

BIODIVERSITY SURVEY: EXTENSION OF THE MELKHOUTFONTEIN CEMETERY, NEAR STILL BAY

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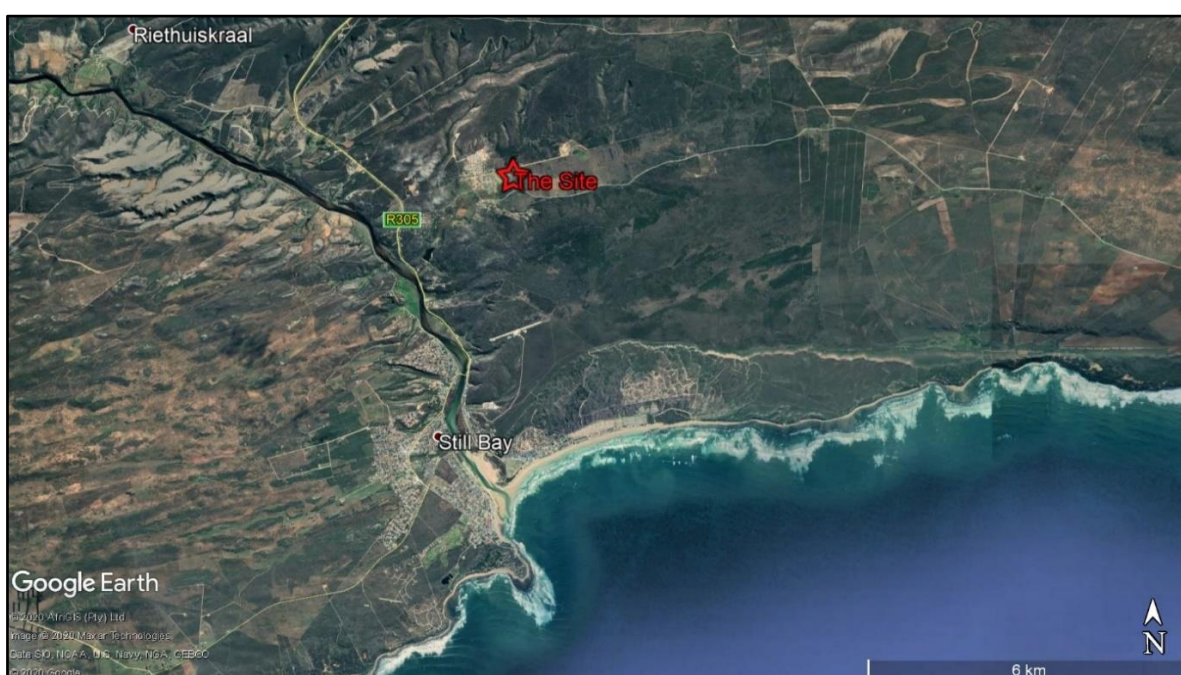
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1 INTRODUCTION

This report investigates the biodiversity aspects of a site (± 1.83 ha) on the western side of Melkhoutfontein earmarked for the extension of the local cemetery (see Map 1). The site is located on Erf 566 and Farm 480/14, Melkhoutfontein. The existing cemetery is located directly to the west of the site. The aim of the study, which was requested by Sharples Environmental Services (EAP), is to determine the biodiversity value of the site and to identify mitigation measures to ameliorate the impact. According to the South African vegetation map, the site is located inside Canca Limestone Fynbos, but also in close proximity to Albertinia Sand Fynbos and Southern Cape Valley Thicket.



Map 1 Satellite photo showing the position of the site (red symbol) north of Still Bay.

2 PROPOSED PROJECT

The project entails the extension of an existing cemetery by 1.83 ha on the eastern side of Melkhoutfontein (see Map 2). It is directly accessible from the bypassing Rooipitjie Road. Additional infrastructure includes the extension of an internal gravel road, extension of an existing water line and taps, and construction of a (precast!) boundary wall.

3 TERMS OF REFERENCE

- Identify and describe biodiversity patterns at a community and ecosystem level (main vegetation type, plant communities and threatened/vulnerable ecosystems), at species level (Species of Conservation Concern, protected species, presence of alien species)

and in terms of significant landscape features;

- Describe the sensitivity of the site and its immediate surroundings;
- Map the distribution and infestation levels of invasive alien plants;
- Identify the botanical constraints and potential development opportunities of the site;
- Review the relevant biodiversity plans compiled in terms of the National Environmental Management Biodiversity Act (Act 10 of 2004);
- Adhere to the Department of Environmental Affairs & Development Planning (DEA&DP) and CapeNature guidelines for biodiversity studies in the Western Cape.



