Terrestrial Biodiversity Assessment

prepared in accordance with the
"Protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on Terrestrial Biodiversity"

Erf 220/209 Aalwyndal in Mossel Bay in the Western Cape Province

David Hoare Consulting (Pty) Ltd

Terrestrial Biodiversity Assessment Report for Erf 220/209 Aalwyndal in Mossel Bay in the Western Cape Province

David Hoare
Consulting (Pty) Ltd

Address:
Postnet Suite #116
Private Bag X025
Lynnwood Ridge
0040

41 Soetdoring Avenue
Lynnwood Manor
Pretoria

Cell: 083 284 5111
david@davidhoareconsulting.co.za

13 November 2023

TABLE OF CONTENTS

SPECIALIST DETAILS & DECLARATION

This report has been prepared in accordance with the "Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity", as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020. It has been prepared independently of influence or prejudice by any parties.

The details of Specialists are as follows –

Table 1: Details of Specialist

Specialist	Qualification and accreditation
Dr David Hoare (Pr.Sci.Nat.)	• PhD Botany • SACNASP Reg. no. 400221/05 (Ecology, Botany)

Declaration of independence:

David Hoare Consulting (Pty) Ltd in an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by David Hoare Consulting (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

David Hoare Consulting (Pty) Ltd undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to David Hoare Consulting (Pty) Ltd by the client and in addition to information obtained during the course of this study, David Hoare Consulting (Pty) Ltd present the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practise.

_____ 13 November 2023

Dr David Hoare Date

TERMS OF REFERENCE

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY

The specialist study is required to follow the published Protocols, provided in full below for the assessment of impacts on Terrestrial Biodiversity, on Animal Species, and on Plant Species. Note that the Protocols require determination of the level of sensitivity, which then determines the level of assessment required, either a full assessment, or a Compliance Statement.

Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Terrestrial Biodiversity

This site sensitivity assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020.

General information

1.1. An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being of "**very high sensitivity**" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment.

1.2. An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being "**low sensitivity**" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Compliance Statement.

1.3. However, where the information gathered from the site sensitivity verification differs from the designation of "very high" terrestrial biodiversity sensitivity on the screening tool and it is found to be of a "low" sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

1.4. Similarly, where the information gathered from the site sensitivity verification differs from that identified as having a "low" terrestrial biodiversity sensitivity on the screening tool, a Terrestrial Biodiversity Specialist Assessment must be conducted.

1.5. If any part of the proposed development footprint falls within an area of "very high" sensitivity, the assessment and reporting requirements prescribed for the "very high" sensitivity apply to the entire footprint, ***excluding linear activities*** *for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase*, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any area that will be disturbed.

Terrestrial Biodiversity Specialist Assessment

2.1. The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.

2.2. The assessment must be undertaken on the preferred site and within the proposed development footprint.

2.3. The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:

2.3.1. a description of the ecological drivers or processes of the system and how the proposed development will impact these;

2.3.2. ecological functioning and ecological processes (e.g. fire, migration, pollination, etc.) that operate within the preferred site;

2.3.3. the ecological corridors that the proposed development would impede including migration and movement of flora and fauna;

2.3.4. the description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub catchments;

2.3.5. a description of terrestrial biodiversity and ecosystems on the preferred site, including:

(a) main vegetation types;
(b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;
(c) ecologicalconnectivity,habitatfragmentation,ecologicalprocesses and fine-scale habitats; and
(d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified;

2.3.6. the assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification; and

2.3.7. the assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:

2.3.7.1. terrestrial critical biodiversity areas (CBAs), including:

(a) the reasons why an area has been identified as a CBA;
(b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;
(c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);
(d) the impact on ecosystem threat status;
(e) the impact on explicit subtypes in the vegetation;
(f) the impact on overall species and ecosystem diversity of the site; and
(g) the impact on any changes to threat status of populations of species of conservation concern in the CBA;

2.3.7.2. terrestrial ecological support areas (ESAs), including:

(a) the impact on the ecological processes that operate within or across the site;
(b) the extent the proposed development will impact on the functionality of the ESA; and
(c) loss of ecological connectivity (on site, and in relation to the

broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;

2.3.7.3. protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including-

(a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;

2.3.7.4. priority areas for protected area expansion, including-

(a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;

2.3.7.5. SWSAsincluding:

(a) the impact(s) on the terrestrial habitat of a SWSA; and

(b) the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);

2.3.7.6. FEPAsubcatchments,including-

(a) theimpactsoftheproposeddevelopmentonhabitatconditionand species in the FEPA sub catchment;

2.3.7.7 indigenous forests, including:

(a) impact on the ecological integrity of the forest; and

(b) percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.

2.4. The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.

Terrestrial Biodiversity Specialist Assessment Report

3.1. The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:

3.1.1. contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;

3.1.2. a signed statement of independence by the specialist;

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;

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;

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;

3.1.6. a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);

3.1.7. additional environmental impacts expected from the proposed development;

3.1.8. any direct, indirect and cumulative impacts of the proposed development;

3.1.9. the degree to which impacts and risks can be mitigated;

3.1.10. the degree to which the impacts and risks can be reversed;

3.1.11. the degree to which the impacts and risks can cause loss of irreplaceable resources;

3.1.12. proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);

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;

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

3.1.15. any conditions to which this statement is subjected.

3.2.The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.

3.3. A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

INTRODUCTION

Site location

The site, which is Erf 220/209, is within Aalwyndal in Mossel Bay, slightly west (inland) of Diaz Strand. Refer to Figure 1 below for the general location.

The property is one of the rural properties that forms part of Aalwyndal, close to the Mossel Bay Airport. It is accessed from the Hartenbos off-ramp from the N2 National road. The road, Klipheuwel Way, forms the northern and eastern boundaries of the site. A driveway of a neighbouring property forms the western boundary. A property boundary forms the southern boundary.

Valleys that runs from east to west through the existing suburbs of Still Bay. Surrounding areas are mostly similar rural plots consisting mostly of natural vegetation and existing homesteads. The current site has no existing infrastructure and is mostly in a natural state (Figure 2).

The scope of this report is the part of the property that is proposed for development. The entire site is 5.16 ha of which most is proposed for development - an area of 0.95 ha is indicated on the plan as being retained as "natural vegetation".

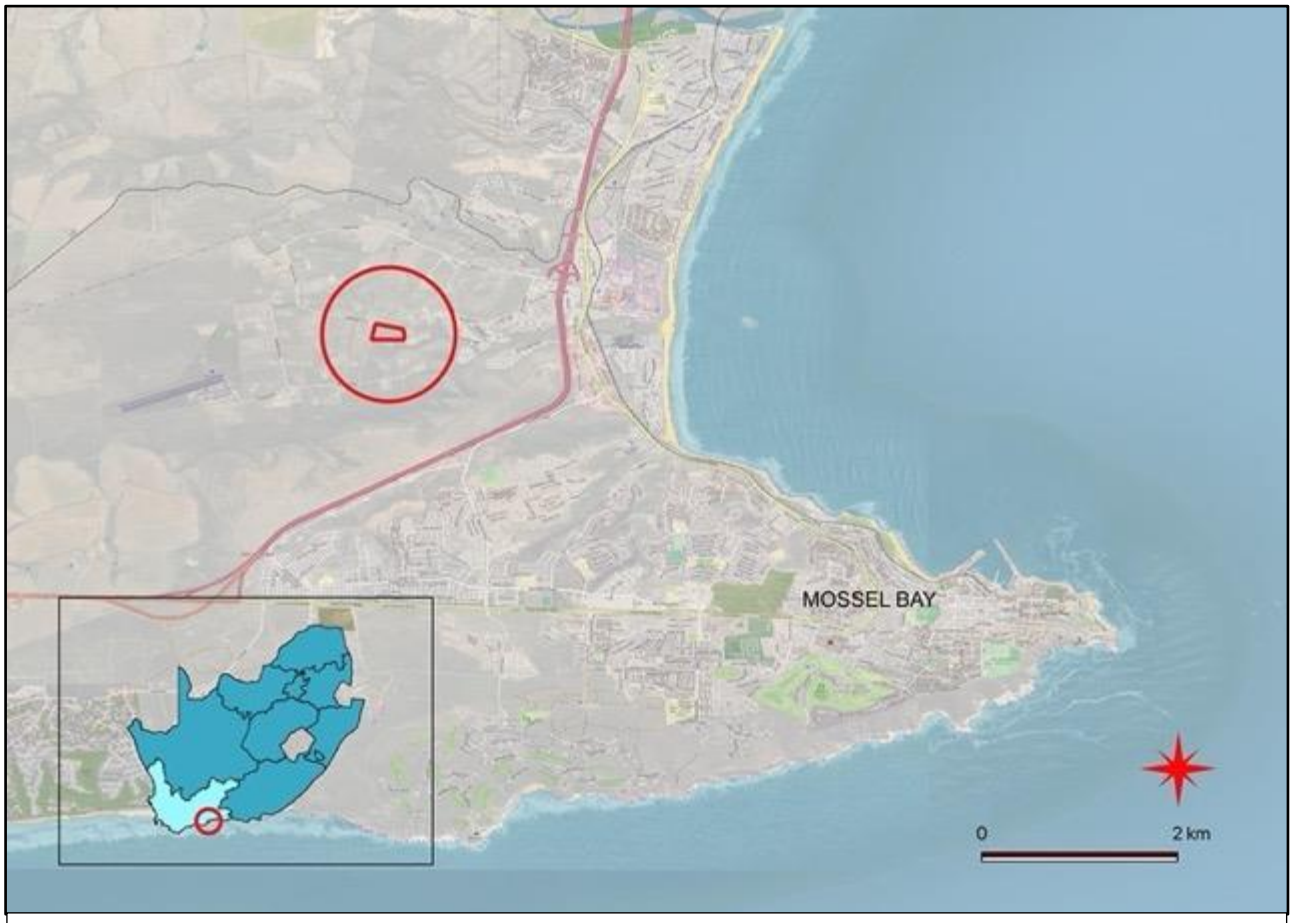

Figure 1: Location of the site.

