Aquatic Biodiversity Compliance Statement

Proposed Residential Development on Erven 1469, 1470, 1471, 1473 and 1479, Van Dyksbaai, Western Cape

For: Lornay Environmental Consulting

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Report Information

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Executive Summary

An Environmental Authorisation (EA) application for a proposed Residential Development on Erven 1469, 1470, 1471, 1473 and 1479, Van Dyksbaai, Western Cape Province, is currently being undertaken. The proposed development area, i.e. Erven 1469, 1470, 1471, 1473 and 1479 will be further referred to in this report as the "study area". The study area is located south of Dyer Street in Van Dyksbaai, within the Overstrand Municipality.

According to the Department of Forestry, Fisheries, and the Environment (DFFE) national web-based environmental screening tool report generated for the study area, the Combined Aquatic Biodiversity Theme Sensitivity is classified as "Very High" (DFFE, 2024). The classification trigger is the location of mapped Western Cape Biodiversity Spatial Plan (WCBSP, 2017) aquatic Ecological Support Areas 1 (ESAs) within the area.

Given that the study area may have potential aquatic biodiversity constraints, Delta Ecology was appointed by Lornay Environmental Consulting to undertake an aquatic biodiversity assessment with the aim of (1) verifying the site sensitivity with regards to aquatic biodiversity; and (2) clarify aquatic biodiversity constraints within the study area. This report sets out the results from a desktop analysis, as well as a field assessment, to clarify aquatic biodiversity constraints associated with the proposed Residential Development.

During the desktop assessment, it was determined that there were no mapped rivers, or natural / artificial wetlands within the proposed study area, or within 500 m thereof, according to the National Wetland Map Version 5 (NWM5) (SANBI, 2018), the National Freshwater Ecosystem Priority Area (NFEPA) spatial data (CSIR, 2011), as well as the NGI topographical and watercourse information. According to the WCBSP (2017), the study area overlays an aquatic Ecological Support Area (ESA) 1 and 2 due to a "Coastal Corridor, Watercourse".

After the field assessment, it was determined that there were no watercourse conditions present within the study area, i.e. no topographical (riverbed/channel or banks), hydric soils, hydrophytic or riparian vegetation. No criteria used to identify a watercourse as per the National Water Act (NWA) (Act 36 of 1998) were present within the study area.

Soil samples taken from various locations within the study area indicated well-drained, light brown to greyish sand. Dominant vegetation consisted of terrestrial species *Searsia lucida* (Blinktaaibos), *Searsia glauca* (Blue Kunirhus), *Satyrium carneum* (Pink Satyre), *Agathosma capensis* (Cape Buchu) and *Helichrysum patulum* (Honey Everlasting) among others. The alien invasive *Acacia cyclops* (Rooikrans Wattle) was also present within the study area.

The study area was deemed to be of "Low" aquatic sensitivity given the lack of watercourses present. From an aquatic ecological perspective, there should be no reason the proposed Residential Development cannot be approved.

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A signed statement of independence will be provided as a separate document.

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Robyn Morton has a MSc. degree in Conservation Sciences from the Cape Peninsula University of Technology. Throughout her studies, internships, and consultancy experience, she has gained valuable and informed insight into the functioning of natural and socio-ecological systems, as well as many key research and monitoring skills. Prior to her consulting career, Robyn worked for Zandvlei Estuary Nature Reserve for 4 years and gained experience in the field of urban wetland and estuary management. Robyn specialises in aquatic ecology and is currently working for Delta Ecology as a junior associate under the guidance of Kimberley van Zyl.

A signed statement of independence will be provided as a separate document.

1. Introduction

An Environmental Authorisation (EA) application for a proposed Residential Development on Erven 1469, 1470, 1471, 1473 and 1479, Van Dyksbaai, Western Cape Province (**Figure 1-1**), is currently being undertaken. The proposed development area, i.e. Erven 1469, 1470, 1471, 1473 and 1479 will be further referred to in this report as the "study area". The study area is located south of Dyer Street in Van Dyksbaai, within the Overstrand Municipality (**Figure 1-2**).