Map 2 Satellite photo showing the position of the study area and footprint of the proposed extension area.

4 METHODOLOGY

A botanical survey of the site was undertaken on 15 June 2020 by Mark Berry (see CV attached). A qualitative assessment of the type and condition of affected vegetation on site, disturbance, and presence of alien species and Species of Conservation Concern was carried out. Plant species not identified in the field, were collected and/or photographed and identified at the office. The 2012 South African Vegetation Map and the latest floristic taxonomic literature and reference books were used for the purpose of this specialist study. Any plants classified as rare or endangered in the Red List of South African Plants online database are highlighted. The assessment follows Brownlie's (2005), CapeNature and other relevant guidelines for biodiversity assessments.

The following information was recorded during the site visit:

1. The condition of the vegetation. Is the vegetation either disturbed or degraded? A

disturbed or degraded area could range from agricultural fields (fallow land), or areas previously disturbed by construction activities, to an area that has been severely eroded or degraded as a result of bad land management or alien infestation.

2. The species diversity. This refers to the numbers of different indigenous plant species occurring on site. Indigenous fauna observed was also noted.
3. Species of Conservation Concern, as well as protected tree species occurring on site. This would include rare, vulnerable, endangered or critically endangered species. Species listed as vulnerable were mapped using Easy GPS v2.5 software on an iPhone. Accuracy is given as ± 4 m.
4. Identification of the vegetation type(s) and communities (if discernible) on the site. This would include trying to establish the known range of a vegetation type and whether or not this vegetation type is vulnerable (VU), endangered (EN) or critically endangered (CR).