Figure 2: Aerial image of the site and surrounding areas.

Identified Theme Sensitivities

A sensitivity screening report from the DEA Online Screening Tool was requested in the application category: Transformation of land | Indigenous vegetation. The DEA Screening Tool report for the area, dated 31/07/2023, indicates the following sensitivities (see Figure 3):

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Terrestrial Biodiversity Theme	X			

Terrestrial Biodiversity theme

Sensitivity features are indicates as follows:

Sensitivity	Feature(s)
Very High	ESA 2: Restore from other land use
Very High	ESA 1
Very High	CBA 2: Terrestrial
Very High	CBA 1: Terrestrial
Very High	EN_Hartenbos Dune Thicket

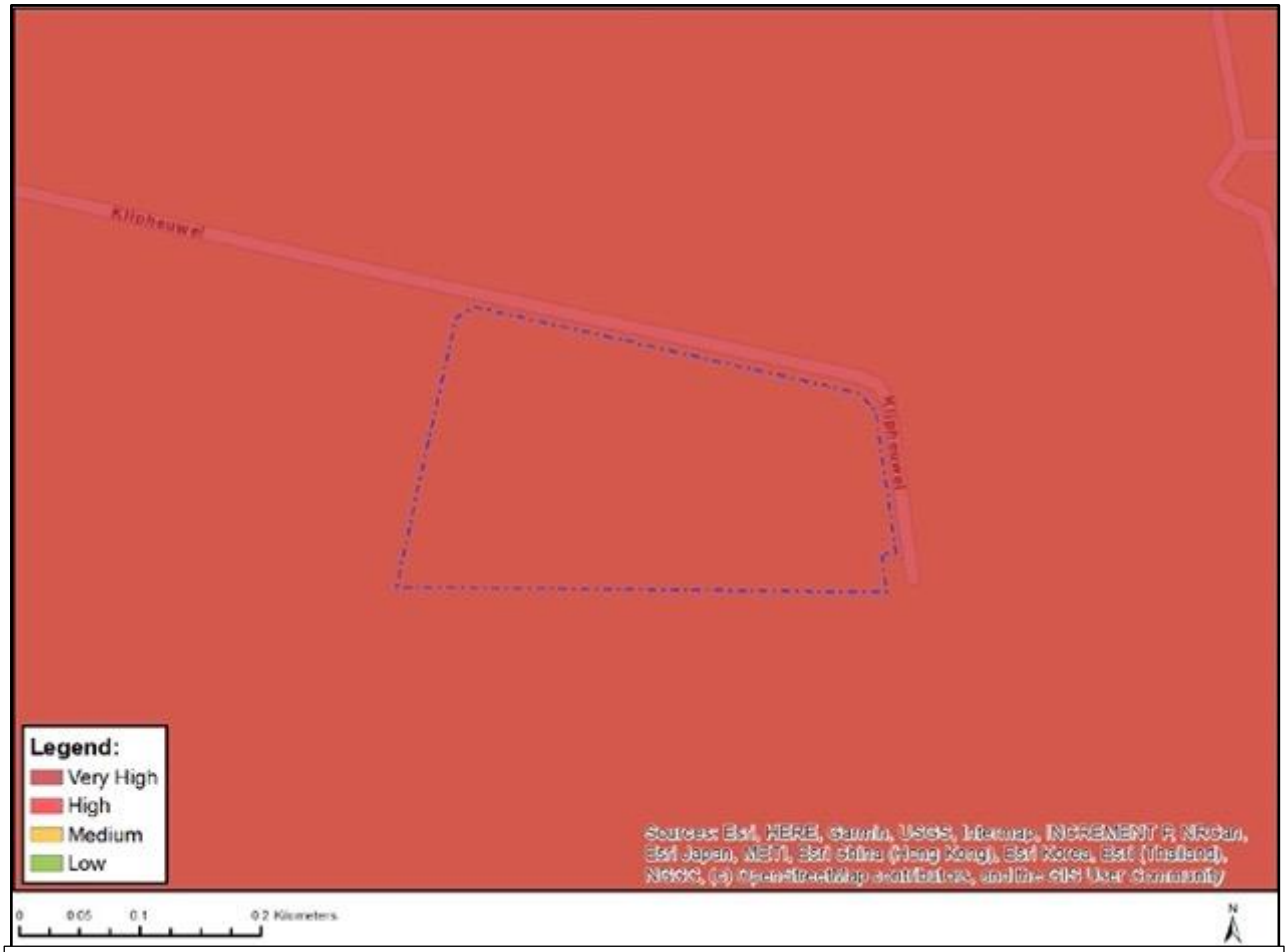

Figure 3: Map of relative terrestrial biodiversity theme sensitivity for the site.

ASSESSMENT METHODOLOGY

The detailed methodology followed as well as the sources of data and information used as part of this assessment is described below.

Project Area of Influence (PAOI)

The proposal is to develop the site for residential purposes. This will include various housing types and a small commercial portion (see Figure 4 for preferred layout and Figure 5 for the original (alternative) layout). Anticipated impacts will mostly occur during the construction phase. These impacts are not expected to extend significantly beyond the boundaries of the study area, except for possible edge effects. The PAOI is therefore treated here as the development footprint within which direct impacts will occur (Figures 4 or 5).

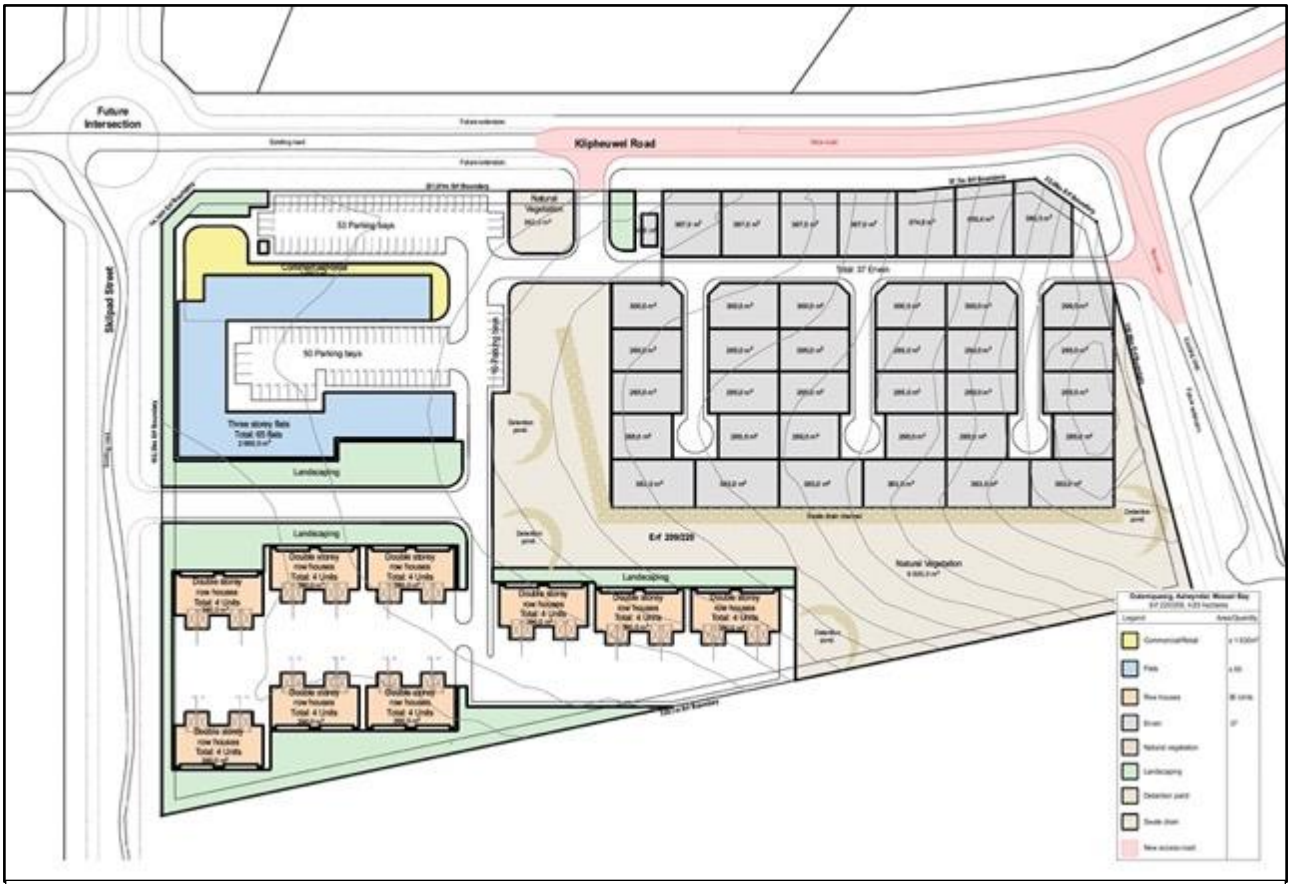

Figure 4: Proposed development on site.