According to the Department of Forestry, Fisheries, and the Environment (DFFE) national web-based environmental screening tool report generated for the study area, the Combined Aquatic Biodiversity Theme Sensitivity is classified as "Very High" (DFFE, 2024). The classification trigger is the location of mapped Western Cape Biodiversity Spatial Plan (WCBSP, 2017) aquatic Ecological Support Areas (ESAs) within the area (**Figure 1-3**).

Given that the study area may have potential aquatic biodiversity constraints, Delta Ecology was appointed by Lornay Environmental Consulting to undertake an aquatic biodiversity assessment with the aim of (1) verifying the site sensitivity with regards to aquatic biodiversity; and (2) clarify aquatic biodiversity constraints within the study area.

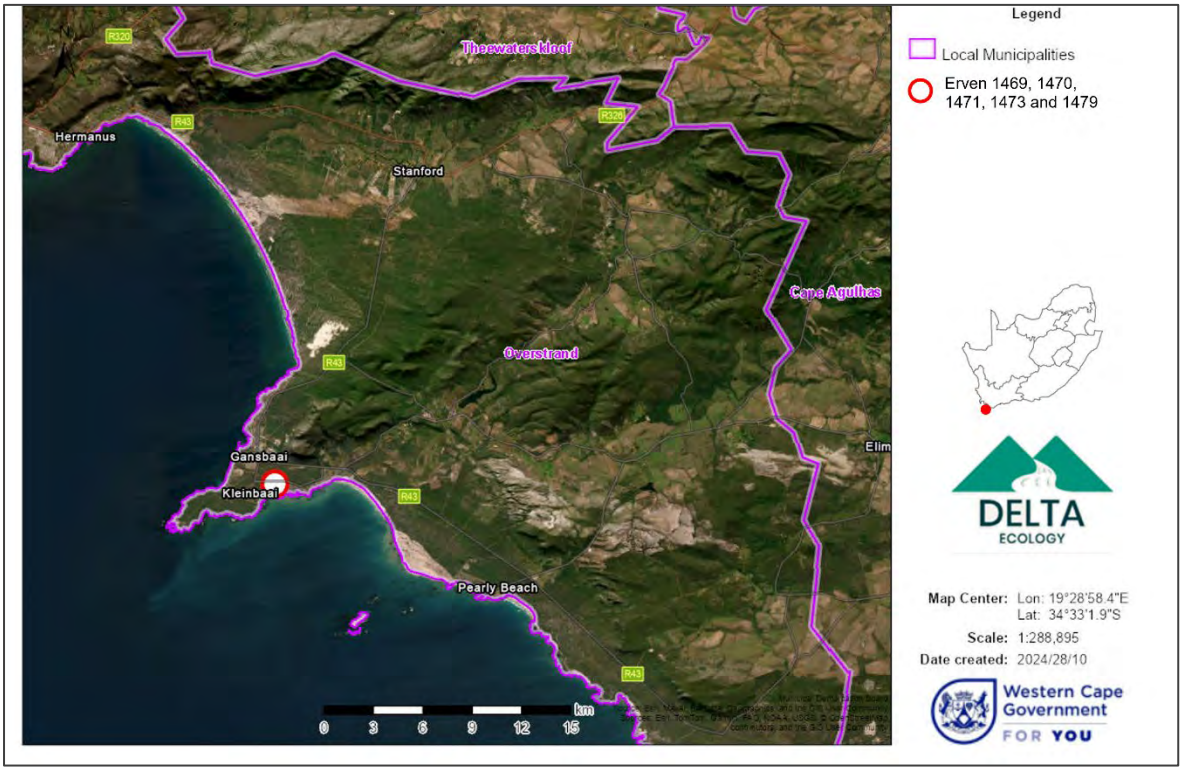

Figure 1-1: Regional location of the proposed study area.

Figure 1-2: Location of the study area.