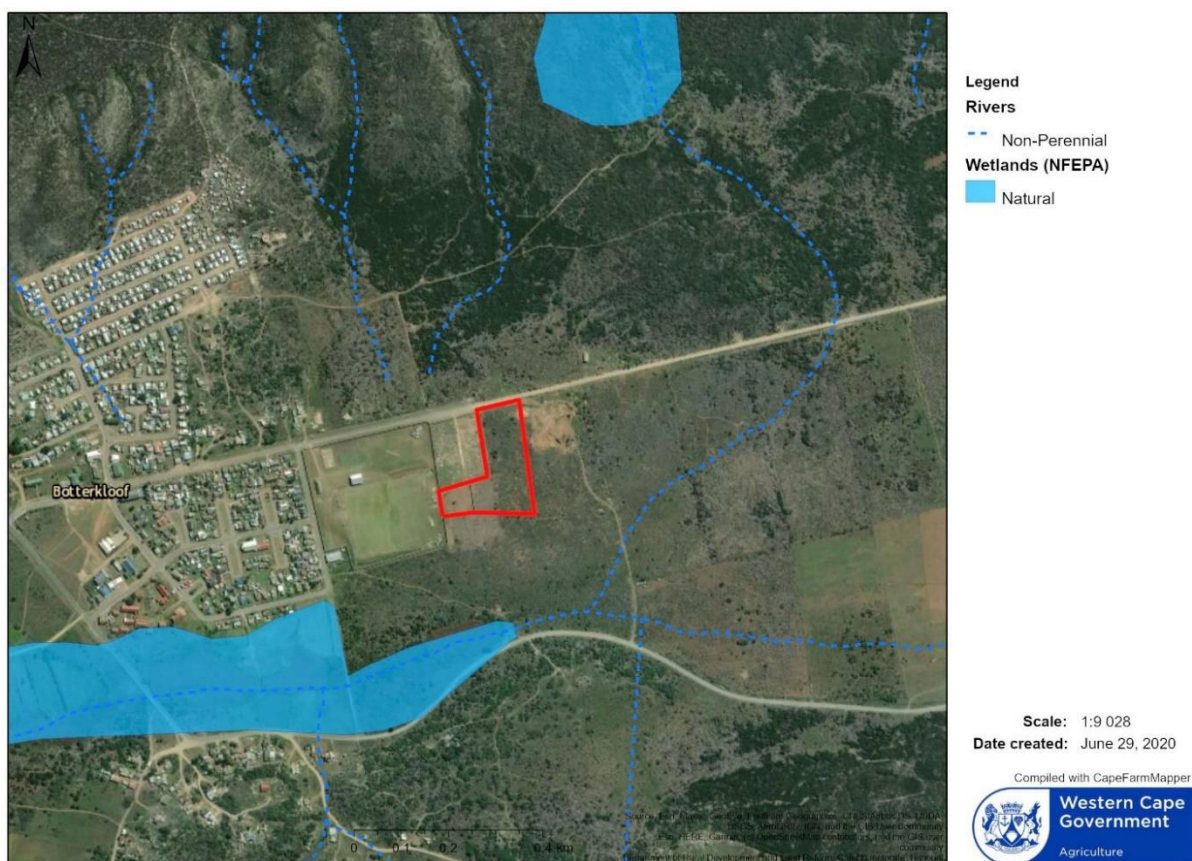
5 LIMITATIONS TO THE STUDY

Since fieldwork was carried out during winter (June), flowering plants that only flower at other times of the year (e.g. autumn and spring), such as certain bulbs, may have been missed. The overall confidence in the completeness and accuracy of the botanical findings is however considered to be good and no follow-up survey is considered necessary to aid decision making.

6 LOCALITY & SITE DESCRIPTION

The study site is located in a dip on the elevated coastal plain 5 km north of Still Bay in the Southern Cape. The coastal plain, which rises to over 200 m above sea level, has been incised by the Goukou River and its many tributaries. The latter arises in the Langeberg Mountains some 40 km away to the north. While extensive areas around Still Bay are covered with good quality fynbos, agriculture has transformed most of the valleys, converted it into grazing pastures (dairy farms). Considerable rooikrans (*Acacia cyclops*) infestation was noted in the disturbed areas around the site.

The settlement of Melkhoutfontein is located directly to the west of the site, with the R305 main road and Goukou River a little bit further away. The site is not affected by any watercourses, but a fairly large NFEPA wetland system (channelled valley-bottom wetland) has been mapped about 200 m to the south of the site, which extends westwards towards the Goukou (see Map 3). No watercourses or wetlands was found on or directly adjacent to the site during the site survey. Significant disturbance (earthmoving activities) was noted directly east of the site.



Map 3 Satellite photo illustrating the surface hydrology of the study area.

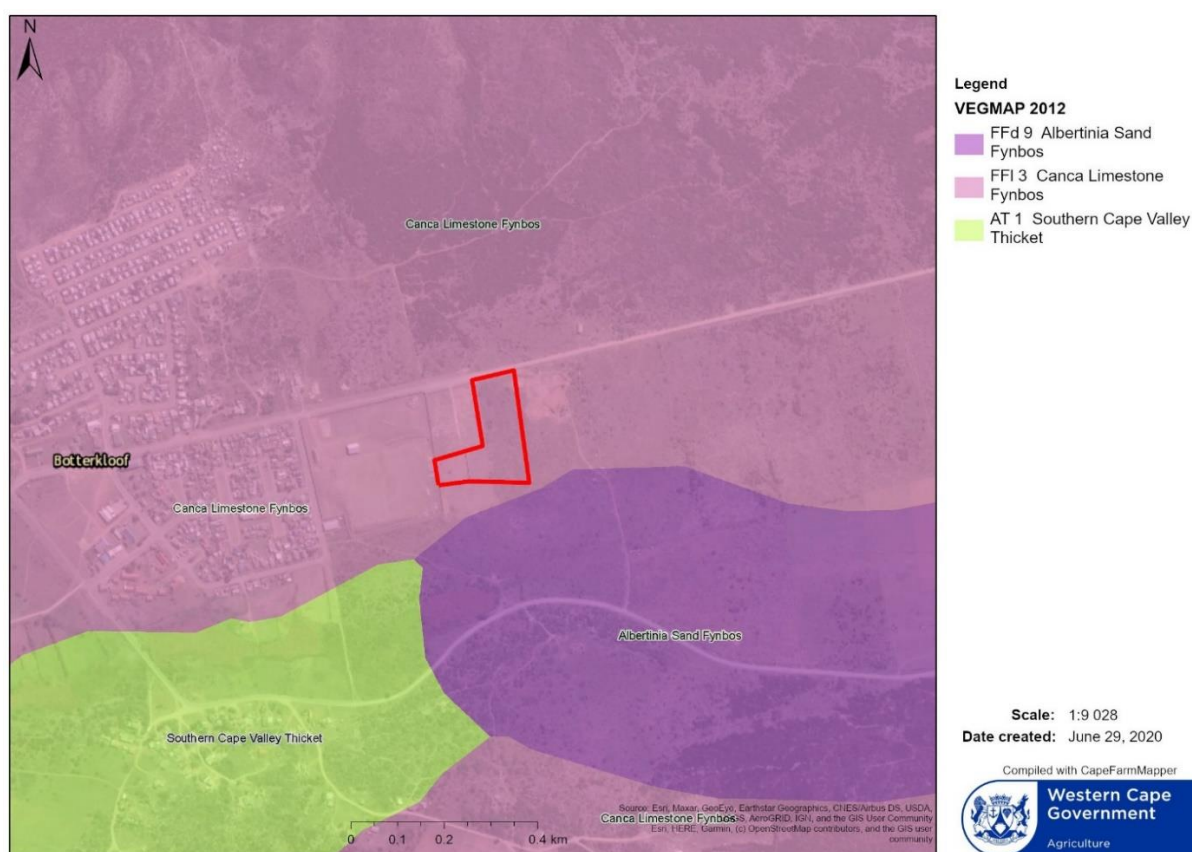
Still Bay is located in a relatively dry part of the Southern Cape. The mean annual rainfall for the area is around 400 mm (as per Cape Farm Mapper climatic data for 1950 to 2000). The rainfall is evenly spread from March to November (i.e. from autumn to the end of spring), while the driest period are the months of December and January (summer). Mean daily maximum and minimum temperatures are 26.9°C and 6°C for January/February and July, respectively (as per Cape Farm Mapper climatic data). Frost occurs on average only about three days per year (Mucina & Rutherford 2006).