Figure 5: Original (alternative) layout for development on site.

Survey timing

The study commenced as a desktop-study followed by site-specific field study on 26 February 2022 and 25 February 2023. The site is within the Fynbos Biome with an all-year rainfall season with a slight dip in early winter (Figure 6). A more accurate indication of rainfall seasonality, which drives most ecological processes, is shown in Figure 7, which shows that Mossel Bay has peak rainfall from August to November, with another smaller peak in March to April. The timing of the survey in February is therefore suitable in terms of assessing the flora and vegetation of the site. The overall condition of the vegetation was possible to be determined with a high degree of confidence.

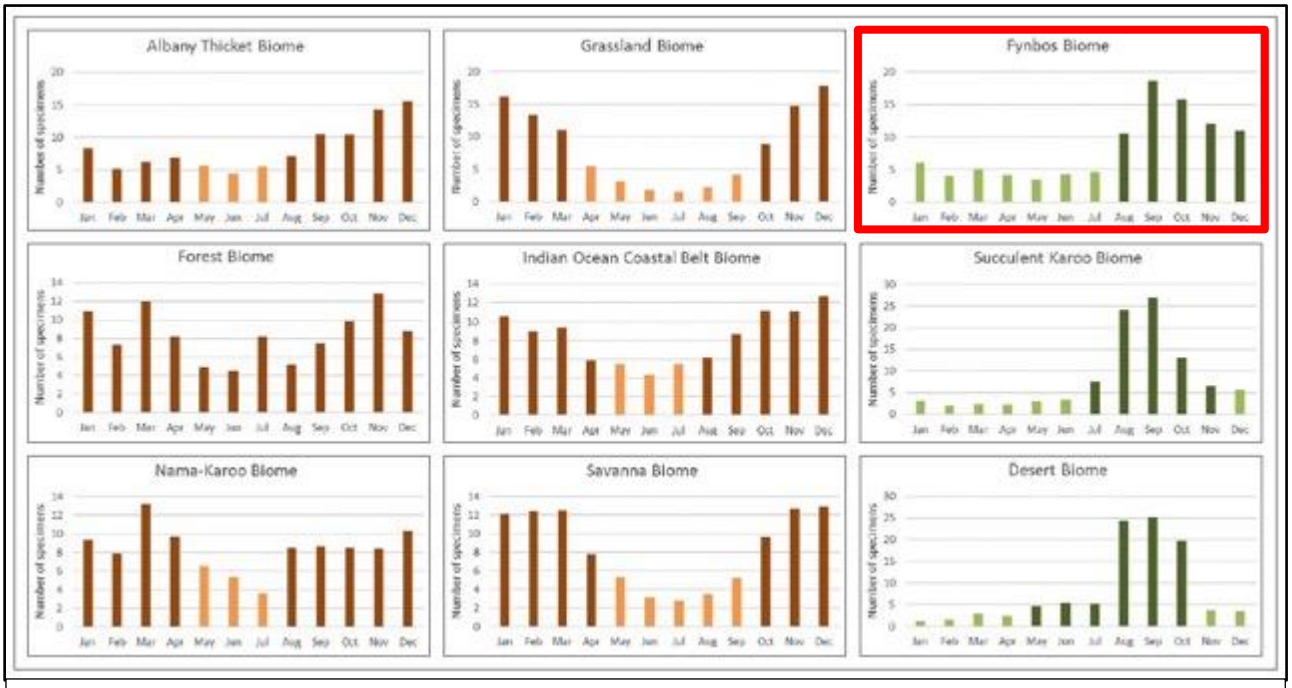

Figure 6: Recommended survey periods for different biomes (Species Environmental Assessment Guidelines). The site is within the Fynbos Biome.

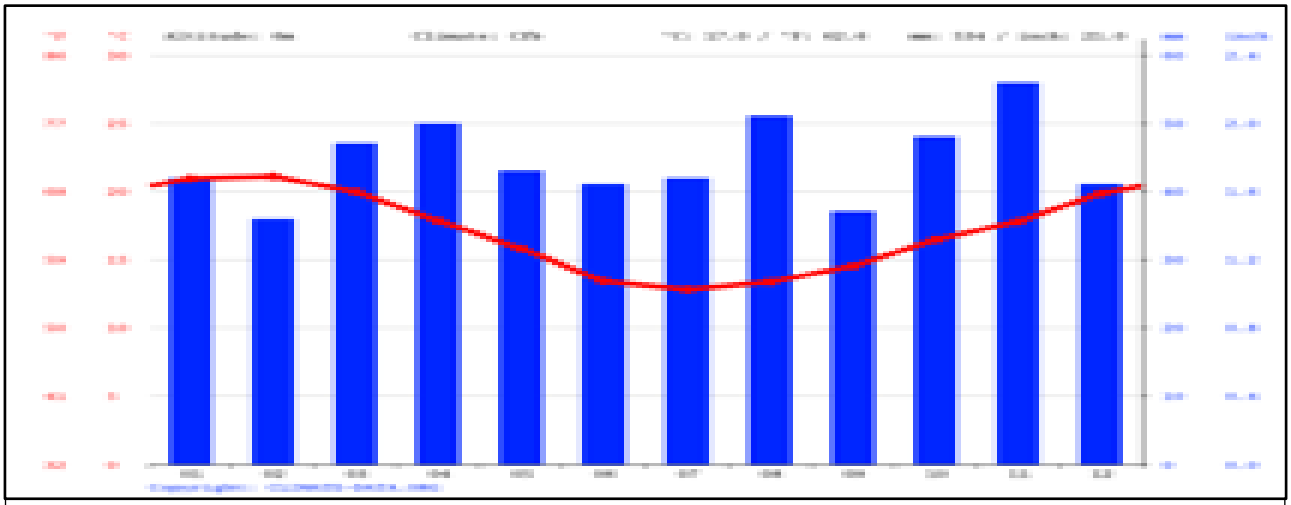

Figure 7: Climate diagram showing average monthly rainfall and temperature for Mossel Bay.

Field survey approach

The study commenced as a desktop-study followed by a site-specific field study. During the field survey of habitats on site, the entire property was assessed on foot. Field surveys included both meander searches of general areas, and active searching in habitats that were considered to be suitable for specific groups or species. Meander surveys were undertaken with no time restrictions - the objective was to comprehensively examine all natural areas. A hand-held Garmin GPSMap 64s was used to record a track within which observations were made (Figure 8). Digital photographs were taken of features and habitats on site, as well as of all plant species that were seen. All plant and animal species recorded were uploaded to the iNaturalist website (https://www.inaturalist.org) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the desired study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

Aerial imagery from Google Earth was used to identify and assess habitats on site. This included historical imagery that may show information not visible in any single dated image. Patterns identified from satellite imagery were verified on the ground. Digital photographs were taken at locations where features of interest were observed. During the field survey, particular attention was paid to ensuring that all habitat variability was covered physically on the ground.

Figure 8: GPS track log of areas walked in the course of undertaking this assessment.

Sources of information

Regional Vegetation

- Broad vegetation types occurring on site were obtained from Mucina and Rutherford (2006), with updates according to the SANBI BGIS website (http://bgis.sanbi.org), as follows:
    - Mucina, L. and Rutherford, M.C. (editors) 2006. Vegetation map of South Africa, Lesotho and Swaziland: an illustrated guide. Strelitzia 19, South African National Biodiversity Institute, Pretoria.
    - South African National Biodiversity Institute 2018 Final Vegetation Map of South Africa, Lesotho and Swaziland [Vector] 2018. Available from the Biodiversity GIS website, downloaded on 23 September 2021.

Threatened Ecosystems

- The conservation status of the vegetation types were obtained from Mucina and Rutherford (2006) and the National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).
- The plant species checklist of species that could potentially occur on site was compiled from a plant species checklist extracted from the NewPosa database of the South African National biodiversity Institute (SANBI) for the quarter degree grids 3422AA.
- The IUCN Red List Category for plant species, as well as supplementary information on habitats and distribution, was obtained from the SANBI Threatened Species Programme (Red List of South African Plants, http://redlist.sanbi.org).

Regional plans

- Information from the National Protected Areas Expansion Strategy (NPAES) was consulted for possible inclusion of the site into a protected area in future (available on http://bgis.sanbi.org).).
- The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) Maps were consulted for inclusion of any parts of the site into any Critical Biodiversity Areas or Ecological Support Areas (CapeNature. 2017 WCBSP Mossel Bay [Vector] 2017. Available from the Biodiversity GIS website (biodiversityadvisor.sanbi.org)).

