Botanical & Terrestrial Biodiversity Impact Assessment
Portion 19 of Farm Misgunst Aan de Gouritz Rivier 257, Mossel Bay, near Vleesbaai, Western Cape Province

Botanical Surveys & Tours

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Report prepared for Cape EAPrac

September 2020; October 2021; updated 7 March 2022

National Legislation and Regulations governing this report

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended.

Appointment of Specialist

David J. McDonald of Bergwind Botanical Surveys & Tours CC was appointed by Cape EAPrac, to undertake an initial screening assessment of Portion 19 of Farm 257, Mossel Bay, near Vleesbaai in the Mossel Bay Municipality, Western Cape Province, and thereafter and impact assessment of the proposed development (this report).

Details of Specialist

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Expertise

Dr David J. McDonald:

- Qualifications: BSc. Hons. (Botany), MSc (Botany) and PhD (Botany)
- Botanical ecologist with over 40 years' experience in the field of Vegetation Science.
- Founded Bergwind Botanical Surveys & Tours CC in 2006
- Has conducted over 400 specialist botanical / ecological studies.
- Has published numerous scientific papers and attended numerous conferences both nationally and internationally (details available on request)

Curriculum Vitae – Appendix 3

Independence

The views expressed in the document are the objective, independent views of Dr McDonald and the study was carried out under the aegis of, Bergwind Botanical Surveys and Tours CC. Neither Dr McDonald nor Bergwind Botanical Surveys and Tours CC have any business, personal, commercial or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Bergwind Botanical Surveys & Tours CC, its staff and appointed associates, reserve the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

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Declaration of independence:

I David Jury McDonald, 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
- 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:

Bergwind Botanical Surveys & Tours CC

Name of company:

Date: 25 September 2020; amended 28 October 2021 and 7 March 2022

CONTENTS

1. Introduction

Bergwind Botanical Surveys & Tours CC (Dr D.J. McDonald) was appointed to conduct a brief screening assessment to determine the vegetation type and ecological sensitivity of Portions 19 of Farm Misgunst Aan de Gouritz Rivier 257, Mossel Bay, Western Cape Province (shortened to Farm Misgunst 19/257, 'the property' or the 'study site'). The objective was to assist the landowner to determine the most suitable location for the dwelling and other proposed buildings.

Following the screening assessment, a site development plan (SDP) was developed, and the potential impact of the proposed development is tested here through an impact assessment process.

The general vegetation type found and the specific vegetation on the original three possible footprints was described, and that part of the screening assessment report is included here to inform the impact assessment. The report places the vegetation in a regional context from a conservation perspective and the investigation follows published guidelines for evaluating potential impacts on the natural vegetation as they pertain to the study area (Brownlie 2005; Cadman, 2016). The requirements and recommendations of CapeNature and the Botanical Society of South Africa for assessment of biodiversity of proposed development sites have also been considered as well as the 2020 Species Environmental Assessment Best Practice Guideline for terrestrial biodiversity specialists (Government Gazette, 2020; Enviro Insight, 2020) have been applied.

Plants considered suitable for a surrounding 'garden' are suggested in the concluding paragraphs.

2. Terms of Reference for the Screening Assessment

- Provide a broad, baseline description of the vegetation of the study area, placing it in a regional context. Reference should also be made to any bioregional maps of the area.

- Describe the vegetation communities and associated conservation value/sensitivity of the study area and identify any areas of specific concern (e.g. high sensitivity and/or conservation status).

- Provide specific information relating to the vegetation in the study area, with reference to any species of special concern and their conservation status, which can be used as baseline information for the assessment of potential impacts of the proposed project.

- Determine the optimal site for the proposed house and assess the impacts of the proposed activity on the vegetation.

- Recommend appropriate, practicable mitigation measures that will reduce all major (significant) impacts or enhance potential benefits, if any.

- Provide suggestions as to which indigenous species can be used around the house to provide cover and protection from wind-blown sand.

3. Terms of Reference for the Impact Assessment

- Consider the site development plan for the property and provide an assessment of potential impacts on the vegetation and flora.
- Recommend mitigation measures where applicable.

4. Study Area

4.1 Location

Portion 19 of Farm Misgunst Aan de Gouritz Rivier 257, is located on the south side of the headland known as Vleespunt, almost directly south of Vleesbaai town. About half the property is located on the vegetated dunes half the property lies in the Fransmanshoek active dune field. The dunes form a high crest at about 70 m above mean sea level and then slope steeply downwards to the seashore (Figure 1).

Figure 1. The location of the study site on Portion 19 of Farm Misgunst aan de Gouritz Rivier 257, Mossel Bay (Base map: 1:50 000 Map 321 BD Gouritsmond, 3rd Edition).

Figure 2. Google Earth™ aerial image showing the farm portion in relation to other important landmarks.

4.2 Physiography of the study site

The aspect of the site is southerly to south-westerly and it looks over Visbaai towards Kanonpunt (Cape Vacca) (Figures 1 & 2).

The climate is mild with rain occurring in all months of the year with peaks in autumn (April) and spring (October). Mean annual precipitation is between 261 mm and 666 mm. The mean monthly maximum temperature is 25.19 °C in February and mean monthly minimum is 6.47 °C in July.

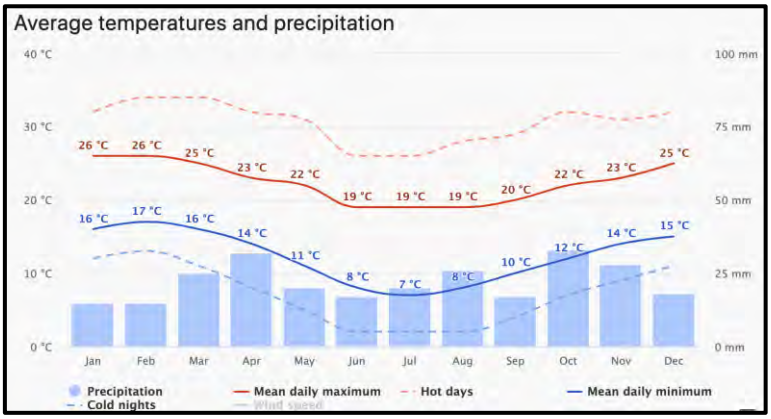


Figure 3. Average temperatures and precipitation for Vleesbaai that is applicable to Fransmanshoek as well.

The soil consists of aeolian (windblown) sand and in places a calcrete horizon is visible on the surface. The Fransmanshoek dune field above the beach has been intentionally stabilized in places by the introduction of exotic Marram grass.

The access road to the site exits from the main Fransmanshoek Road and traverses the vegetated dunes, through Hartenbos Dune Thicket. The entire road is on sandy soil.

4.3 Disturbance regime

The Fransmanshoek area is generally heavily invaded by alien invasive woody plants, particularly *Acacia cyclops* (rooikrans; rooipitjie). Other species such as *Myoporum spp.* (Manatoka) occur sporadically and *Ricinus communis* (castor oil -semi-woody shrubs) are prevalent on open cleared areas. Clearing of rooikrans has happened from time-to-time and the cut branches have been used to cover open, exposed areas to prevent sand movement by wind (blowouts). It was noted, however, that because the packing of the branches is too dense, this practice has had a negative effect on the natural vegetation by stifling growth of the indigenous vegetation found on the dunes. It is accepted practice to use this method, but the packing must be not as dense as has been the case. This is discussed further below.

The three proposed alternative sites are located at the 'end' of the access road on the dunes that are becoming stable and not on the densely vegetated secondary dunes where Hartenbos Dune Thicket is found. The main disturbance factor at these alternative sites is wind movement of sand. As mentioned above, attempts have been made to stabilize the sand using exotic Marram grass (*Ammophila arenaria*), a grass native to Europe and western Asia.

A maze of roads has been made through the dune thicket vegetation and it will be necessary to close all but the main access road to the site to prevent further degradation of the dune thicket. The openings (criss-cross of roads) provide fertile opportunity for invasion by alien woody plants.

5. Limitations and Assumptions

The site is accessible using a 4x4 vehicle but is inaccessible using a 2x4 or sedan vehicle. Access was limited to a certain point and from there the survey was carried out on foot. A second limitation was determining the exact footprint of the proposed dwelling. The landowner pegged the site with poles but, even so, it was not clear in the field exactly where each footprint option was located. The precision of the footprint was, however, not critical from a botanical and a terrestrial biodiversity perspective. All the footprint options are located on the stabilizing dune as opposed to being located in Hartenbos Dune Thicket on the more stable inland dunes.

No other limitations were experienced, and no assumptions were made.

6. Methods

The site was visited on 28 February 2020 for approximately four hours. The site was accessed first by vehicle to a suitable location for parking. The survey was then undertaken on foot. The survey track was recorded on both a Garmin GPSmap 66s as well as on the Gaia GPS app on an Apple iPhone XR. Waypoints were recorded at locations representative of specific features on the property and geotagged photographs were taken at those sites. Several poles had been placed at the alternative footprint sites by the landowner and particular attention was paid to the vegetation around these marker poles. Owing to a misunderstanding, the Option 1 site was not recorded as a GPS waypoint. However, the Option 1 site crossed on the survey track and several photos were unwittingly taken at the location. The relevant photos were retrospectively linked to the survey track as shown under the heading Option 1, below. The survey route with waypoints is shown in Figures 4a & 4b.