According to the 3420 Riversdale 1:250 000 geological map, the geological formations underlying the site are identified as the Wankoe Formation, which belong to the Bredasdorp Group, and light-grey to pale-red sandy soil. The Wankoe is a Tertiary deposit consisting of calcarenite with aeolian cross-bedding and calcrete lenses. Exposed calcrete can be seen on the hillslope to the north of the site. This site itself is described as sandy.

7 BIOGEOGRAPHICAL CONTEXT

Being located on the Southern Cape coastal plain, the site occurs in a typical fynbos environment. This is confirmed by the presence of characteristic fynbos species, such as *Leucospermum praecox* and *Thamnochortus erectus*. The Vegetation Map of South Africa

(Mucina & Rutherford 2006) classifies the vegetation on site as Canca Limestone Fynbos (see Map 4). This unit stretches across the Southern Cape lowlands from Witsand (Cape Infanta) in the west to the Mossel Bay area in the east. In a further refinement by Vlok & de Villiers (2007), the site lies on the boundary between Hectorskraal Thicket-Limestone Fynbos and the Goukourivier River and floodplain unit. In the former, limestone fynbos communities dominate in the presence of thicket clumps, with tall *Olea europaea* and *Sideroxylon inerme*, as well as endemics such as *Lampranthus fergusoniae* and *Acmadenia densifolia*. The latter endemics were recorded by the author on the higher limestone slopes to the northwest of the site.