Limitations

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The assessment is based on two detailed site visits. The time spent on site was adequate for understanding general patterns across affected areas on site, as well as for detecting individuals of any sensitive plants species encountered on site.

Impact assessment methodology

The Impact Assessment Methodology assists in evaluating the overall effect of a proposed activity on the environment. Impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). The rating system is applied to the potential impact on the receptor. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 2: Rating of impact assessment criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).

2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.** The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.

43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

OUTCOME OF THE ASSESSMENT

Regional vegetation patterns

There is one regional vegetation type mapped for the property within which the development is located, namely North Langeberg Sandstone Fynbos. Detailed published descriptions of this regional vegetation type is available online and in printed form and it is not described further here.

North Langeberg Sandstone Fynbos is not listed in the Revised National List of Ecosystems that are Threatened and in need of Protection.

Only North Langeberg Sandstone Fynbos is affected by the proposed development (Figure 9). The national vegetation map is not mapped at a fine scale and the on-site patterns do not necessarily match this description. The local topography includes river valleys that contain thicket vegetation that extends from the river system that exits at Diaz Strand. However, this thicket vegetation does not appear to extend on to the site. The original natural vegetation on the property is therefore assumed to be a single vegetation type.

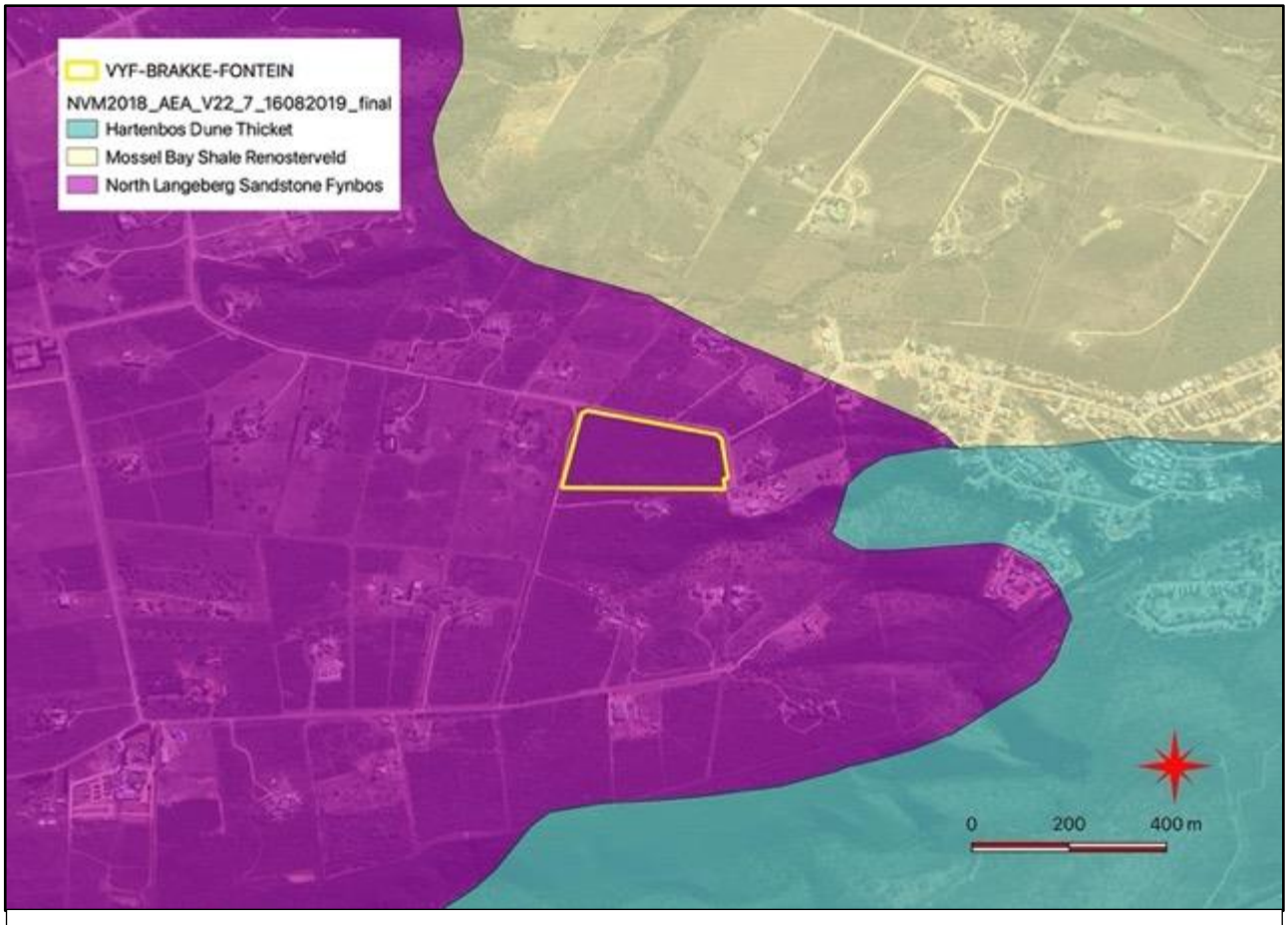

Figure 9: Regional vegetation types of the site and surrounding areas.

Conservation status of broad vegetation types

The development footprint falls entirely within North Langeberg Sandstone Fynbos, which is not listed in the Revised National Ecosystem List.

Table 3: Conservation status of different vegetation types occurring in the study area.

Vegetation Type	**Conservation status**			
	Driver *et al*. 2005 ; Mucina *et al*., 2006	**National Ecosystem List (NEM:BA) (2011)**	**2018 NBA (Skowno et al. 2019)**	**Revised National Ecosystem List (NEM:BA) (2022)**
North Langeberg Sandstone Fynbos	None	None	Least Concern	Not listed

Note that this is a desktop description of what could possibly occur on site, based on mapped ecosystems. The on-site habitat assessment, described in a section below, determines whether any such vegettion occurs on site or not.

It is therefore <u>verified</u> that the development footprint falls outside any mapped Listed Ecosystem, as listed in the Revised National List of Ecosystems that are Threatened and need of protection (GN2747 of 2022 dated 18 November 2022). The site sensitivity is therefore <u>LOW</u> with respect to this attribute.

Biodiversity Conservation Plans

The Western Cape Biodiversity Spatial Plan (WCBSP) classifies the habitats of the province according to conservation value in decreasing value, as follows:

1. Protected Areas (PA);
2. Critical Biodiversity Areas 1 (CBA1);
3. Critical Biodiversity Areas 2 (CBA2);
4. Ecological Support Area 1 (ESA1);
5. Ecological Support Area 2 (ESA2);

The WCBSP map for Mossel Bay shows that large parts of the entire property within which the development is located within areas mapped as Other Natural Area (Figure 10). Only Other Natural Areas are therefore affected by the proposed development (see Figure 10).

Note that the purpose of the specialist study, as undertaken here, is to verify whether the vegetation on site meets the standards for inclusion in a conservation zone or not. Provincial-level conservation assessments make use of remote methods for mapping and do not ground-truth all locations. It is necessary to verify on the ground whether natural habitat occurs on site or not in order to determine whether the inclusion in a conservation zone is justified.