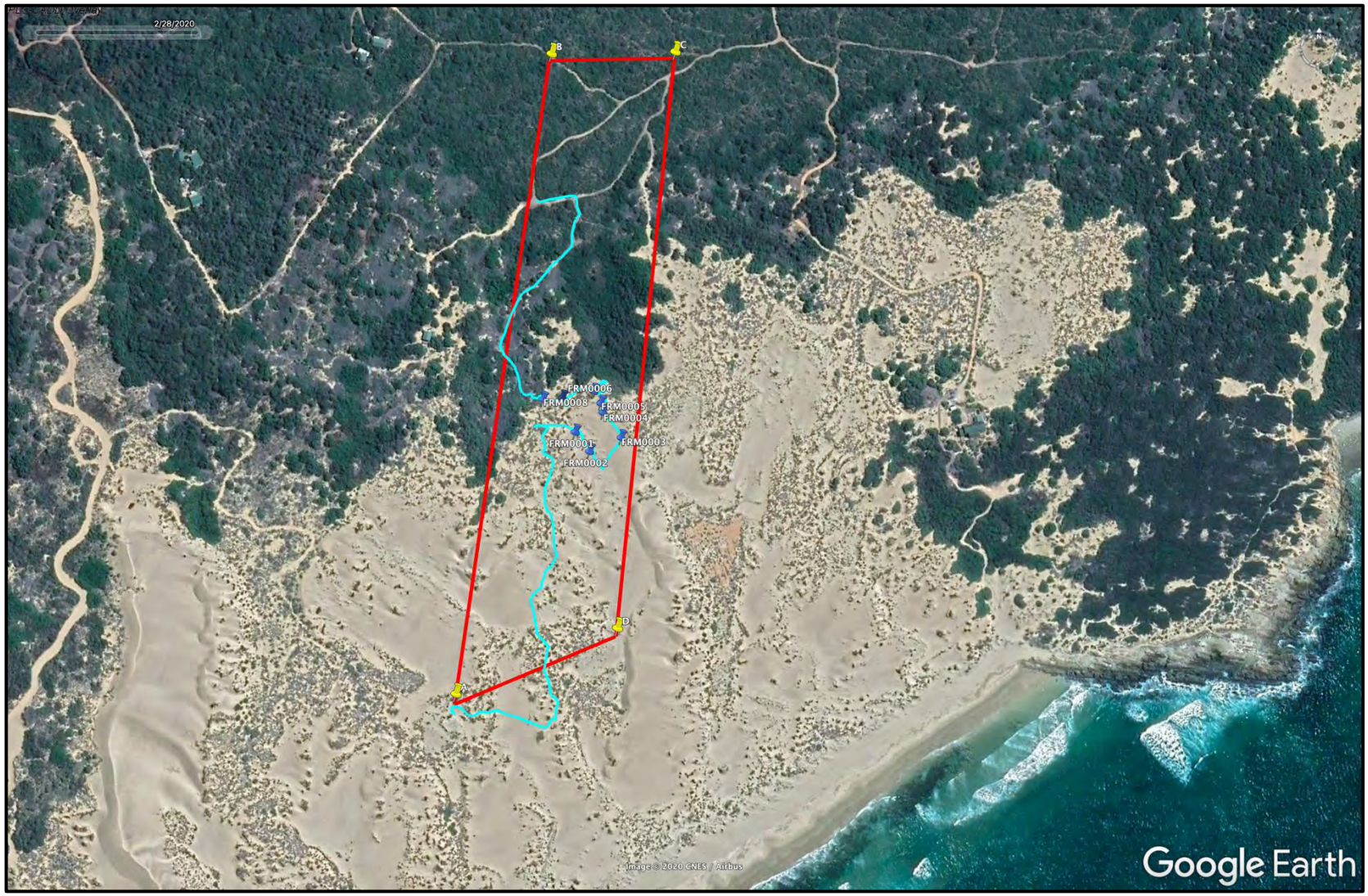


Figure 4a. Google Earth ™ aerial image with Portion 19 of Farm 257 superimposed. The light blue line represents the survey track, with waypoints.

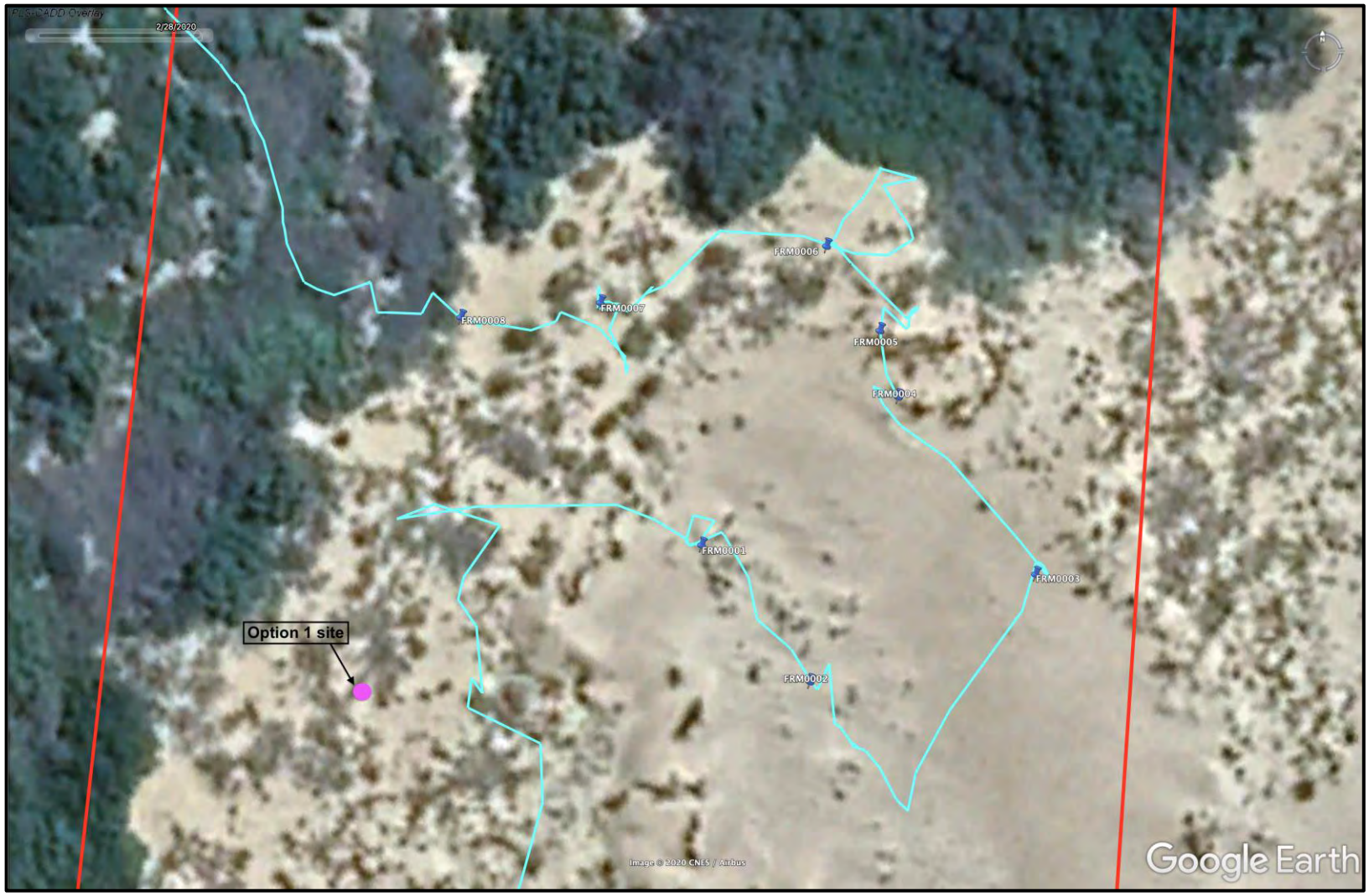


Figure 4b. Google Earth ™ aerial image with part of Portion 19 of Farm 257 superimposed i.e. the area of interest for the construction of a dwelling. The survey track (light blue) with waypoints mostly (except for FRM0008) at the pegs placed by the landowner.