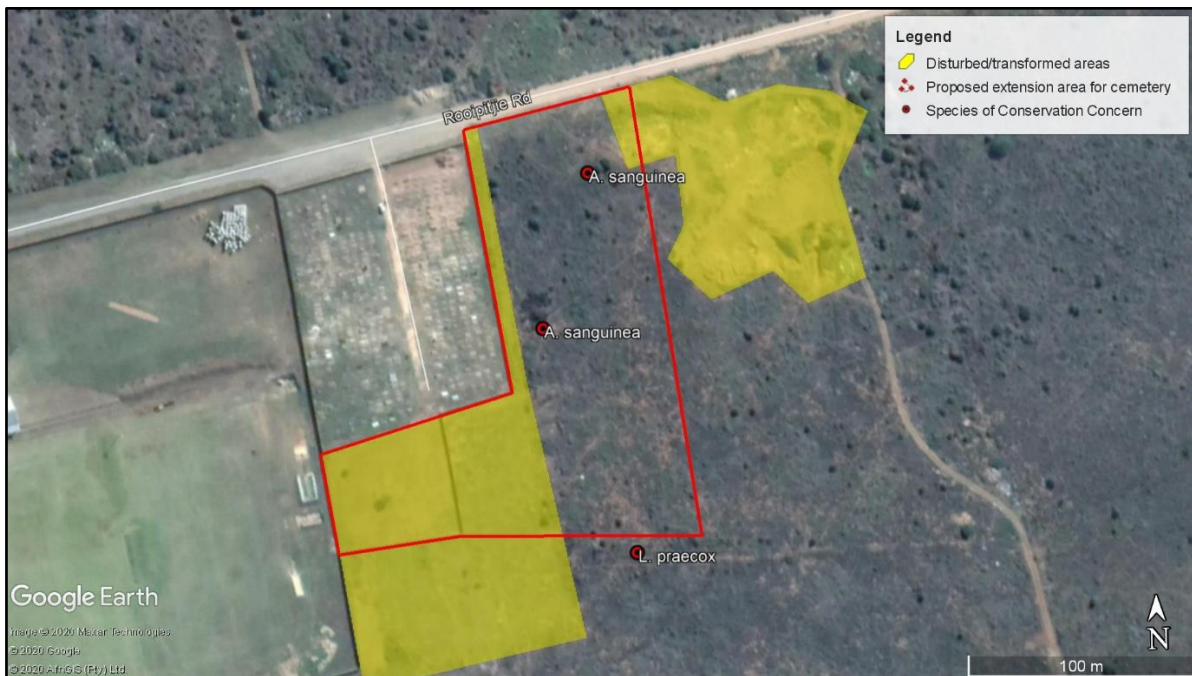


Map 4 Extract of the 2012 SA Vegetation Map, showing the position of the site (outlined in red) inside Canca Limestone Fynbos.

Other major vegetation units found in the immediate area of the site include Albertinia Sand Fynbos (on deep sands along the coast and further inland) and Southern Cape Valley Thicket (along riverine areas, such as the Goukou and Gourits River). All these units are still well represented in the larger area. Southern Cape Valley Thicket is the most transformed vegetation type, with 65% remaining. Albertinia Sand Fynbos is currently listed as Vulnerable, while Canca Limestone Fynbos and Southern Cape Valley Thicket are listed as Least Threatened (DEA 2011). However, Southern Cape Valley Thicket is proposed for a Vulnerable status in the more recent Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.* 2017).

8 VEGETATION & FLORA

Due to the sandy substratum encountered on site and the presence of species characteristic to both Albertinia Sand Fynbos (e.g. *Leucospermum praecox* and *Thamnochortus erectus*) and Canca Limestone Fynbos (e.g. *Aspalathus sanguinea*), one can argue that the fynbos on site is transitional between the two types. Having said this, the vegetation is degraded and species poor, with certain areas devoid of significant fynbos (see Map 5 & Photos 1-3). The disturbance can be attributed to the presence of the adjacent cemetery, earthmoving activities on the eastern side and past agricultural activities. Structurally, it can be described as a low (± 0.8 m) closed (80-90%) small-leaved shrubland following Campbell's (1981) classification. A few scattered *Acacia cyclops* (rooikrans) and single *Leucospermum praecox* (>2 m) are prominent emergent species on site. The disturbed areas are covered by herbaceous weeds/shrubs and grasses.



Map 5 Aerial photograph showing the biodiversity attributes of the site.

Indigenous shrub species recorded include *Osteospermum moniliferum*, *Metalasia muricata*, *Seriphium plumosum*, *Helichrysum patulum*, *Chrysocoma ciliata* (dom), *Aspalathus sanguinea*, *Searsia glauca*, *S. laevigata*, *Olea europaea*, *Gymnosporia buxifolia*, *Leucospermum praecox*, *Muraltia spinosa*, *Gnidia squarrosa* (dom), *Passerina corymbosa*, *Asparagus* spp (dom), *Rubia petiolaris*, *Chironia baccifera*, *Tetragonia fruticosa*, *Solanum linnaeanum* and *Withania somnifera*. Spreading succulents recorded include *Carpobrotus edulis*, *Mesembryanthemum parviflorum* and *Conicosia pugioniformis*. *Asparagus asparagoides* is the only scrambler encountered. Hemicryptophytes and geophytes recorded include *Thamnochortus erectus*, *Pelargonium triste* and *Brunsvigia orientalis*. Signs of dekriet harvesting were observed on site. The survey was unfortunately too early for the normal suite of spring flowering bulbs.



Photo 1 Transformed southern part of the site, covered by herbaceous species and grasses.