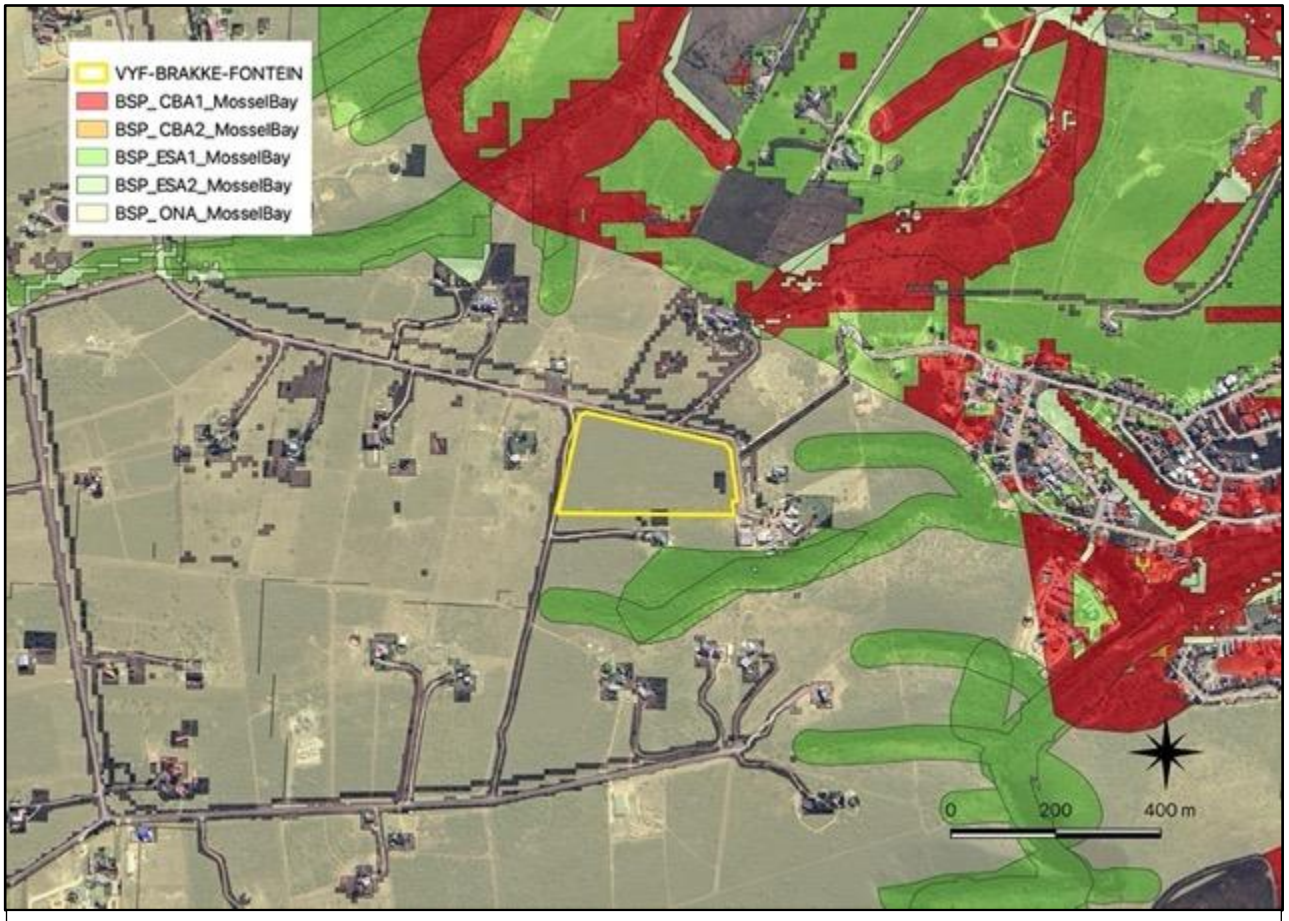

Figure 10: Western Cape Biodiversity Spatial Plan of the site and surrounding areas.

This desktop description verifies that the site is not within any conservation zones. However, an on-site assessment is required to verify the sensitivity of the site with respect to this attribute.

Historical disturbance on site

Historical aerial photographs (1939, 1963, 1974, 2003, 2006), as well as several aerial images on Google Earth (see Figure 11, for example), show that the property has always been in a natural state, with no soil disturbance from ploughing. These patterns are consistent with the vegetation patterns found on site, as determined from the site visit.

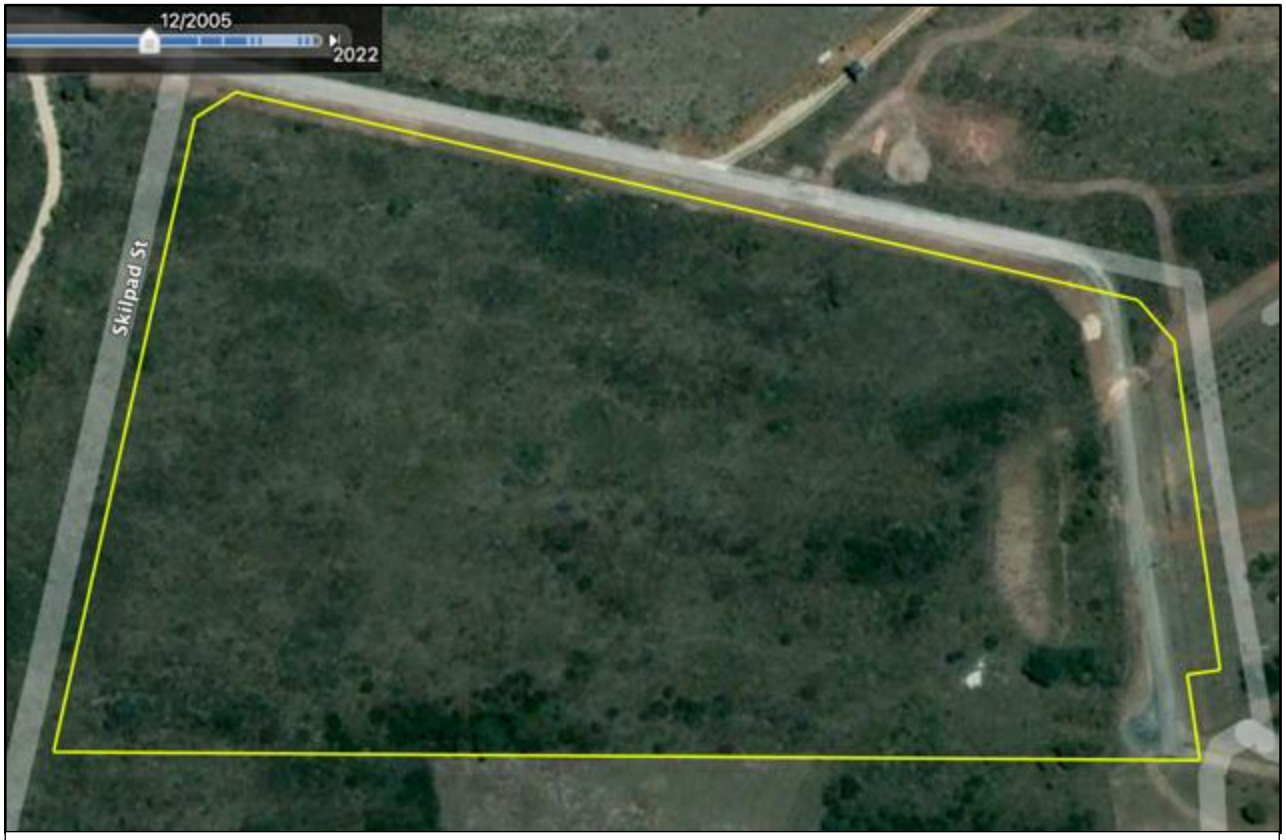

Figure 11: Historical aerial image of the property, dated December 2005.

Verification of observations on site

According to the "AMENDMENT TO THE PROTOCOLS FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL ANIMAL AND PLANT SPECIES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998", a specialist report must include the following:

5.3.4A verifiable evidence from the specialist's site inspection, including as a minimum:

5.3.4A.1 a map showing the specialist's GPS track in relation to the study area; and

5.3.4A.2 at least 4 spatially representative sample site descriptions from across the study area that include as a minimum:

(a) precise geographical coordinates of the sample site;

(b) at least one in situ photograph (taken on site by the specialist during the site inspection) of the sample site; and

(c) a habitat description of the sample site;"

To address these specific requirements, photographs of landscapes on site were taken at various localities to show conditions on site. A map showing the location of these photographs is provided in Figure 12. A GPS track log in provided in Figure 8 in the section of this report titled "Field Survey Approach".

Figure 12: Location of photographs taken on site during the site inspection.

	**Photo 4670** **34° 9' 10.15" S, 22° 4' 53.36" E** **Disturbed area on the edge of the intact fynbos (at the entrance to the site), containing a variety of grasses with *Carpobrotus* (typically occur in previously-disturbed areas in fynbos), some woody shrubs, and signs of past disturbance (such as bare ground).**
	**Photo 4671** **34° 9' 8.63" S, 22° 4' 52.76" E** **Area that appears to have been partially disturbed in the past, dominated bt grasses and *Erica discolor*.**
	**Photo 4677** **34° 9' 6.45" S, 22° 4' 51.13" E** **Typical fynbos on site, near to the north-eastern boundary, looking eastwards.**

Photo 4679
34° 9' 6.39" S, 22° 4' 48.61" E

Typical fynbos that occurs throughout the site, which has uniform structure and high cover. At a height of approximately 1 m tall, it is dominated by *Erica peltata, Erica discolor, Dicerothamnus rhinocerotis*, and *Metalasia acuta*, with a high diversity of accompanying species.

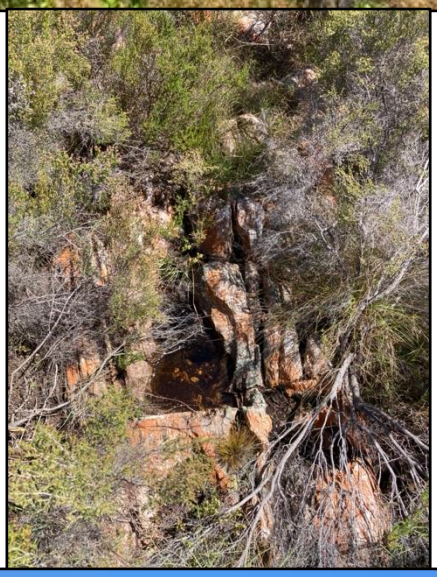

Photo 4680
34° 9' 5.02" S, 22° 4' 44.99" E

Outcrops of rocky bands within the fynbos areas.

Photo 4681
34° 9' 10.04" S, 22° 4' 40.49" E

Jeep track along southern boundary of the site. Photo taken at south-western corner.