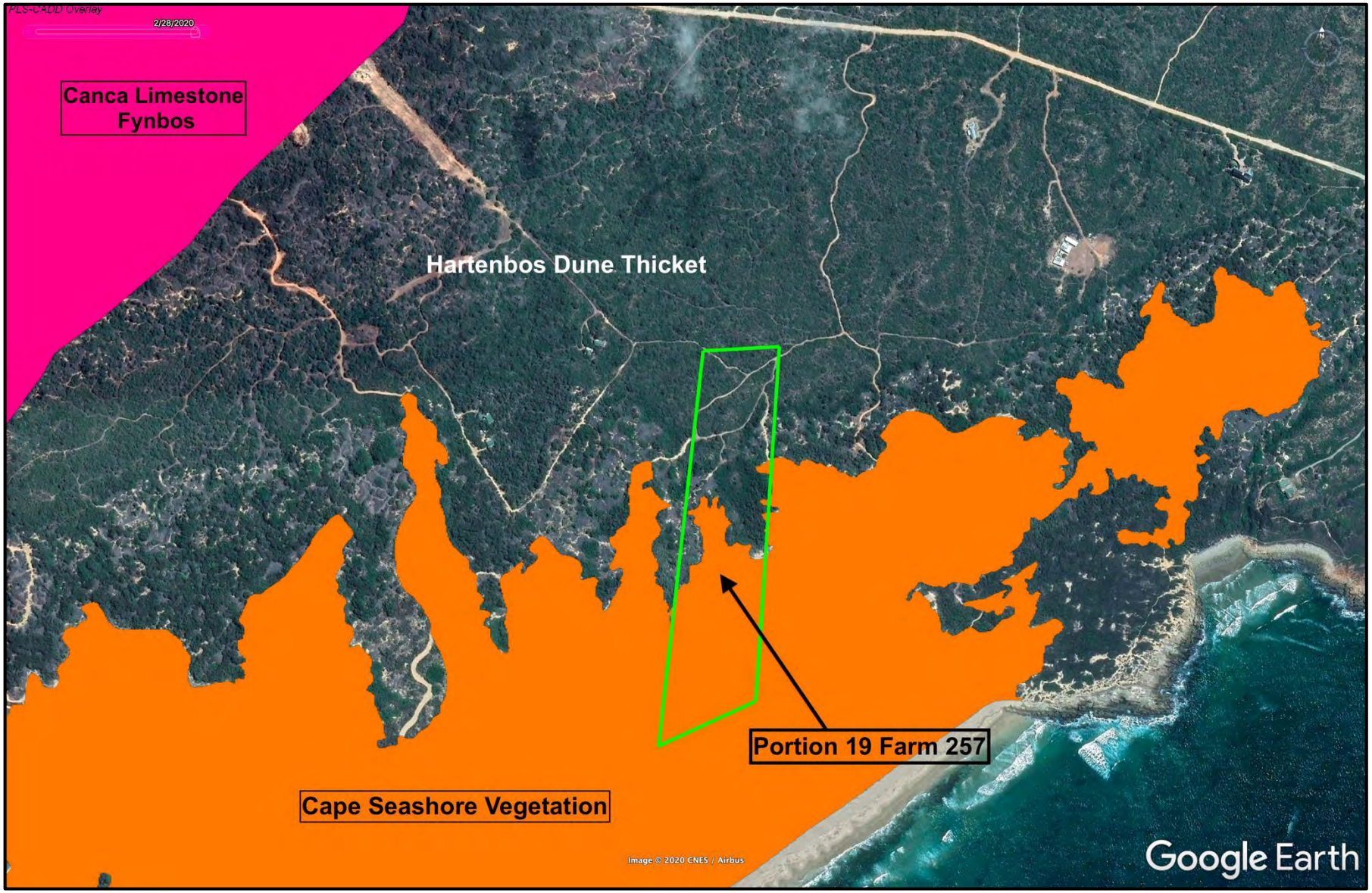


Figure 5. Google Earth ™ aerial image with Portion 19 of Farm 257 superimposed together with the VEGMAP (2018) indicating the vegetation types present.

7. The Vegetation

The vegetation on the property consists of two distinct types that grade into one another. The vegetation found on the foredunes is **Cape Seashore Vegetation** as classified by Mucina *et al.* (2006 in Mucina & Rutherford, 2006). This vegetation occurs above the high-water mark inland to the high primary dunes. The second type is **Hartenbos Dune Thicket**, a newly described type (Grobler *et al.* 2018) and mapped by SANBI (2018) (Figure 5) that replaces the former classification of the vegetation as **Groot Brak Dune Strandveld** (Rebelo *et al.* 2006 in Rutherford & Mucina, 2006).

7.1 Hartenbos Dune Thicket

In the study area Hartenbos Dune Thicket is found on the 'inland' 50 percent of the property. It occurs on the undulating dunes and is described by Grobler *et al.* (2018) as follows: "A mosaic of low (1—3m) thicket, occurring in small bush clumps dominated by small trees and woody shrubs, in a mosaic of low (1—2m) asteraceous fynbos. Thicket clumps are best developed in fire-protected dune slacks, and the fynbos shrubland occurs on the upper dune slopes and crests." These authors also refer to the occurrence of succulent karroid elements, but these were not found in the study area.

The dune thicket would not be influenced in any way by the proposed dwelling footprint. However, the access road runs through the Hartenbos Dune Thicket. A limited amount of further clearing of dune thicket would be required to formalize the access road but in general this vegetation would not be significantly negatively impacted.

Plant species recorded in the Hartenbos Dune Thicket include *Acacia cyclops**, *Agathosma cerefolium* (Figure 14), *Chironia baccifera*, *Cynanchum ellipticum, Diospyros dichrophylla, Gymnosporia heterophylla, Jamesbrittenia tenuifolia* (Figure 15)*, Lycium* sp., *Metalasia muricata, Myoporum spp.*, *Olea exasperata, Osteospermum moniliferum, Osyris compressa, Pterocelastrus tricuspidatus, Searsia crenata, Searsia lucida, Searsia pterota, Sideroxylon inerme* and *Tarchonanthus littoralis* (Figure 16)*, Zygophyllum morgsana* (Figure 17). (Note: This list of species is not exhaustive).

Figure 6. The access track to the property running through dunes vegetated with Hartenbos Dune Thicket.

Figure 7. Hartenbos Dune Thicket with some invasion by alien *Acacia cyclops.*

Figure 10. Dry branches of cleared alien invasive rooikrans (*Acacia cyclops*) stacked next to the access road. This is not desirable since it suppresses the natural regeneration of the dune thicket. The branches should be chipped.

Figure 11. *Cynanchum ellipticum* (Apocynaceae), a creeper, clambering over a stack of dead branches of cleared alien invasives.

Figure 12. *Ricinus communis* (castor oil) that invades open, disturbed places. It should be eradicated as soon as possible.

Figure 13. A dense shrub of *Searsia crenata* (dune crowberry) – a highly suitable candidate for cultivation.

Figure 14. *Agathosma cerefolium*

Figure 15. *Jamesbrittenia tenuifolia*

Figure 16. *Tarchonanthus littoralis*

Figure 17. *Zygophyllum morgsana*

Figure 18. *Arctotheca populifolia* with white arrow indicating the cryptic flowers.

Figure 19. The remains of a plant of *Arctotheca populifolia,* with the hummock of sand that accumulated around the plant.

Figure 20. *Seriphium plumosum*

Figure 21. *Lessertia canescens* (cancer bush).

7.2 Cape Seashore Vegetation

Cape Seashore Vegetation varies along the Cape West Coast and Cape Southern Coast depending on the degree of disturbance of the beaches and whether there is rock outcropping at the surface or not. Where it occurs, the vegetation is herbaceous or consists of dwarf-shrub vegetation, sometimes with succulent species (Mucina *et al.* 2006).

At the study site, Cape Seashore Vegetation is poorly developed since the dunes above the high-water mark are mobile due to strong winds either from the northwest, southwest or southeast. The type of dune system found at the study site is classified as a 'Composite Barrier Dune' by Heydoorn & Tinley (1980). However, the movement of sand has been limited (but not completely stabilized) by the introduction of exotic Marram grass (*Ammophila arenaria*) (Figure 23). This tussock grass species, that grows to about 60 cm in height, largely dominates the stabilizing dune field on the seaward slopes. A few plants were found of indigenous species that are known to be foredune pioneer-species, notably the indigenous *Arctotheca populifolia* (sea pumpkin). This species most often occurs on the ephemeral or hummock dunes that are affected by high equinoxial tides and stormy seas; it is regarded as one of the 'sand-fixing' or sand-binding plants. The foredunes are built by sand accumulating around such plants (Heydoorn & Tinley, 1980). However, not much *Arctotheca populifolia*

occurs on the lower dune field due to the overriding presence of Marram grass. The specimen of *Arctotheca populifolia* shown in (Figure 18) was found relatively high up in the dune field. This species usually grows much closer to the high-tide mark on low hummock dunes.

The species diversity of the vegetation on the foredunes and within the dune field, with only a few prominent species accounting for more than 90 percent of the plants present (Figure 22). These species include *Ammophila arenaria**, *Arctotheca populifolia*, *Ficinia* sp., *Lessertia canescens*, *Passerina rigida*, *Senecio elegans* and *Seriphium plumosum.*

Figure 22. The mobile dune field below the desired location of the proposed dwelling.

Figure 23. Marram grass (*Ammophila arenaria*) – an exotic species introduced to control sand movement.