Photo 2 Disturbed north-eastern corner of site



Photo 3 Shrubby central part of site, dominated by *Gnidia squarrosa*. Insert: *Leucospermum praecox*

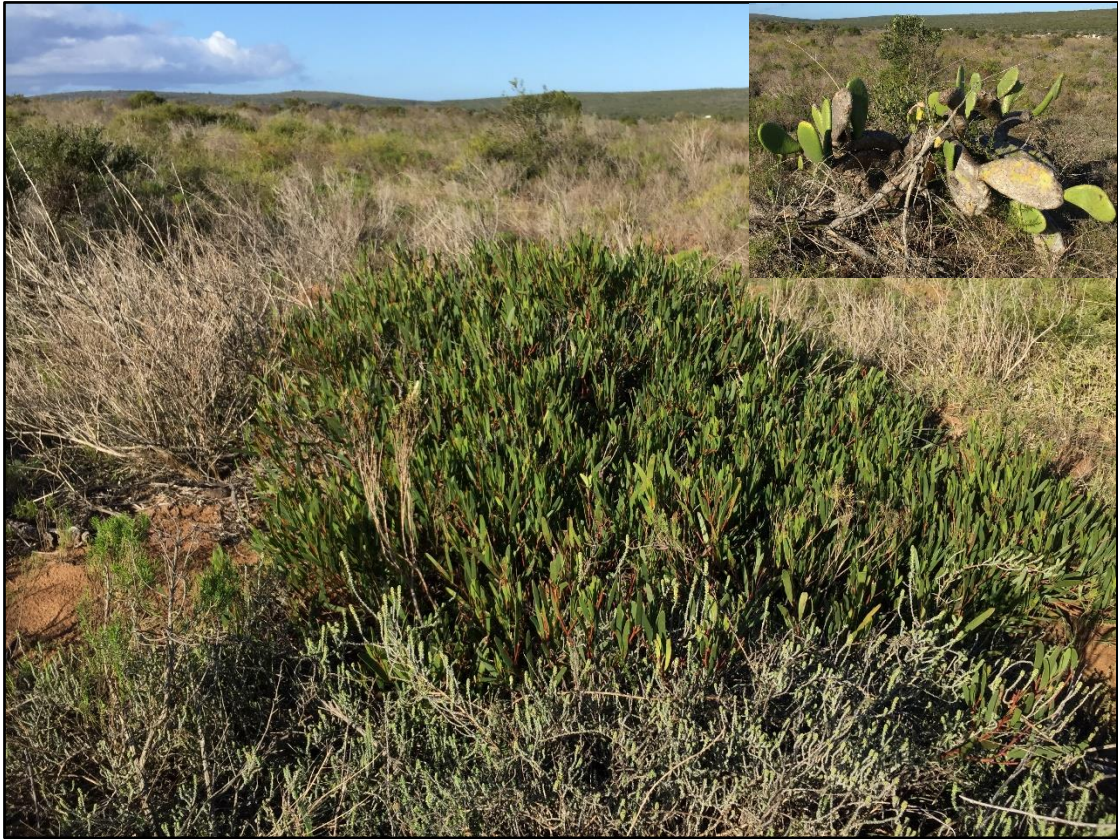


Photo 4 A stunted rooikrans. Insert: *Opuntia ficus-indica*

Invasives recorded (albeit in low numbers) include *Acacia cyclops* (rooikrans), *Opuntia ficus-indica* (prickly pear) and *Verbesina encelioides* (wild sunflower) (see Photo 4 above). Rooikrans and prickly pear are listed invasive aliens (Category 1b) in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) Alien and Invasive Species List (2016).

Two Species of Conservation Concern¹ were recorded, namely *Aspalathus sanguinea* (two patches; Near threatened) and *Leucospermum praecox* (a single shrub just outside the footprint area; Vulnerable). The former (see Photo 5) was also observed (by the author) on the limestone hill slopes to the northwest. Both are regional endemics. All the other recorded species are widespread and common. At least six other Species of Conservation Concern are known from the general area, namely *Metalasia calcicola*, *Protea obtusifolia*, *Wiborgiella sessilifolia*, *Acmadenia densifolia*, *Lampranthus fergusoniae* and *Delosperma mariae*. These were recorded by the author on a previous occasion in the limestone fynbos to the north of the village (northwest of the site).



Photo 5 Patch of *Aspalathus sanguinea*. Insert: close-up of *A. sanguinea*

There are also historical records of other Species of Conservation Concern from the Melkhoutfontein area, including *Lampranthus diutinus* and *Euryops muirii*. The latter was

¹ <http://redlist.sanbi.org/index.php>.

discovered here, but is now believed to be locally extinct due to housing development². *L. diutinus* is probably also locally extinct due to farming activities³. Their habitat is continuously shrinking due to coastal developments and crop cultivation. Other threats include alien plant infestation and irregular fire regimes.