	**Photo 4682** **34° 9' 9.95" S, 22° 4' 41.95" E** **Disturbed patch on southern boundary with large *Acacia cyclops* tree. Disturbance limited to vegetation cutting with substrate left intact.**
	**Photo 4684** **34° 9' 9.15" S, 22° 4' 47.23" E** **Area along southern part of site dominated by *Protea lanceolata*. Note high grass cover in this area.**
	**Photo 4687** **34° 9' 9.08" S, 22° 4' 50.51" E** **Typical vegetation in south-eastern corner of site with higher cover of woody shrubs than other parts of the site.**

Natural habitats on site

Based on two detailed field surveys to verify conditions on site, it was determined that the site consists of a single vegetation community, namely Fynbos, with a small amount of disturbance around the edge. There is some woody encroachment that has taken place in recent years, otherwise this pattern has been stable for nearly 100 years. A general habitat map is shown for the entire property in Figure 13. A series of photographs are provided above that give various views of the vegetation on site (in section of report "Verification of observations on site" with locations shown in Figure 12). The habitat assessment is important for understanding the natural status of the vegetation on site (whether in a natural state or secondary, and whether degraded, disturbed or in good condition), which affects the sensitivity. For the Plant Species assessment, it also provides habitats in which sensitive species could potentially occur.

Fynbos

The general fynbos on site has uniform structure over most of the area, consisting of *Erica peltata*, *Erica discolor* and *Dicerothamnus rhinocerotis* growing to a height of approximately 1 m tall. The initial impression is of relatively low local species richness, but there is a diversity of microhabitats, including local areas with ground-level rock outcrops, that contains a relatively high overall species richness. Any localised area where there has been vegetation pruning also yields high local richness.

The species composition includes a diversity of species, including *Achyranthemum paniculatum, Amphithalea violacea, Aspalathus spinosa, Asparagus mariae, Aspidoglossum gracile, Athanasia quinquedentata, Barleria pungens, Bobartia robusta, Chaenostoma denudatum, Chironia baccifera, Commelina africana, Cynanchum obtusifolium, Cyphia sylvatica, Dicerothamnus*

Figure 13: Map of habitats on site.

rhinocerotis, Erica discolor, Erica peltata, Eriocephalus africanus, Felicia muricata, Ficinia acuminata, Ficinia nigrescens, Anthospermum sp, Gerbera crocea, Gerbera piloselloides, Helichrysum patulum, Helichrysum rutilans, Helichrysum teretifolium, Hermannia flammea, Hermannia lavandulifolia, Hermannia salviifolia, Hibiscus aethiopicus, Indigofera heterophylla, Indigofera nigromontana, Jamesbrittenia microphylla, Jamesbrittenia tenuifolia, Lobelia tomentosa, Metalasia acuta, Metalasia muricata, Monsonia emarginata, Muraltia ericoides, Muraltia squarrosa, Oedera genistifolia, Oedera imbricata, Oedera pungens, Olea exasperata, Oxalis punctata, Oxalis stellata, Pelargonium carneum, Polygala pubiflora, Prismatocarpus candolleanus, ,Restio albotuberculatus Rhynchosia ciliata, Rhynchosia leucoscias, Selago corymbosa, Senecio ilicifolius, Tephrosia capensis, Ursinia discolor, Viscum capense, and *Wahlenbergia desmantha*.

There are a relatively high number of species of succulent herbs on site, including *Acrodon bellidiflorus, Adromischus caryophyllaceus, Crassula ericoides, Crassula nudicaulis, Crassula subulata, Delosperma neethlingiae, Drosanthemum* sp, and *Lampranthus elegans*. Typically for renosterveld-type vegetation, or dryer forms of fynbos, there are several grass species on site that dominate in some parts of the site. This includes the following species: *Cymbopogon pospischilii, Eragrostis capensis, Eragrostis curvula, Heteropogon contortus, Hyparrhenia hirta, Melinis nerviglumis, Stipagrostis zeyheri, Themeda triandra*, and *Urochloa serrata*.

Parts of the site are dominated by woody shrubs / small trees, including the following species: *Aloe ferox, Carissa bispinosa ,Clutia ericoides, Colpoon compressum, Diospyros dichrophylla, Lauridia tetragona, Myrsine africana, Olea europaea, Osteospermum moniliferum, Phylica axillaris, Protea lanceolata, Protea repens, Pterocelastrus tricuspidatus, Searsia incisa, Searsia lucida, Searsia pallens, Searsia pterota, Sideroxylon inerme* (PROTECTED TREE), and *Tarchonanthus littoralis*. It appears from historical aerial photographs that these areas are naturally more woody and may form part of the ecotone to thicket in the nearby valley system.

Although indicated as "Degraded areas" in the habitat map, these areas are mostly where vegetation has been cut to near ground level, or has been trampled. The original species composition is usually present in these areas, and sometimes it is the only place where some herbaceous species were observed, indicating that limited localised disturbance is important for enhancing species richness and providing opportunities for species that may be subdues by progressively aging fynbos, especially in the absence of fire for long periods of time.

SITE ECOLOGICAL IMPORTANCE

The Species Environmental Assessment Guidelines require that a Site Ecological Importance (SEI) is calculated for each habitat on site, and provides methodology for making this calculation. The SEI is assessed separately for each biodiversity theme and is assessed below specifically for the Terrestrial Biodiversity theme.

As per the Species Environmental Assessment Guidelines, Site Ecological Importance (SEI) is calculated as a function of the Biodiversity Importance (BI) of the receptor and its resilience to impacts (SEI = BI + RR). The Biodiversity Importance (BI) in turn is a function of Conservation Importance (CI) and Functional Integrity (FI), i.e. BI = CI + FI.

An assessment of habitats on site is provided below (Table 3).

Note that Receptor Resilience is calculated relative to the CURRENT status of the site. In other words, if a habitat is highly degraded and contains mostly weeds then the resilience is scored as high, because it would be easy to return it to that particular state. Conversely, where a site is in a pristine state and the vegetation is removed through development, it is almost certain that the original composition is impossible to restore, therefore the resilience is scored as Very Low.

Table 4: Site ecological importance for habitats found on site

Habitat	Conservation importance	Functional integrity	Receptor resilience	Site Ecological Importance (BI)
Fynbos	Medium Confirmed occurrence of a VU plant species listed under criterion B **(= High CI**). > 50% of receptor contains natural habitat with potential to support SCC **(= Medium CI**).	High No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing) **(= Very High FI**). Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types **(= Medium FI**) - if site considered in isolation; it is currently part of much larger connected area. Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches (if	Very low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	High (BI = Medium

		considering site as part of larger landscape - within the site the habitat connectivity is high) **(= High FI**). Taking three factors together (no ecological impacts, good connectivity & size of site), FI score of High is assigned.		
Disturbed areas	High Confirmed occurrence of a VU plant species listed under criterion B **(= High CI**). > 50% of receptor contains natural habitat with potential to support SCC **(= Medium CI**).	Low Mostly minor current negative ecological impacts with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential **(=High FI**). Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types **(= Medium FI**) - if site considered in isolation; it is currently part of much larger connected area. Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches (if considering site as part of larger landscape - within the site the habitat connectivity is high) **(= High FI**). Taking three factors together (minor ecological impacts, good connectivity & size of site), FI score of Medium is assigned.	Very low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	High (BI = Medium)

Guidelines for development activities within different importance levels are given in the Table below (Table 5).

Table 5: Guidelines for interpreting SEI in the context of the proposed development activities

Site ecological importance	Interpretation in relation to proposed development activities
Very high	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/ not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities
Very low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

Summary of site sensitivity

Although the site is within a vegetation type that is not threatened, and does not occur within any CBA or ESA, the vegetation on site is in good condition with relatively high species richness, and contains a healthy population of a vulnerable plant species. The good condition of vegetation in a natural state, the presence of the Vulnerable plant species, the good functional integrity and the low resilience to the type of disturbance that will result from the proposed development result in the SEI score being High or Very High (depending on whether the Vulnerable plant species is considered or not).

Follow-up surveys after detecting the Vulnerable plant species indicate that areas mapped as "Degraded" are, in fact, primarily where vegetation has been cut down without any significant soil disturbance. These areas have equivalent species composition as "natural" areas, including presence of the Vulnerable plant species. Sometimes these disturbed zones are the location for species not detected elsewhere on site, meaning that the disturbance is sufficient enough to open the vegetation up in a similar way as burning, but not enough to degrade the species composition of the vegetation.

Figure 14: Terrestrial Biodiversity species theme sensitivity for the site.

IMPACT ASSESSMENT

Proposed development

The proposal is to develop residential areas on site. The proposed development layout is shown in Figures 4 and 5, which are variations. The development will be located within habitats in the VERY HIGH and HIGH Site Ecological Importance classes.

For the assessment undertaken here, two alternatives are being considered:

1. Alternative 1: No-Go Alternative: continued current land use.
2. Alternative 2: Development Alternative: development of most of the site.

Any comparisons below between the development proposal and the "No-go" alternative are for the same area (proposed development area).

Alternative 1

This is the "No-go" alternative. The property will remain vacant and under current management. Current burning regimes and alien invasive levels are likely to remain relatively static. There is currently no ecological burning regime for the site. The impact of this is uncertain but likely to lead to fynbos senescence and possible loss of species. Fynbos becomes moribund in the absence of fire, therefore any fynbos species would require some fire management. Alien invasive plants are under control, which may continue under the present ownership, but could change.

Alternative 2

This is the preferred development option. Under this option there is likely to be almost complete loss of natural vegetation on site. Areas not lost to development are likely to undergo elevated disturbance into the future, including absence of fire and probable increase in invasion by alien plant species, which are favoured by disturbance.