8. Proposed Site Development

8.1 Sample Sites

The waypoints shown in Figures 4a, 4b & 5 were those recorded at the corner poles of the site options (excluding the Option 1 site that is shown as a pink dot). Notes made at these points are as follows:

Option 1 Site (retrospective waypoint S 34º 18' 0" E 21º 55' 0")

The site is in a shallow depression at the transition between the more active dunes and the more stabilized dunes. The vegetation consists of Marram grass (*Ammophila arenaria*), *Seriphium plumosum*, *Searsia crenata* and alien *Acacia cyclops* (rooikrans) (Figures 24 & 25)

Figure 24. The Option 1 site, with Marram grass stabilizing the dune and thicket vegetation beginning to establish.

Figure 25. The Option 1 site with Marram grass and Seriphium plumosum (grey shrub) prominent.

FRM0001: S 34º 18' 14.0" E 21º 55' 20.11"

This waypoint is at the most westerly pole for Option 2 (Figure 26). It is in a slight depression with vegetated dunes around it. Species recorded here were *A. arenaria, Lessertia canescens* and *Senecio elegans*. Very low plant diversity; mostly open sand.

Figure 26. The most westerly marker pole with sparse dune vegetation.

FRM0002: S 34º 18' 14.66" E 21º 55' 20.67"

This location is at the second marker pole that is closer to the sea (Figures 27 & 28). The same vegetation was found as at Waypoint FRM0001 but with the addition of *Arctotheca populifolia*.

Figure 27. The marker pole at waypoint FRM0002. It is at lower elevation and more southerly on the dunes.

Figure 28. The marker pole at waypoint FRM0002 as seen from below looking northwards.

FRM0003: S 34º 18' 14.22" E 21º 55' 21.89"

At the lower southeast pole. The same foredune vegetation as described above occurs here (Figures 29 & 30).

Figure 29. The lower southeast pole with typical barrier dune vegetation, looking upslope.

Figure 30. Looking southwards and downslope from waypoint FRM0003. The grey shrub is *Lessertia canescens* (cancer bush).

FRM0004: S 34º 18' 13.41" E 21º 55' 21.19"

This waypoint FRM0004 was located on a raised hummock with Marram grass and *Lessertia canescens* the only species present (Figure 31). The dune below the pole to the south is sparsely vegetated with *Lessertia canescens* (Figure 32).

Figure 31. The pole at waypoint FRM0004, with Marram grass and *Lessertia canescens*.

Figure 32. The view downslope from waypoint FRM0004. It is assumed that this would be the most desirable dwelling construction site.

FRM0005: S 34º 18' 13.11" E 21º 55' 21.10"

The marker pole was on a hummock amongst Marram grass and had a red ribbon tied to it (Figure 33). This location is on the dune ridge, but it slopes steeply to the east. *Seriphium plumosum* is found on the ridge and on the steep dune slope (Figures 34 & 35). *Acacia cyclops* occurs on the east side of the dune amongst thicket vegetation (Figures 35 & 36).

Figure 33. Marram grass around the marker pole at waypoint FRM0005, on the top of the ridge.

Figure 34. *Seriphium plumosum* growing on the steep slope dropping away to the east. This would be the least desirable location for a dwelling.

Figure 35. The steep, east-facing slope in the Option 3 site vicinity. This is not desirable for the proposed dwelling.

Figure 36. Cleared *Acacia cyclops* branches on the steep east-facing dune-slope. A 'tongue' of Hartenbos Dune Thicket is found at the base of the dune.

FRM0006: S 34º 18' 12.73" E 21º 55' 20.83"

This waypoint was recorded at the pole located furthest to the 'back (landward) on the east side. This area has the same vegetation as described above but is more sheltered from the wind. However, it has limited view of the sea (Figures 37 & 38).

Figure 37. The marker pole furthest from the sea on the east side.

Figure 38. A depression behind the high barrier dune. This location has no sea view.

FRM0007: S 34º 18' 12.95" E 21º 55' 19.61"

This marker pole (Option 3) is in a depression landward of the littoral active zone (Figures 39 & 40). It appears to be more sheltered but could be a sand accumulation zone. It has the same foredune vegetation with a few additional species such as *Chironia baccifera* and *Osteospermum moniliferum* indicating that this area is transitional to Hartenbos Dune Thicket. One has no view of the sea from this location.

Figure 39. The marker pole at waypoint FRM0007 is located in a depression behind the high barrier dune.

Figure 40. Second marker pole of Option 3.

FRM0008: S 34º 18' 12.99" E 21º 55' 18.87"

This is the point where the access road reaches the area considered for the dwelling. It is at the interface between the vegetation of the foredunes and the Hartenbos Dune Thicket at the north end of the property (Figure 41 & 42). The road has weedy *Ricinus communis* (castor oil bush) present; it should be eradicated soon. There is also evidence of clearing of alien invasive *Acacia cyclops* that has been left *in situ.* These branches now form a lattice for *Cynanchum ellipticum* that is a typical climber found in Hartenbos Dune Thicket (Figure 43).

Figure 41. The location of the 'entrance" to the site.

Figure 42. Stacked branches of cleared alien invasive vegetation. (This material should be chipped rather than stacked.) The site entrance is in the dune slack behind the active dune field

Figure 43. *Cynanchum ellipticum* climbing vigorously in the stacked dead branches of cleared *Acacia cyclops*.

8.2 Discussion of results of the Screening Assessment

The proposed sites for the construction of a dwelling are located on the 'barrier dune'. The waypoints for Options 1 & 2 are located on the dune crest whereas Option 3 is in a depression landward of the active littoral zone, where the dune 'breaks away' on a steep slope to the east to a point that is vegetated with alien *Acacia saligna* and *Searsia crenata* (Hartenbos Dune Thicket).

Development Option 1 (preferred) and Option 2 sites are close to one another and consequently have the same vegetation. The vegetation consists of tussocks of Marram grass interspersed with scattered mid-high shrubs of *Seriphium plumosum*, erect mid-high to tall shrubs of *Passerina rigida* and open areas where stands of *Lessertia canescens* are found (Figures 25--30).

There is no difference between the sensitivity of the Option 1 and Option 2 sites and the impact of construction on these sites would be similar i.e., low negative from a botanical perspective. In contrast, Option 3 is in a depression and the barrier dune vegetation grades into Hartenbos Dune Thicket. This site is the least suitable of the three options and is not recommended.

9. Conservation Status

Fransmanshoek is a conservancy and limited use is permitted. The entire area is a Critical Biodiversity Area 1 (CBA1) according to the Western Cape Biodiversity Spatial Plan [WCBSP] (CapeNature, 2017; Pence, 2017; Pool-Stanvliet, 2017). The classification, as shown in Figure 44 is supported since this is generally an ecologically sensitive area; Portion 19 of Farm 257 is more-or-less centrally located in the declared CBA1. The two habitat types present are not listed as threatened ecosystems (Government Gazette, 2011).

The only concern is that the level of infestation by alien invasive trees is very high, particularly in the Hartenbos Dune Thicket and this needs concerted effort by the Fransmanshoek Conservancy to systematically remove the alien plants and return the area to its natural state.

No plant species of conservation concern (threatened Red List species) were recorded during the survey.