9 CONSERVATION STATUS & BIODIVERSITY NETWORK

Being well represented in the larger area, Canca Limestone Fynbos is currently not considered a threatened vegetation type. However, agricultural activities, alien plant infestation and coastal developments remain major threats for certain species restricted to this vegetation type. According to Mucina & Rutherford (2006), 86% of Canca Limestone Fynbos is still left. However, due to its poor conservation status its protection in the coastal areas remains a priority. Less than 1% is formally conserved in the Pauline Bohnen and Geelkrans Nature Reserves (Mucina & Rutherford 2006). Albertinia Sand Fynbos, on the other hand, is listed as Vulnerable (DEA 2011). About 57% of it is still left, while 5% is formally protected in De Hoop, Pauline Bohnen, Geelkrans, Kleinjongensfontein, Blomboschfontein and Skulpiesbaai Nature Reserves (DEA 2011). These ratings are reaffirmed in the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.* 2017).

The entire site, which falls inside the Hessequa Biodiversity Network, has been mapped as a terrestrial critical biodiversity area (CBA) (see Map 6). It forms part of an extensive biodiversity (CBA) corridor that runs in a west-east direction from the Duiwenhoksrivier (in the west) to the Gourits River (in the east) across the Goukou, linking several nature reserves along the way. Apart from providing a backbone to the local biodiversity network, the corridor serves as an important passage along which fauna can migrate across the lowlands. Reasons for the inclusion of the site and its surrounding area in the CBA network include the presence of threatened vegetation types, a FEPA river corridor and a climate adaption corridor. The non-perennial watercourse and associated wetlands to the south of the site have been mapped as an aquatic (river and wetland) CBA. The latter connects again with the Goukou River and its floodplain.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet *et al.* 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet *et al.* 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors.

² <http://redlist.sanbi.org/species.php?species=3048-83>

³ <http://redlist.sanbi.org/species.php?species=88-61>

Loss of designated CBA's is therefore not recommended. ESA's, on the other hand, are supporting zones required to prevent the degradation of CBA's and Protected Areas.



Map 6 Biodiversity network map, with the site outlined in red.

10 IMPACT ASSESSMENT

About 1.22 ha of degraded fynbos will be directly affected by the project. The rest of the site (0.61 ha) has been transformed by past disturbances and considered to be of little botanical value. Considerable effort will be needed to restore or rehabilitate it back to fynbos, which will require the re-introduction of selected indigenous plant species, alien control, etc. The degraded fynbos, however, still has value in contributing to the local biodiversity and as a potential source for plant material. It is assumed that no construction activities associated with the project will take place outside the proposed footprint area. During the construction phase care must be exercised to avoid the unnecessary disturbance of the adjacent veld, which must be left intact. Already disturbed/transformed areas (as shown on Map 5) should be used for the accommodation of construction plant, construction material, offices, etc. during the construction phase. Due to the affected vegetation type(s), namely Canca Limestone Fynbos and Albertinia Sand Fynbos, being reasonably well represented in the region, the impact on vegetation type *per se* is of a low to moderate concern.

At least one Species of Conservation Concern, namely *Aspalathus sanguinea* (two patches), will be affected. However, it is also present on the surrounding hillslopes where the author and others have recorded it. *Leucospermum praecox* (a single shrub just outside the footprint area) is probably safe from the project. All the other recorded species are widespread and common. Search and rescue of suitable species (e.g. bulbs and cuttings of succulents) can be considered for the rehabilitation of disturbed areas. Most of the species which originally occurred on site will return to the disturbed areas, including the aliens. As an indirect impact, soil disturbance caused by earthworks will provide ideal conditions for the establishment of invasive aliens, such as *Acacia cyclops*. As an operational phase impact, alien control will be required on and around the site as an ongoing management concern. Table 1 below summarises the impact on vegetation type, habitat and species.

Table 1 Impact on vegetation type, habitat and species.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance – Current site option	Confidence
Without mitigation	Limited to site	Permanent	High	High	Med (-)	Med-high
With mitigation	Limited to site	Permanent	High	High	Low (-)	Med-high
Mitigation measures: Demarcate/fence off the construction area; contain disturbance to the demarcated construction area; consider search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas; control aliens on and around the site as a long-term management requirement.						

