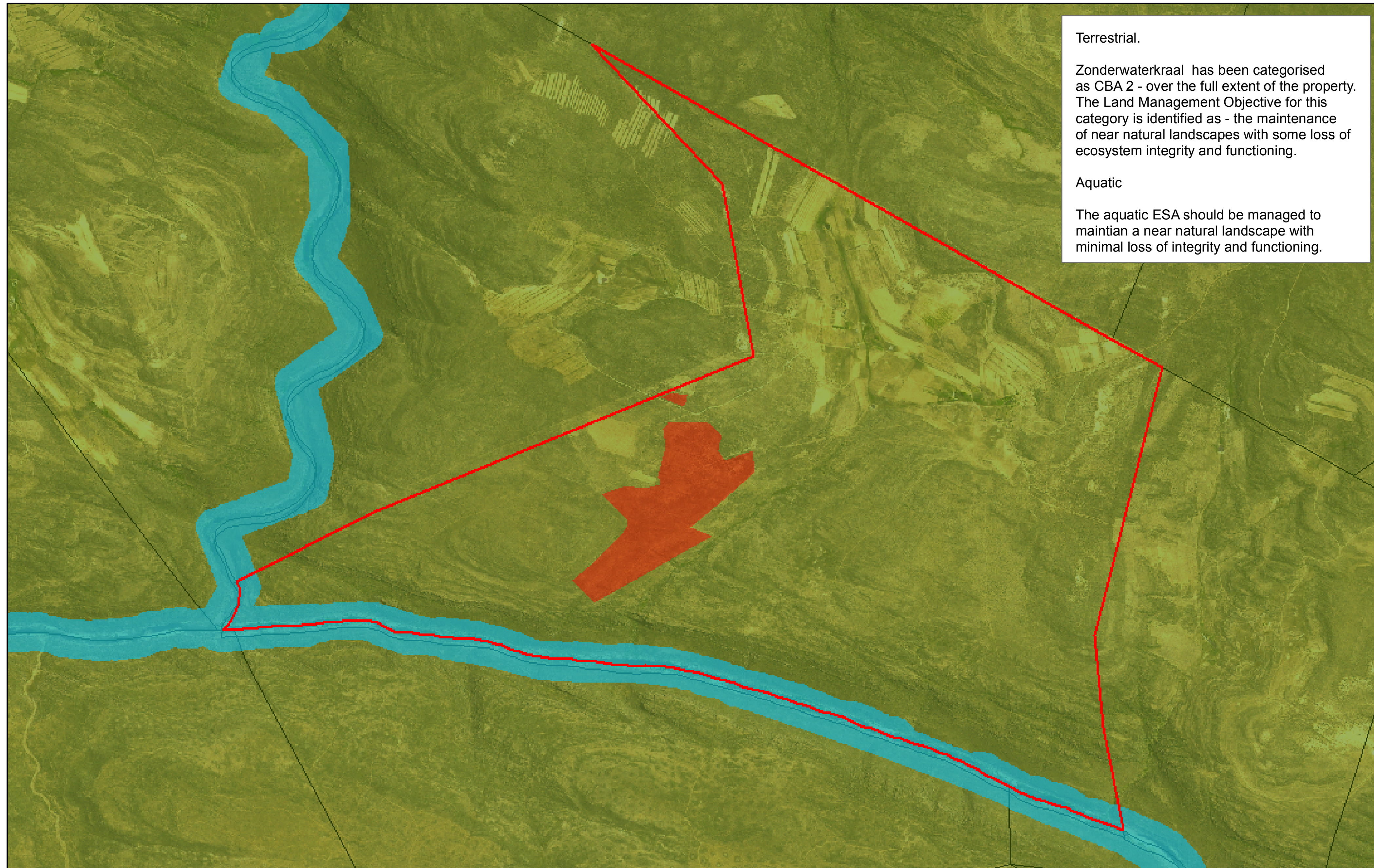
Zonderwaterkraal - Terrestrial & Aquatic Ecosystem Sensitivity Map

Terrestrial.

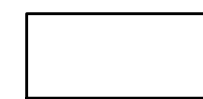
Zonderwaterkraal has been categorised as CBA 2 - over the full extent of the property. The Land Management Objective for this category is identified as - the maintenance of near natural landscapes with some loss of ecosystem integrity and functioning.

Aquatic

The aquatic ESA should be managed to maintain a near natural landscape with minimal loss of integrity and functioning.