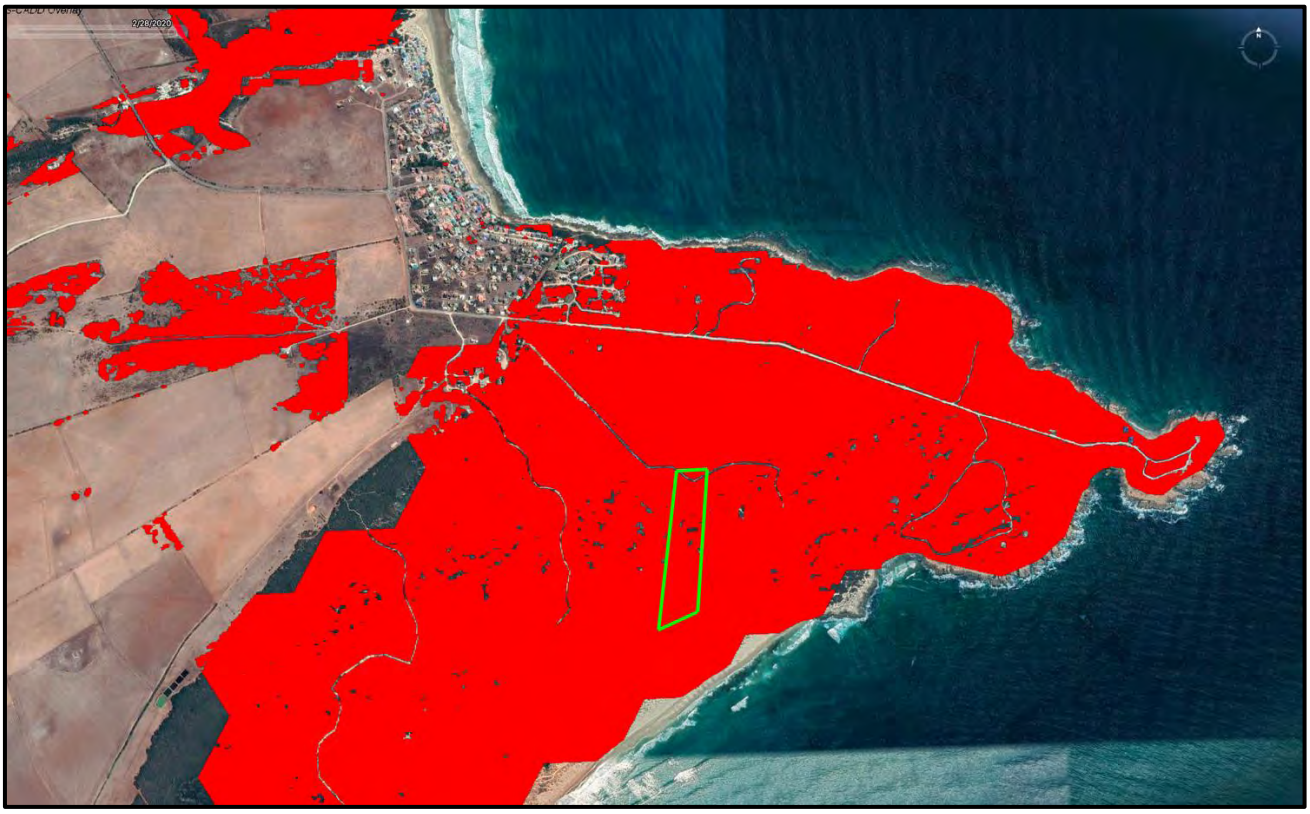


Figure 44. Google Earth ™ aerial image with Critical Biodiversity Areas map [WCBSP] with only CBA1 shown (red) and the study area indicated by the green polygon, within the CBA1.

The National Web-based Screening Tool (Government Gazette, 2020; Enviro Insight, 2020) was applied to determine the sensitivity of the site, bearing in mind that it has drawn on the regional biodiversity spatial plan (WCBSP, 2017 – CapeNature 2017) as described above, for its data. Focus was placed on (1) the Plant Species Sensitivity Theme and (2) the Terrestrial Biodiversity Sensitivity Theme. The output for the Plant Species Theme Sensitivity (map) is given in Figure 45 below, together with the list of plant species generated for the specified land parcel. The Plant Species Theme Sensitivity according to the screening tool is **Medium**.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

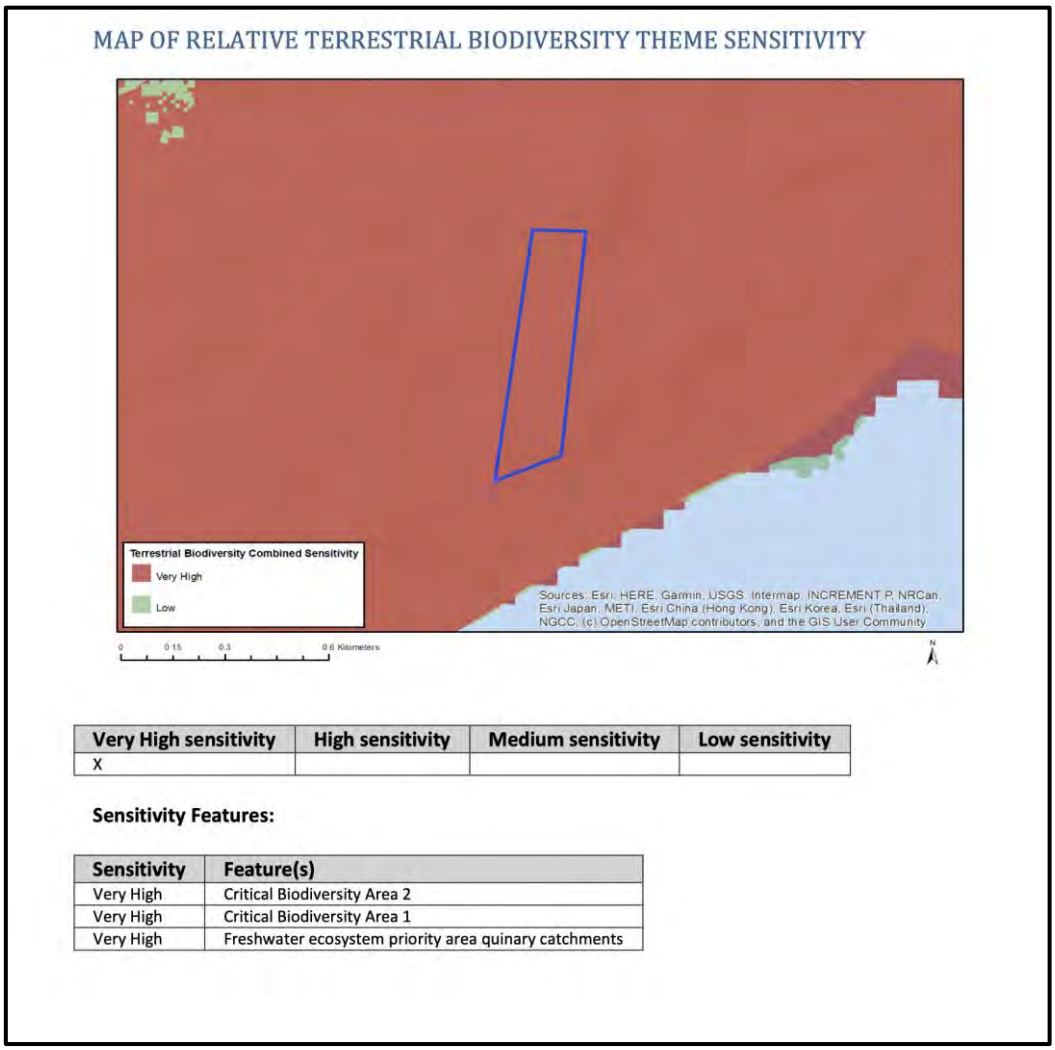
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Sensitive species 466
Medium	Ruschia leptocalyx
Medium	Sensitive species 369
Medium	Thamnochortus muirii
Medium	Duvalia immaculata
Medium	Sensitive species 287
Medium	Argyrolobium harmsianum
Medium	Metalasia luteola
Medium	Cotula myriophylloides
Medium	Athanasia cochlearifolia
Medium	Agathosma muirii
Medium	Agathosma riversdalensis
Medium	Agathosma eriantha
Medium	Euchaetis albertiniana
Medium	Aspalathus obtusifolia
Medium	Aspalathus arenaria
Medium	Lebeckia gracilis
Medium	Leucadendron galpinii
Medium	Leucospermum praecox
Medium	Lampranthus pauciflorus
Medium	Lampranthus ceriseus
Medium	Lampranthus diutinus
Medium	Lampranthus fergusoniae
Medium	Lampranthus foliosus

Figure 45. The output of the National Web-based Environmental Screening Tool for the plant species theme sensitivity, indicating that the site has **Medium** sensitivity.

The output for the Terrestrial Biodiversity Theme Sensitivity (map) is given in Figure 46 below. The terrestrial biodiversity sensitivity is, according to the screening tool, **Very High,** based on the presence of Critical Biodiversity Areas and a Freshwater Ecosystem Priority Area.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Critical Biodiversity Area 2
Very High	Critical Biodiversity Area 1
Very High	Freshwater ecosystem priority area quinary catchments

Figure 46. The output of the National Web-based Environmental Screening Tool for the terrestrial biodiversity theme sensitivity, indicating that the site has **Very High** sensitivity.

In essence, the screening tool provides no more useful information than that obtained from the WCBSP 2017, except that it gives a list of sensitive species for the Plant Species Theme Sensitivity. However, none of the listed species occur in the area where the proposed development would occur, so in that sense it may be concluded that the site itself is not sensitive with respect to plant species. That conclusion was previously reached without the application of the screening tool!

10. Site development layout

Based on the botanical screening assessment and the outcome of other investigations a site development plan has been drawn up as shown in Figure 47. Three alternative sites for the dwelling are proposed (and assessed).