Alternative 3

This is the alternative (original) development option. Under this option there is likely to be almost complete loss of natural vegetation on site. Areas not lost to development are likely to undergo elevated disturbance into the future, including absence of fire and probable increase in invasion by alien plant species, which are favoured by disturbance.

Affected sensitivities

All areas within the proposed development footprint are within areas of natural vegetation.

The impacts assessed here are therefore as follows:

1. DIRECT LOSS OF SECONDARY HABITAT WITHIN ONA.
2. INVASION BY ALIEN INVASIVE PLANT SPECIES.

Assessment of impacts

Degradation of habitat within ONA: Alternative 1 (No-go)

Extent of impact
The impact will occur at the local scale. The development site assessed here for the "No-go" option is 5.16 hectares in size, which is relatively insignificant at a regional level. The impact is therefore scored as SITE.

Duration of impact
Management of natural vegetation is a LONG-TERM issue.

Probability of occurrence
Based on the current status and the known location of natural habitats found on site, the impact will be POSSIBLE and mostly due to **indirect** impacts.

Reversibility of impact
Impacts due to inappropriate fire regimes and invasion by alien plants is partly reversible.

Degree to which resources will be irreplaceably lost
Due to the site being small, marginal loss of resources will take place.

Intensity or magnitude of impact
Relative to the current status, possible impacts may affect the quality, use and integrity of the system/component in a way that is barely perceptible, therefore impacts will be of LOW magnitude.

Significance of impact
The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

On this basis, the impact is calculated as [(Extent = 1) + (Probability = 2) + (Reversibility = 2) + (Irreplaceability = 2) + (Duration = 3)] x (Intensity = 1)

Score = 10 = LOW negative significance

Possible mitigation measures:
No mitigation is envisaged therefore the "post-mitigation" score is identical.

Issue	Degradation of natural habitat	
Description of Impact		
Poor management of habitat may result in long-term degradation of vegetation on site		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Operation	
Criteria	**Without Mitigation**	**With Mitigation**
Extent	Site	Site
Duration	Long-term	Long-term
Probability	Possible	Possible

Degree to which impact may cause irreplaceable loss of resources	Marginal loss of resources	Marginal
Degree to which impact can be reversed	Partly reversible	Partly reversible
Intensity	Low	Low
Significance	Low -	Low -

Direct loss of habitat: Alternatives 2 and 3 (development)

Extent of impact
The impact will occur at the local scale. The impact is therefore scored as SITE. (However, the effect can also be assessed at a district scale to account for the potential regional value of the vegetation on site).

Duration of impact
Clearing of natural vegetation will result in a PERMANENT impact (cannot be reversed).

Probability of occurrence
Based on the proposed development plan and the known location of habitats found on site, the impact will be DEFINITE and mostly due to direct impacts.

Reversibility of impact
Loss of original habitat is irreversible.

Degree to which resources will be irreplaceably lost
At a regional scale, marginal loss of resources will take place.

Intensity or magnitude of impact
At a site scale, impacts will result in system components ceasing to function, therefore impacts will be of VERY HIGH magnitude. (If assessed at a district scale, then magnitude would be MEDIUM).

Significance of impact
The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

On this basis, the impact is calculated as [(Extent = 1) + (Probability = 4) + (Reversibility = 4) + (Irreplaceability = 2) + (Duration = 4)] x (Intensity = 5)

Score = 75 = VERY HIGH negative significance at a SITE scale.
Score = 32 = MEDIUM negative significance at a DISTRICT scale.

Possible mitigation measures:
According to the guidelines for interpreting Site Ecological Importance in the context of proposed development activities, minimisation and restoration mitigation is required in habitats with Low sensitivity. The following mitigation measures are therefore proposed:

1. Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.
2. Use indigenous and site-appropriate plant species in any rehabilitation and landscaping.
3. No additional clearing of vegetation should take place without a proper assessment of the environmental impacts, unless for maintenance purposes, in which case all reasonable steps should be taken to limit damage to natural areas.
4. Obtain permits for any protected trees that may need to be pruned or removed.

Post-mitigation impact is calculated as [(Extent = 1) + (Probability = 4) + (Reversibility = 4) + (Irreplaceability = 2) + (Duration = 4)] x (Intensity = 5)

Score = 75 = VERY HIGH negative significance at a SITE scale.
Score = 32 = MEDIUM negative significance at a DISTRICT scale.

Issue	Loss of natural habitat	
Description of Impact		
Construction activities will result in clearing of natural habitat, to be replaced by the infrastructure. This will result in permanent local loss of vegetation		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	**Without Mitigation**	**With Mitigation**
Extent	Site (District)	Site (District)
Duration	Permanent	Permanent
Probability	Definite	Definite
Degree to which impact may cause irreplaceable loss of resources	Marginal loss of resources	Marginal
Degree to which impact can be reversed	Irreversible	Irreversible
Intensity	Very High (Site), Medium (District)	Very High (Site), Medium (District)
Significance (site scale)	Very High -	Very High -
Significance (district scale)	Medium -	Medium -

Invasion by alien invasive plant species: Alternative 1 (No-go)

Extent of impact
The impact will occur at the site scale. The impact is therefore scored as SITE.

Duration of impact
Severe invasion (worst-case scenario) can cause irreversible ecosystem changes that will result in a PERMANENT impact (cannot be reversed). However, under current legislation, alien control is required by law, therefore effects are more likely to be LONG-TERM.

Probability of occurrence
Based on the presence of several potentially destructive alien invasive species in the region and nearby, it is likely that continuous invasion will occur, therefore the impact will be PROBABLE.

Reversibility of impact
Degradation of habitat is partly reversible.

Degree to which resources will be irreplaceably lost
Marginal loss of resources is likely to take place (vegetation), although significant loss of resources is possible in the absence of any control measures.

Intensity or magnitude of impact
In terms of the effect of alien invasive species on natural vegetation, severe invasion is potentially an impact that affects the continued viability of the natural ecosystems on site, therefore impacts will be of HIGH magnitude/intensity.

Significance of impact
The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

On this basis, the impact is calculated as [(Extent = 1) + (Probability = 3) + (Reversibility = 3) + (Irreplaceability = 3) + (Duration = 3)] x (Intensity = 3)

Score = 39 = MEDIUM negative significance

Possible mitigation measures:
Under the "No-go" option, it is assumed that no alien control as mitigation could be applied.
Post-mitigation impact is calculated as [(Extent = 1) + (Probability = 2) + (Reversibility = 2) + (Irreplaceability = 1) + (Duration = 2)] x (Intensity = 1)

Score = 8 = LOW negative significance

Issue	Invasion by alien invasive plant species, leading to degradation of indigenous habitat	
Description of Impact		
Disturbance and clearing of natural habitat leads to conditions that are ideal for alien invasive species to colonise. Once present, they modify the environment in ways that limit recovery of indigenous habitat..		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Construction, Operation	
Criteria	**Without Mitigation**	**With Mitigation**
Extent	Site	Site
Duration	Long-term	Long-term
Probability	Probable	Probable
Degree to which impact may cause irreplaceable loss of resources	Significant	Marginal
Degree to which impact can be reversed	Partly reversible	Partly reversible
Intensity	High	Low
Significance	Medium -	Low -

Invasion by alien invasive plant species: Alternatives 2 and 3 (development)

Extent of impact
The impact will occur at the site scale and is therefore scored as SITE.

Duration of impact
Severe invasion (worst-case scenario) can cause irreversible ecosystem changes that will result in a PERMANENT impact (cannot be reversed). However, under current legislation, alien control is required by law, therefore effects are more likely to be LONG-TERM.

Probability of occurrence
Based on the presence of several potentially destructive alien invasive species in the region and nearby, it is almost certain that disturbance will lead to invasion, therefore the impact will be PROBABLE.

Reversibility of impact
Loss of secondary habitat is partly reversible.

Degree to which resources will be irreplaceably lost
Marginal loss of resources will take place (secondary vegetation).

Intensity or magnitude of impact
In terms of the effect of alien invasive species on secondary vegetation, severe invasion is potentially an impact that affects the continued viability of the natural ecosystems on site, therefore impacts will be of HIGH magnitude/intensity.

Significance of impact
The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

On this basis, the impact is calculated as [(Extent = 1) + (Probability = 3) + (Reversibility = 3) + (Irreplaceability = 2) + (Duration = 3)] x (Intensity = 3)

Score = 36 = MEDIUM negative significance

Possible mitigation measures:
Early detection and effective management, as well as limiting disturbance to vegetation, are all measures that can effectively prevent and control alien invasions. The following mitigation measures are therefore proposed:

1. Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.
2. Use indigenous and site-appropriate plant species in any rehabilitation and landscaping.
3. Protect natural areas outside of the development footprint from disturbance.