Due to the degraded state of the site and its position next to an existing cemetery and residential area, the impact on the biodiversity (CBA) network is of a lesser concern. The aquatic CBA, located 200 m away, will also not be directly affected. The extensive CBA network around the site extending eastwards should also remain unaffected. A slight erosion of the network is however noted. Table 2 below summarises the impact on CBA's.

Table 2 Impact on the biodiversity network, CBA's, etc.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance – Current site option	Confidence
Without mitigation	Limited to site & surroundings	Permanent	Med	High	Low-med (-)	Med-high
With mitigation	Limited to site & surroundings	Permanent	Med	High	Low (-)	Med-high
Mitigation measures: Rehabilitate the areas disturbed during construction phase; control aliens as a long-term management requirement.						

11 CONCLUSION & RECOMMENDATIONS

The site accommodates fynbos transitional between Albertinia Sand Fynbos and Canca Limestone Fynbos. About 1.22 ha of degraded fynbos will be directly affected by the project. The rest of the site has been transformed and has little botanical value. The degraded fynbos, however, still has value in contributing to the local biodiversity and as a potential source for plant material. Two Species of Conservation Concern were recorded here, namely *Aspalathus sanguinea* (two patches) and *Leucospermum praecox* (a single shrub just outside the footprint area).

Due to the affected vegetation still being reasonably well represented in the region, the impact on vegetation type *per se* is of a low to moderate concern. It is therefore recommended (from a biodiversity perspective) that the project be allowed to proceed, subject to a few mitigation measures. During construction, mitigation should focus on the protection of veld adjacent to the works areas, and maybe the rehabilitation of the disturbed areas afterwards. The following mitigation measures should be considered:

- In order to minimise disturbance of the adjacent vegetation, the construction area should be demarcated/fenced off prior to the start of construction activities. No disturbance or spoiling may occur outside this area.
- Consider search and rescue of bulbs and cuttings of succulents for use in the rehabilitation of disturbed areas outside the cemetery footprint.
- Implement alien control on and around the site as a long-term management requirement.

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BRIEF CV OF SPECIALIST

M.G. (Mark) BERRY

ENVIRONMENTAL CONSULTANT & BIODIVERSITY SPECIALIST

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PROFESSIONAL STATEMENT

Environmental assessment professional and biodiversity specialist with over 20 years of experience mainly in the Western Cape Province, but also in the Northern Cape, Eastern Cape and Free State. Experience in Environmental Impact Assessments (EIA's), biodiversity assessments, Environmental Management Programmes (EMPr's), Environmental Control Officer (ECO) duties and environmental due diligence investigations.

WORK EXPERIENCE

- 1989-1990** Nature Conservation Officer in the South African Air Force, based at Langebaan Road Air Force Base
- 1997-2005** Employed as principal environmental specialist at Planning Partners, a multi-disciplinary consultancy specialising in town and regional planning, environmental planning and landscape architecture. Duties included the conducting of EIA's, compiling EMPr's, ECO duties, biodiversity surveys and status quo environmental assessments for spatial development frameworks.
- 2000-2006** Examiner for the Board of Control for Landscape Architects (BOCLA), responsible for the setting up and marking of the Environmental Planning Section of exam paper.
- 2005-current** Started Mark Berry Environmental Consultants in June 2005. Responsibilities include office management, seeking tenders, conducting EIA's, compiling EMPr's, construction site environmental audits, biodiversity surveys, etc. A relationship is maintained with previous employer, and, among other, undertook land-use surveys and reporting for the Eskom's site safety reports for three proposed nuclear power plants in the Western and Eastern Cape Provinces.

QUALIFICATIONS

- BSc (1988) University of Stellenbosch
- BSc-Hons in Botany (1991) University of Stellenbosch
- MSc in Botany (1993) Nelson Mandela Metropolitan University
- PhD in Botany (2000) Nelson Mandela Metropolitan University.

PROFESSIONAL MEMBERSHIP

Professional member (reg. no. 400073/98) of the South African Council for Natural Scientific Professions (SACNASP).

REFERENCES

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Prof Eileen Campbell (Department of Botany, Nelson Mandela Metropolitan University)

Phone: (041) 504-2329, e-mail: Eileen.Campbell@nmmu.ac.za

DECLARATION OF INDEPENDENCE

I Mark Gerald Berry, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
 - **other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity**; or
 - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the Specialist:



Name of Company:

Mark Berry Environmental Consultants

Date:

2 July 2020