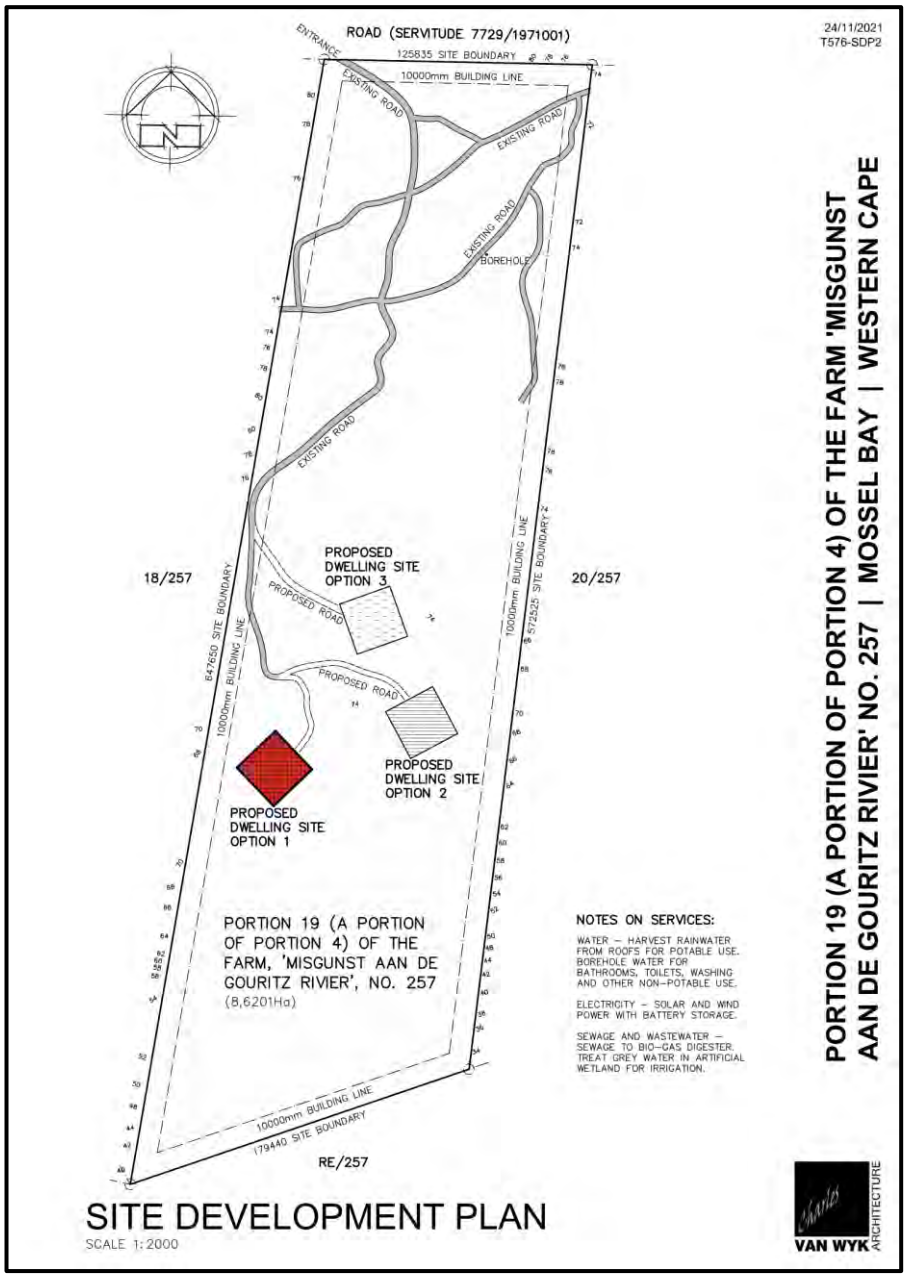


Figure 47. The site development plan (SDP) drawn up based on specialist scoping investigations.

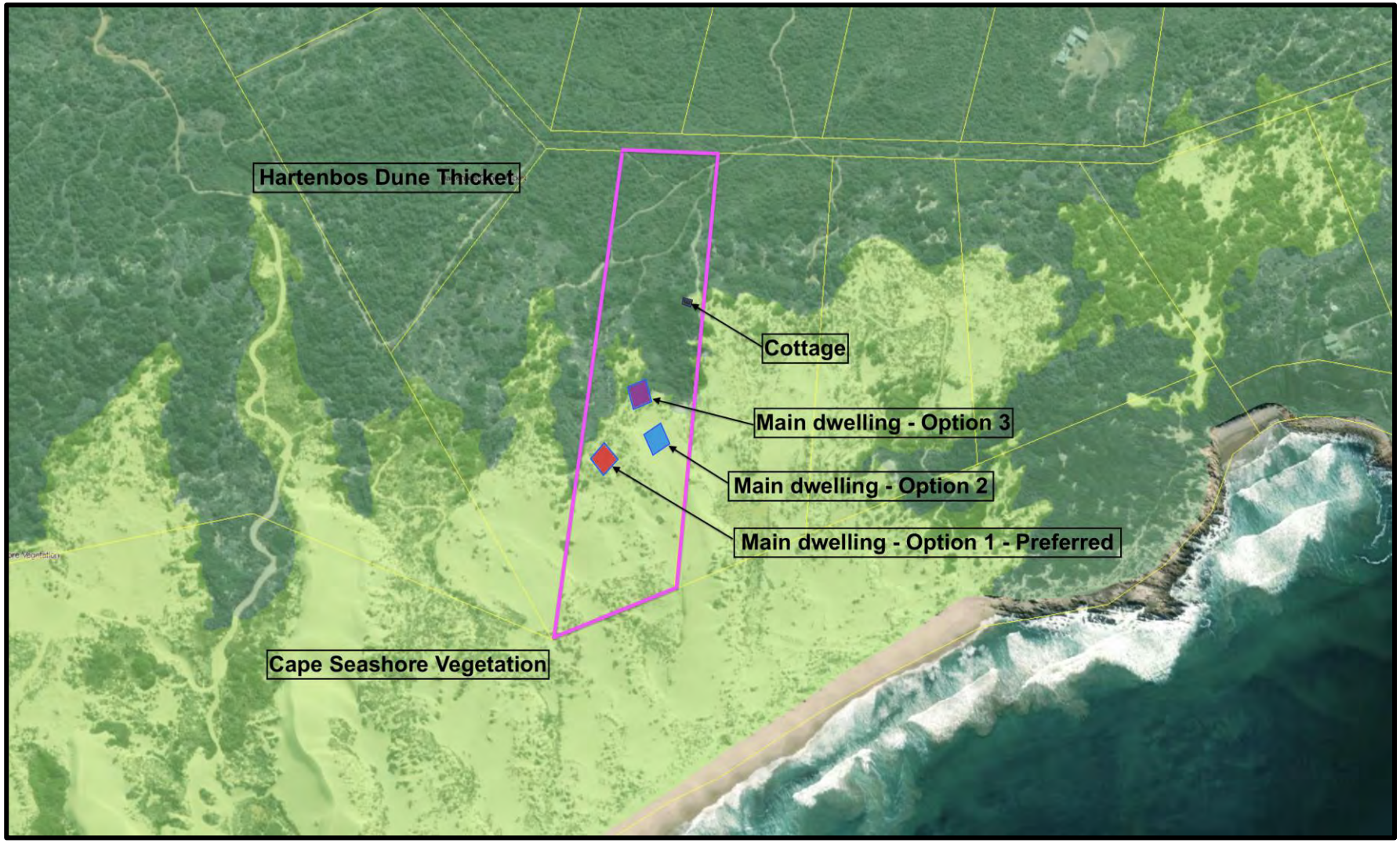


Figure 48. Aerial image (Source: Cape Farm Mapper) with Cape Seashore Vegetation shown in light green and Hartenbos Dune Thicket in dark green (following SANBI 2018 VEGMAP). The farm portion is outlined in pink with the optional footprints labeled and mapped with respect to the vegetation types.

11. Impact Assessment

As described above, the proposal is to build a dwelling on Portion 9 of Farm 257 at a site on the high barrier dunes that provides a sea view. The proposed cottage would not be on the high dunes but behind the main barrier dunes at a point where Cape Seashore Vegetation makes a 'tongue' into the Hartenbos Dune Thicket (Figure 48). The impact of the three main dwelling footprint options, the cottage footprint and the 'No Go' alternative are assessed.

11.1 The 'No Go' scenario

In the case of the 'No Go' scenario, neither the proposed main dwelling nor the cottage would be constructed. The coastal environment at Portion 9 of Farm 257 would thus not be affected any more than it is at present, except if a vigorous alien invasive removal programme were to be instituted. If this happened, it would have a net positive outcome. The access roads would remain as a two-spoor tracks if the dwelling and cottage are not built. The access roads are also considered in the assessment.

11.2 Direct Impacts

Direct impacts are those impacts that would be caused specifically by the envisaged main dwelling and its access road as well as the cottage and its access road. Three impact assessment tables are presented; Table 1 is applicable to the access roads (including that to the cottage), Table 2 is applicable to the three footprint alternatives (options) for the main dwelling and Table 3 is for the single footprint proposed for the cottage.

11.2.1 Impact of the access roads

The access roads are currently sandy two-spoor tracks that wind through the 'inland' dunes from the Fransmanshoek Main Road (OP4980) to the property. The two-spoor roads would have to be formalized in some way and that would have an impact on the sandy soil but only limited impact on the Hartenbos Dune Thicket. Minimal further removal of thicket vegetation is envisaged, so the resulting impact would be **Low Negative** without mitigation. If the recommended mitigation of removal of woody alien trees and the removal of stacked, dead and dry branches of cleared alien trees is implemented, the impact of the roads would be **Very Low Negative** (Table 1). The proposed new road section to the main dwelling (see Figure 45) would traverse deep sand with minimal vegetation. The impact would be **Very Low Ne**gative.