Post-mitigation impact is calculated as [(Extent = 1) + (Probability = 2) + (Reversibility = 2) + (Irreplaceability = 1) + (Duration = 2)] x (Intensity = 1)

Score = 8 = LOW negative significance

Issue	Invasion by alien invasive plant species, leading to degradation of indigenous habitat	
Description of Impact		
Disturbance and clearing of natural habitat leads to conditions that are ideal for alien invasive species to colonise. Once present, they modify the environment in ways that limit recovery of indigenous habitat..		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Construction, Operation	
Criteria	**Without Mitigation**	**With Mitigation**
Extent	Site	Site
Duration	Long-term	Medium-term
Probability	Probable	Possible
Degree to which impact may cause irreplaceable loss of resources	Marginal	None
Degree to which impact can be reversed	Partly reversible	Partly reversible
Intensity	High	Low
Significance	Medium -	Low -

OFFSETS

The THE NATIONAL BIODIVERSITY OFFSET GUIDELINE, published under the NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) on 23 June 2023, provides guidelines for when offsets are required.

According to this Guideline, "*a biodiversity offset is required when a proposed listed or specified activity, or activities, is/are likely to have residual negative impacts on biodiversity of medium or high significance. These negative impacts could affect biodiversity patterns (e.g. threatened ecosystems, species or special habitats), ecological processes (e.g. migration patterns, climate change corridors enabling shifts in species distributions over time, or wetland function), ecosystem services (e.g. provision of clean water) or a combination of all three*".

For the current site, residual impacts due to loss of natural vegetation (at a district scale) were evaluated as having MEDIUM significance, which triggers the requirement for a biodiversity offset. Table 1 on pages 30 - 31 of the Guideline provides categories of the importance of biodiversity and/or ecological infrastructure. According to this table, the biodiversity on site fits into two categories:

1. Biodiversity of potential concern: Irreversible loss of Vulnerable plant species.
2. Biodiversity of low concern: Irreversible loss of Not Threatened or Least Concerned ecosystems.

Loss of habitat (with a residual impact significance of Medium) falls into the category of "Irreversible loss of biodiversity of low concern". Based on the remaining ecosystem extent and ecosystem protection level for North Langeberg Sandstone Fynbos (with a remaining extent of 92%), the vegetation on site falls into Band 4 for determining the offset ratio (see Table on page 35 of the guideline), which prescribes a 0% offset ratio. On this basis, it is concluded that no offset is required for this impact.

No specific guidelines are provided in the Guideline for listed species, but the particular Vulnerable plant species affected by this development (*Polygala pubiflora*) has a relatively wide distribution, and has been recorded at numerous locations throughout its range. The Vyf Brakke Fonteinen / Aalwyndal area of Mossel Bay is an area where it is particularly regularly encountered across most properties in the area. Loss of the population on site is assessed as an impact of Low significance (will not affect the conservation status of the species), although cumulative impacts for the Aalwyndal area (if the entire area is developed) are potentially of higher significance over the longer term. Nevertheless, the threshold for requiring offsets for the current proposed development is not exceeded and offsets are therefore not required for this impact.

SUMMARY & CONCLUSIONS

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for the terrestrial biodiversity theme:

1. The regional vegetation type within which the site is located is North Langeberg Sandstone Fynbos, which is assessed as Least Concern and not listed. The site is also not within any CBA or ESA. The natural vegetation of the site therefore has Low sensitivity, according to Screening Tool criteria. However, the Site Ecological Importance score is calculated as being High, based on the fact that the habitat on site is in a natural state, with high functional integrity and low resistance to the type of disturbance associated with the proposed development.

2. The habitat on site is fynbos with a reltively high species richness, including the presence of two Vulnerable plant species, *Polygala pubiflora* and *Hermannia lavandulifolia*. (The status of this second plant species is currently being re-evaluated and it is likely to be re-assessed as having lower threat status).

3. An impact assessment indicates that loss of natural vegetation on site has an impact of Medium significance at a district level, primarily due to the fact that the impact is definite, permanent and irreversible. At a district scale, loss of the 4.17 ha of habitat on site would result in the overall ecosystem in the Aalwyndal area (at worst) continuing to function in a moderately modified way and maintaining general integrity (some impact on integrity).

4. The NATIONAL BIODIVERSITY OFFSET GUIDELINE indicates that residual impacts of Medium significance require offsets, but the offset ratio for the regional vegetation type, North Langeberg Sandstone Fynbos (with a remaining extent of 92%), is 0%, which indicates that offsets are not required for this impact.

5. Loss of the population of the Vulnerable plant species, Polygala pubiflora, has an overall significance of Low for the current project, although long-term cumulative impacts for the Aalwyndal area may be Medium. Nevertheless, the threshold for requiring offsets for this impact for this project are not exceeded, therefore offsets are not required for this impact.

RECOMMENDATIONS

- If any protected trees are to be affected by the proposed development, it is a requirement that a permit be obtained, as per the National Forests Act. These were recorded as scatterred individuals along the south-eastern boundary of the site (see Plant Theme report).

- An ongoing alien invasive management programme should take place on site. This will protect neighbouring sensitive habitats from degradation and could potentially be the biggest contribution to maintaining and protecting biodiversity on site and in surrounding areas.

REFERENCES

CapeNature. 2017 WCBSP Mossel Bay [Vector] 2017. Available from the Biodiversity GIS website, downloaded on 03 June 2022

Grobler, A., Vlok, J., Cowling, R, van der Merwe, S., Skowno, A.L., Dayaram, A. 2018. Technical Report: Integration of the Subtropical Thicket Ecosystem Project (STEP) vegetation types into the VEGMAP national vegetation map 2018.

Mucina, L. And Rutherford, M.C. (editors) 2006. Vegetation map of South Africa, Lesotho and Swaziland: an illustrated guide. *Strelitzia* 19, South African National Biodiversity Institute, Pretoria.

National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. Synthesis Report. South African National Biodiversity Institute.

Rebelo, A.G., Boucher, C., Helme, N., Mucina, L., Rutherford, M.C., Smit, W.J., Powrie, L.W., Ellis, F., Lambrechts, J.J., Scott, L., Radloff, F.G.T., Johnson, S.D., Richardson, D.M., Ward, R.A., Procheş, S.M., Oliver, E.G.H., Manning, J.C., Jürgens, N., McDonald, D.J., Janssen, J.A.M., Walton, B.A., Le Roux, A., Skowno, A.L., Todd, S.W. & Hoare, D.B. 2006. Fynbos Biome. In: Mucina, L. & Rutherford, M.C. (eds), The vegetation of South Africa, Lesotho and Swaziland: 52-219. SANBI, Pretoria.

Skowno AL, Matlala M, Slingsby J, Kirkwood D, Raimondo DC, von Staden L, Holness SD, Lotter M, Pence G, Daniels F, Driver A, Desmet PG, Dayaram A (2019). Terrestrial ecosystem threat status assessment 2018 - comparison with 2011 assessment for provincial agencies. National Biodiversity Assessment 2018 Technical Report. South African National Biodiversity Institute, Pretoria.

Appendix 1: Plant species recorded on site.

Acacia cyclops (Invader Category 1b)
Achyranthemum paniculatum
Acrodon bellidiflorus
Adromischus caryophyllaceus
Aloe arborescens × ferox
Aloe ferox
Amphithalea violacea
Anthospermum sp
Aspalathus spinosa
Asparagus mariae
Aspidoglossum gracile
Athanasia quinquedentata
Barleria pungens
Bobartia robusta
Carissa bispinosa
Carpobrotus edulis
Chaenostoma denudatum
Chironia baccifera
Clutia ericoides
Colpoon compressum
Commelina africana
Crassula ericoides
Crassula nudicaulis
Crassula subulata
Cymbopogon pospischilii
Cynanchum obtusifolium
Cyphia sylvatica
Delosperma neethlingiae DDT
Dicerothamnus rhinocerotis
Diospyros dichrophylla
Drosanthemum sp
Eragrostis capensis
Eragrostis curvula
Erica discolor
Erica peltata
Eriocephalus africanus
Felicia muricata
Ficinia acuminata
Ficinia nigrescens
Gerbera crocea
Gerbera piloselloides
Helichrysum patulum
Helichrysum rutilans
Helichrysum teretifolium
Hermannia flammea
Hermannia lavandulifolia VU A2c
Hermannia salviifolia
Heteropogon contortus
Hibiscus aethiopicus
Hyparrhenia hirta
Indigofera heterophylla
Indigofera nigromontana

Jamesbrittenia microphylla
Jamesbrittenia tenuifolia
Lampranthus elegans
Lauridia tetragona
Lobelia tomentosa
Melinis nerviglumis
Metalasia acuta
Metalasia muricata
Monsonia emarginata
Muraltia ericoides
Muraltia squarrosa
Myrsine africana
Oedera genistifolia
Oedera imbricata
Oedera pungens
Olea europaea
Olea exasperata
Osteospermum moniliferum
Oxalis punctata
Oxalis stellata
Pelargonium carneum
Phylica axillaris
Pittosporum viridiflorum
Polygala pubiflora VU B1ab(ii,iii,iv)+2ab(ii,iii,iv)
Prismatocarpus candolleanus
Protea lanceolata
Protea repens
Pterocelastrus tricuspidatus
Restio albotuberculatus
Rhynchosia ciliata
Rhynchosia leucoscias
Searsia incisa
Searsia lucida
Searsia pallens
Searsia pterota
Selago corymbosa
Senecio ilicifolius
Sideroxylon inerme (Protected NFA)
Stipagrostis zeyheri
Tarchonanthus littoralis
Tephrosia capensis
Themeda triandra
Urochloa serrata
Ursinia discolor
Viscum capense
Wahlenbergia desmantha