Property Boundary



Cadastral Boundaries



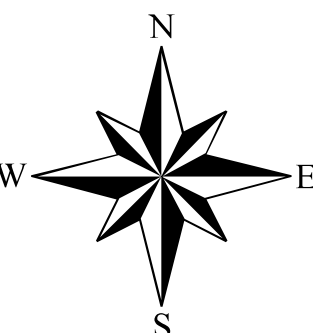
Ecological Support Area - Aquatic



CBA 2 - Terrestrial

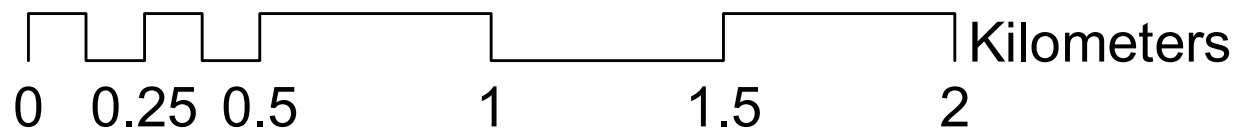
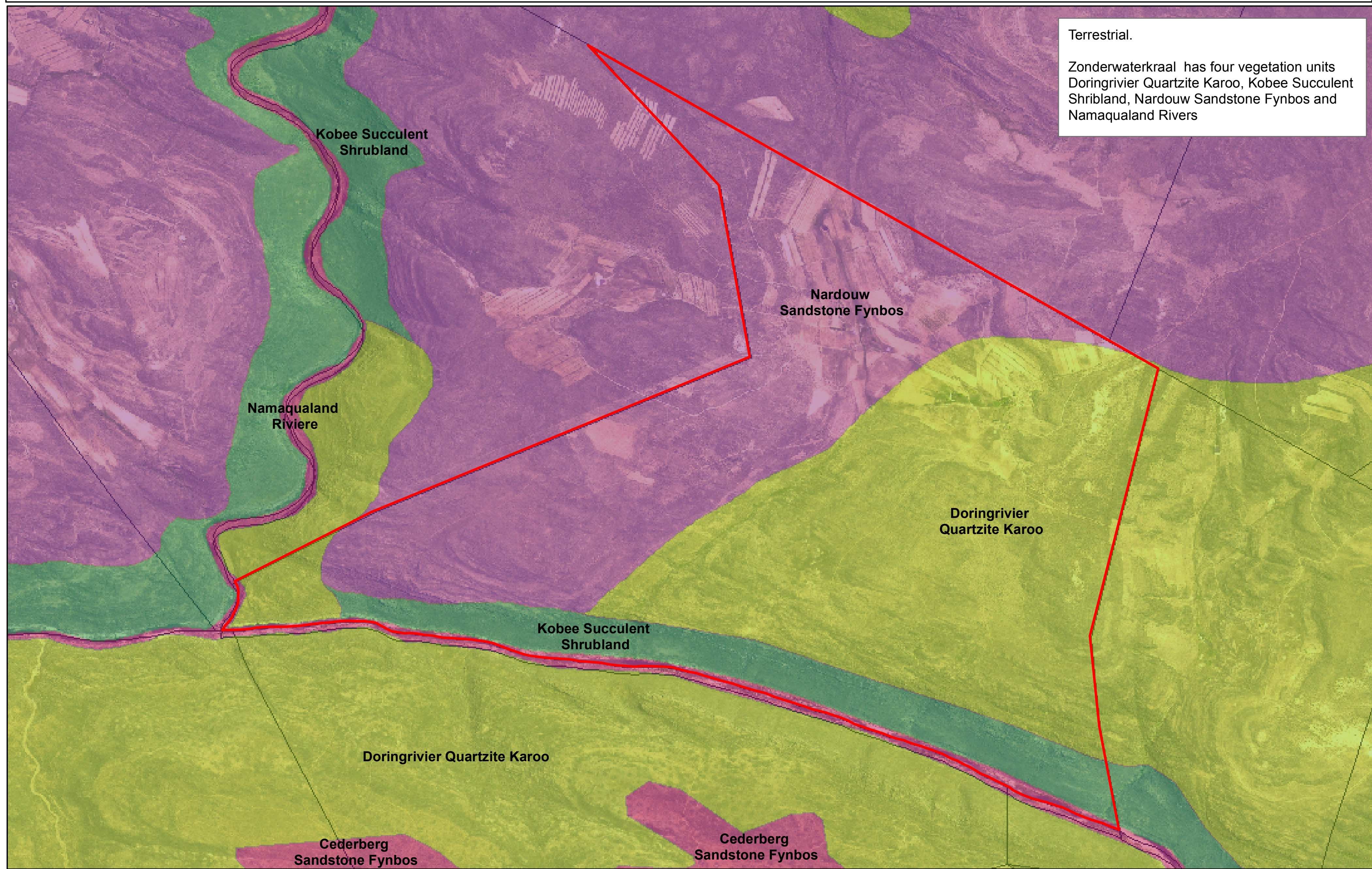




High Sensitivity Area - Botanical



Zonderwaterkraal - Terrestrial Vegetation Types

Terrestrial.
Zonderwaterkraal has four vegetation units
Doringrivier Quartzite Karoo, Kobee Succulent
Shrubland, Nardouw Sandstone Fynbos and
Namaqualand Rivers



-  Property Boundary
-  Cadastral Boundaries