Table 1. Impact and Significance of the access roads on Hartenbos Dune Thicket at Fransmanshoek Conservancy to gain access to Portion 19 of Farm 257, Mossel Bay.

CRITERIA	'NO GO' ALTERNATIVE	Upgrade of the existing two-spoor sandy tracks to the dwelling and cottage and construction of short new section of road to the dwelling	
Nature of direct impact (local scale)	**Loss of Hartenbos Dune Thicket**		
		WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local
Duration	Long-term	Long-term	Long-term
Intensity	Low	Low	Very Low
Probability of occurrence	High	High	High
Confidence	High	High	High
Significance	Low Negative	Low Negative	Very Low Negative
Nature of Cumulative impact	**Loss of Hartenbos Dune Thicket**		
Cumulative impact prior to mitigation	N/A	Low negative	Very Low Negative
Degree to which impact can be reversed	Impact would not be reversed since this is the only access to the site		
Degree to which impact may cause irreplaceable loss of resources	Low to Very low		
Degree to which impact can be mitigated	Medium		
Proposed mitigation	Formalization and stabilization of the sandy road using imported hard material or grass blocks		
Cumulative impact post mitigation	Low Negative		
Significance of cumulative impact (broad scale) after mitigation	Low Negative		

11.2.2 Impact of the proposed dwelling

The proposed dwelling (whichever option is chosen) and surrounding 'garden' would have a **Low Negative** impact at any one of the three alternative sites considered. The sites are all in the same barrier dune zone and the position is determined not by the vegetation but by the desire of the landowner / property developer to have a sea view. The vegetation at all the sites is as described above; a grass-shrub mix with low plant diversity and low botanical and terrestrial biodiversity sensitivity. The grass species is exotic Marram grass, and the shrubs are common. On balance, the preferred site (Option 1) and the Option 2 site would be acceptable, but the Option 3 site is not recommended due to its topography and its position in the ecotone between the barrier dune (foredune) and the Hartenbos Dune Thicket on the dunes located further inland (Table 2).

Table 2. Impact and Significance – on barrier dune vegetation and ecotonal vegetation at Portion 19 of Farm 257, Mossel Bay, of the proposed main dwelling.

CRITERIA	**'NO GO' ALTERNATIVE**	**Construction of a dwelling on the barrier dune at Portion 19 of Farm 257, Mossel Bay**					
Nature of direct impact (local scale)		**Loss of a limited amount of foredune (barrier dune) vegetation of low sensitivity**					
		Option 1 (preferred)		**Option 2**		**Option 3**	
		WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local	Local	Local	Local	Local
Duration	Long-term	Long-term	Long-term	Long-term	Long-term	Long-term	Long-term
Intensity	Low	Low	Low	Low			
Probability of occurrence	Low	High	High	Medium	Medium	Low	Low
Confidence	High	High	High	High	High	High	High
Significance	Low Negative	Low Negative	Very Low Negative	Low Negative	Very Low Negative	Medium Negative	Low Negative
Nature of Cumulative impact	**Loss of vegetation on the barrier dune**						
Cumulative impact prior to mitigation	N/A	Low Negative	Low Negative	Low Negative	Low Negative	Medium Negative	Low Negative
Degree to which impact can be reversed	N/A	Not reversible		Not reversible		Not reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	Low to Very low		Low to Very low		Low to Very low	
Degree to which impact	N/A	Medium		Medium		Medium	

can be mitigated				
Proposed mitigation	None	Planting of locally indigenous shrubs and herbaceous plants to soften the visual impact and limit movement of sand.	Planting of locally indigenous shrubs and herbaceous plants to soften the visual impact and limit movement of sand.	Removal of all woody alien plants
Cumulative impact post mitigation	None	Very Low Negative	Very Low Negative	Medium negative
Significance of cumulative impact (broad scale) after mitigation	None	Very Low Negative	Very Low Negative	Medium negative

11.3 Indirect Impacts

No indirect negative impacts of the proposed development of a dwelling were identified.

11.4 Mitigation

The receiving environment of the proposed development of the main dwelling is very harsh due to its proximity to the sea and exposed position on a high dune. The only mitigation that can be suggested is the planting of locally indigenous shrubs e.g. *Searsia species*, in particular *Searsia crenata* that are tolerant of the harsh conditions. Such plants would also soften the visual impact of a house in a prominent position on a high dune. In the case of the cottage, it would be somewhat more protected, both by the location and by the surrounding thicket. No exotic species should be introduced into the 'garden' of the cottage, but local species of shrubs, small trees and annuals should be encouraged. In the case of the cottage a higher fire risk exists than for the main dwelling. Tall, flammable vegetation should be kept trimmed back at least 10 m surrounding the cottage to protect it in the event of a fire.

11.5 Cumulative Impacts

The habitat and environment into which the dwelling would be imposed is not highly sensitive nor threatened and the likelihood of numerous other similar dwellings being constructed in this area are low. There would be limited loss of natural habitat overall so cumulative impacts would be negligible.

12. Conclusions and Recommendations

The proposed dwelling would be constructed at a site on Portion 19 of Farm 257, Mossel Bay, where the vegetation is made partly of alien Marram grass and partly of scattered indigenous species, notably *Seriphium plumosum*, *Passerina rigida* and *Lessertia canescens*. The entire area of the Fransmanshoek Peninsula is declared a CBA1 zone, but the proposed dwelling would have a **low to very low impact** on the existing habitat and would be in keeping with the conservation objectives of the Fransmanshoek Conservancy.

It is recommended that the dwelling should be built at the preferred site (Option 1) or Option 2 whereas the Option 3 site would not be desirable. The anticipated impact after mitigation would be **Very Low Negative** for both Options 1 and 2.

The access roads will present challenges and a suitable substrate should be imported to make the road passable during all seasons. Although the anticipated impacts of upgrading the access roads would only have a limited further negative impact on the vegetation, no further recommendation is made since this is beyond the scope of this investigation.

Ongoing efforts must take place to remove alien species, notably *Ricinus communis* (castor oil), *Acacia cyclops* (rooikrans) and Manatoka (*Myoporum spp.*).

Owing to the highly dynamic zone (wind with active movement of sand) the establishment of plants as a 'garden' around the dwelling would be challenging. It is strongly recommended that species found locally in the Hartenbos Dune Thicket should be used for any plantings of shrubs and trees. One of the most effective would be *Searsia* species (*Searsia lucida* and *Searsia crenata*). It would be feasible to attempt to establish some form of lawn using indigenous buffalo grass (*Stenotaphrum secundatum*) but how successful this would be is unknown.

The very low plant species diversity and isolation of the proposed development site mean that the direct and cumulative impacts would not be on a scale that would change the ambience of the environment and no sensitive plant species, or habitat would be lost.

The proposed construction of a dwelling at either of the sites Option 1 or Option 2 is supported from a botanical and terrestrial biodiversity perspective.

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Report submitted: 25 September 2020; amended 28 October 2021 and 7 March 2022

Appendix 1: Impact Assessment Methodology

Method of Assessing Impact Significance

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, *inter alia*: the purpose and need for the project; views and concerns of interested and affected parties (I&APs); social and political norms, and general public interest.

Identification and Description of Impacts

Identified impacts are described in terms of the nature of the impact, compliance with legislation and accepted standards, receptor sensitivity and the significance of the predicted environmental change (before and after mitigation). Mitigation measures may be existing measures or additional measures that were identified through the impact assessment and associated specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of mitigation.

Evaluation of Impacts and Mitigation Measures

Introduction

Impacts are assessed using SLR's standard convention for assessing the significance of impacts, a summary of which is provided below.
In assigning significance ratings to potential impacts before and after mitigation the approach presented below is to be followed.

1. **Determine the impact consequence rating:** This is a function of the "intensity", "duration" and "extent" of the impact (see Section 0). The consequence ratings for combinations of these three criteria are given in Section 0.

2. **Determine impact significance rating:** The significance of an impact is a function of the consequence of the impact occurring and the probability of occurrence (see Section 0). Significance is determined using the table in Section 0.

3. **Modify significance rating (if necessary):** Significance ratings are based on largely professional judgement and transparent defined criteria. In some instances, therefore, whilst the significance rating of potential impacts might be "low", the importance of these impacts to local communities or individuals might be extremely high. The importance/value which interested and affected parties attach to impacts will be highlighted, and recommendations should be made as to ways of avoiding or

minimising these perceived negative impacts through project design, selection of appropriate alternatives and / or management.

4. **Determine degree of confidence of the significance assessment:** Once the significance of the impact has been determined, the degree of confidence in the assessment will be qualified (see Section 0). Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact.

Criteria for Impact Assessment

The criteria for impact assessment are provided below.

Criteria	Rating	Description
Criteria for ranking of the INTENSITY (SEVERITY) of environmental impacts	**ZERO TO VERY LOW**	Negligible change, disturbance or nuisance. The impact affects the environment in such a way that natural functions and processes are not affected. People / communities are able to adapt with relative ease and maintain pre-impact livelihoods.
	LOW	Minor (Slight) change, disturbance or nuisance. The impact on the environment is not detectable or there is no perceptible change to people's livelihood.
	MEDIUM	Moderate change, disturbance or discomfort. Where the affected environment is altered, but natural functions and processes continue, albeit in a modified way. People/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.
	HIGH	Prominent change, disturbance or degradation. Where natural functions or processes are altered to the extent that they will temporarily or permanently cease. Affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.
Criteria for ranking the DURATION of impacts	**SHORT TERM**	< 5 years.
	MEDIUM TERM	5 to < 15 years.
	LONG TERM	> 15 years, but where the impact will eventually cease either because of natural processes or by human intervention.
	PERMANENT	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.
Criteria for ranking the EXTENT / SPATIAL SCALE of impacts	**LOCAL**	Impact is confined to project or study area or part thereof, e.g. limited to the area of interest and its immediate surroundings.
	REGIONAL	Impact is confined to the region, e.g. coast, basin, catchment, municipal region, etc.
	NATIONAL	Impact is confined to the country as a whole, e.g. South Africa, etc.
	INTERNATIONAL	Impact extends beyond the national scale.
Criteria for determining the PROBABILITY of impacts	**IMPROBABLE**	Where the possibility of the impact to materialise is very low either because of design or historic experience, i.e. ≤ 30% chance of occurring.
	POSSIBLE	Where there is a distinct possibility that the impact would occur, i.e. > 30 to ≤ 60% chance of occurring.

Criteria	Rating	Description
	PROBABLE	Where it is most likely that the impact would occur, i.e. > 60 to ≤ 80% chance of occurring.
	DEFINITE	Where the impact would occur regardless of any prevention measures, i.e. > 80% chance of occurring.
Criteria for determining the DEGREE OF CONFIDENCE of the assessment	**LOW**	≤ 35% sure of impact prediction.
	MEDIUM	> 35% and ≤ 70% sure of impact prediction.
	HIGH	> 70% sure of impact prediction.
Criteria for the DEGREE TO WHICH IMPACT CAN BE MITIGATED - the degree to which an impact can be reduced / enhanced	**NONE**	No change in impact after mitigation.
	VERY LOW	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
	LOW	Where the significance rating drops by one level, after mitigation.
	MEDIUM	Where the significance rating drops by two to three levels, after mitigation.
	HIGH	Where the significance rating drops by more than three levels, after mitigation.
Criteria for LOSS OF RESOURCES - the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable	**LOW**	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
	MEDIUM	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
	HIGH	Where the activity results in an irreplaceable loss of a resource.

Determining Consequence

Consequence attempts to evaluate the importance of a particular impact, and in doing so incorporates extent, duration and intensity. The ratings and description for determining consequence are provided below.

Rating	Description
VERY HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***long term***; OR of ***high intensity*** at a ***national level*** in the ***medium term***; OR of ***medium intensity*** at a ***national level*** in the ***long term.***
HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***high intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***medium term;*** OR of ***low intensity*** at a ***national level*** in the ***long term***; OR of ***high intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***regional level*** in the ***long term.***
MEDIUM	Impacts could be EITHER: of ***high intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***medium intensity*** at a ***regional level*** in the ***medium term***; OR of ***high intensity*** at a ***regional level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***local level*** in the ***long term***; OR of ***low intensity*** at a ***national level*** in the ***medium term;***

Rating	Description
	OR of ***low intensity*** at a ***regional level*** in the ***long term.***
LOW	Impacts could be EITHER of ***low intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***national level*** in the ***short term***; OR of ***high intensity*** at a ***local level*** and endure in the ***short term***; OR of ***medium intensity*** at a ***regional level*** in the ***short term***; OR of ***low intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***local level*** and endure in the ***medium term.***
VERY LOW	Impacts could be EITHER of ***low intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***regional level*** and endure in the ***short term***; OR of ***low to medium intensity*** at a ***local level*** and endure in the ***short term.*** OR **Zero to very low intensity** with any combination of extent and duration.

Determining Significance

The consequence rating is considered together with the probability of occurrence in order to determine the overall significance using the table below.

		PROBABILITY			
		IMPROBABLE	**POSSIBLE**	**PROBABLE**	**DEFINITE**
CONSEQUENCE	**VERY LOW**	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	LOW	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	MEDIUM	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	HIGH	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	VERY HIGH	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

In certain cases it may not be possible to determine the significance of an impact. In these instances the significance is **UNKNOWN**.

Appendix 2: Minimum Content Requirements for Terrestrial Biodiversity Specialist Reports as per Protocol for the Specialist Assessment of Environmental Impacts on Terrestrial Biodiversity (GN 320 of 20 March 2020)

Protocol ref	**Terrestrial Biodiversity Specialist Assessment Report Content**	**Section / Page**
3.1.1.	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page 2
3.1.2.	a signed statement of independence by the specialist;	Page 4
3.1.3.	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Page 10
3.1.4.	a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Page 10
3.1.5.	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Page 10
3.1.6.	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	N/A
3.1.7.	additional environmental impacts expected from the proposed development;	N/A
3.1.8.	any direct, indirect and cumulative impacts of the proposed development;	Pages 37—43
3.1.9.	the degree to which impacts and risks can be mitigated;	Pages 42
3.1.10.	the degree to which the impacts and risks can be reversed;	Pages 37--43
3.1.11.	the degree to which the impacts and risks can cause loss of irreplaceable resources;	Pages 37--43
3.1.12.	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Pages 42--43
3.1.13.	a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	Page 42
3.1.14.	a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Pages 42, 43
3.1.15.	any conditions to which this statement is subjected.	N/A

Appendix 3: Curriculum Vitae

Dr David Jury McDonald Pr. Sci. Nat.

Name of Company: Bergwind Botanical Surveys & Tours CC. (Independent consultant)

Work and Home Address: 14 A Thomson Road, Claremont, 7708

Tel: (021) 671-4056 **Mobile:** 082-876-4051 **Fax:** 086-517-3806

E-mail: dave@bergwind.co.za

Website: www.bergwind.co.za

Profession: Botanist / Vegetation Ecologist / Consultant / Tour Guide

Date of Birth: 7 August 1956

Employment history:

- 19 years with National Botanical Institute (now SA National Biodiversity Institute) as researcher in vegetation ecology.
- Five years as Deputy Director / Director Botanical & Communication Programmes of the Botanical Society of South Africa
- Fifteen years as private independent Botanical Specialist consultant (Bergwind Botanical Surveys & Tours CC)

Nationality: South African (ID No. 560807 5018 080)
Languages: English (home language) – speak, read and write
Afrikaans – speak, read and write

Membership in Professional Societies:

- International Association for Impact Assessment (SA)
- South African Council for Natural Scientific Professions (**Ecological Science, Registration No. 400094/06**)
- Field Guides Association of Southern Africa

Key Qualifications:

- Qualified with a M. Sc. (1983) in Botany and a PhD in Botany (Vegetation Ecology) (1995) at the University of Cape Town.
- Research in Cape fynbos ecosystems and more specifically mountain ecosystems.
- From 1995 to 2000 managed the Vegetation Map of South Africa Project (National Botanical Institute).
- Conducted botanical survey work for AfriDev Consultants for the Mohale and Katse Dam projects in Lesotho from 1995 to 2002. A large component of this work was the analysis of data collected by teams of botanists.
- **Director: Botanical & Communication Programmes** of the Botanical Society of South Africa (2000—2005), responsible for communications and publications; involved with

conservation advocacy particularly with respect to impacts of development on centres of plant endemism.

- Further tasks involved the day-to-day management of a large non-profit environmental organisation.
- **Independent botanical consultant** (2005 – to present) over 300 projects have been completed related to environmental impact assessments in the Western, Southern and Northern Cape, Karoo and Lesotho. A list of reports (or selected reports for scrutiny) is available on request.

Higher Education

Degrees obtained
and major subjects passed:

B.Sc. (1977), University of Natal, Pietermaritzburg
Botany III
Entomology II (Third year course)

B.Sc. Hons. (1978) University of Natal, Pietermaritzburg
Botany (Ecology /Physiology)

M.Sc. - (Botany), University of Cape Town, 1983.
Thesis title: 'The vegetation of Swartboschkloof, Jonkershoek, Cape Province'.

PhD (Botany), University of Cape Town, 1995.
Thesis title: 'Phytogeography endemism and diversity of the fynbos of the southern Langeberg'.

Certificate of Tourism: Guiding (Culture: Local)
Level: 4 Code: TGC7 (Registered Tour Guide: WC 2969).

Employment Record:

January 2006 – present: Independent specialist botanical consultant and tour guide in own company: **Bergwind Botanical Surveys & Tours CC**
August 2000 - 2005 : Deputy Director, later Director Botanical & Communication Programmes, Botanical Society of South Africa
January 1981 – July 2000 : Research Scientist (Vegetation Ecology) at National Botanical Institute
January 1979—Dec 1980 : National Military Service

Further information is available on my company website: www.bergwind.co.za