Figure 1-3: Aquatic Biodiversity Sensitivity according to the DFFE Screening Tool.

1.1. Terms of Reference

The Terms of Reference (ToR) agreed upon for this aquatic biodiversity assessment include:

- A desktop background assessment to identify potential aquatic biodiversity constraints within the proposed study area and within the 500 m regulated proximity thereof.
- A field assessment to confirm aquatic biodiversity constraints.
- Delineation of any watercourse (s) using a combination of site-based and desktop methodologies as appropriate.
- Drafting of an aquatic biodiversity compliance statement including the following:
    - General site description.
    - Site sensitivity verification.
    - Description of the drivers and key components of any watercourse (s) (as applicable) that are likely to be impacted by the proposed development.
    - Clarification of the legislative implications and authorisation processes required for various development scenarios if applicable; and
    - Recommendations for minimisation of aquatic biodiversity impact if applicable.

1.2. Limitations and Assumptions

The following limitations and assumptions apply to this assessment:

- The site assessment was undertaken on the 17th of October 2024, during the spring season. Therefore, this assessment does not cover complete seasonal variation in conditions at the site. This is however, in the opinion of the specialist, of no material consequence to outcome of this assessment, as any potential watercourse areas were verified infield using the necessary methodology described in Section 3.2 and 3.3.
- Additionally, soil morphology could be used as the primary determinant of wetland presence as per Department of Water Affairs and Forestry (DWAF[1]), 2005, which states:

"More emphasis should be placed on identifying wetlands by applying the hydric soils criterion. Also, unlike the vegetation which changes with an altered hydrological regime, the morphological indicators of a hydric soil are relatively permanent. Hydric soils are therefore suitable to identify land which "in normal circumstances supports or would support vegetation typically adapted to life in saturated soil" as per the Water Act."

1.3. Use of this report

This report reflects the professional judgement of its author and, as such, the full and unedited contents of this should be presented in any application to relevant authorities. Any summary of the findings should only be produced with the approval of the author.

[1] Now Department of Water and Sanitation (DWS).

2. Site Sensitivity Verification

According to the Department of Forestry, Fisheries, and the Environment (DFFE) national web-based environmental screening tool report generated for the proposed study area, the Combined Aquatic Biodiversity Theme Sensitivity is classified as "Very High" (DFFE, 2024). The classification trigger is the location of aquatic ESA 1 within the area (**Figure 1-3**).

As per the National Environmental Management Act (NEMA) (Act No. 107 of 1998) Regulations of 2020 (as amended) (GN R. 320 of 2020), prior to initiation of specialist assessments, the current land use, and the potential environmental sensitivity of the site (s) - as identified by the national web-based environmental screening tool - must be confirmed by undertaking an Initial Site Sensitivity Verification. This Initial Site Sensitivity Verification aims to confirm or dispute the current use of the land and environmental sensitivity as identified by the national web based environmental screening tool.

The Initial Site Sensitivity Verification was undertaken by a desktop assessment of the study area, and a field assessment conducted on the 17th of October 2024. The study area was deemed to be of "Low" aquatic sensitivity.

There are no mapped watercourses within the proposed study area or within the 500 m regulated proximity according to the National Wetland Map 5 (NWM5) (SANBI, 2018), the National Freshwater Ecological Priority Areas (NFEPA) spatial data (CSIR, 2011), as well as the topographical and watercourse information from the Department of Rural Development and Land Reform (DRDLR). During the field assessment, the study area was determined to be terrestrial, with no natural or functional watercourses present.

According to GN R. 320 of 2020, if the specialist determines that the Aquatic Biodiversity sensitivity of the site is "Low", then an Aquatic Compliance Statement Report must be compiled as part of the EA process.

3. Methodology

The methodology used in this aquatic biodiversity compliance statement report, including a desktop background assessment and one site visit, is outlined in the subsections below.

3.1. Desktop Assessment

A review of desktop resources was undertaken to determine the nature of the proposed study area, the presence of watercourses in the vicinity, and the significance of the area in terms of biodiversity planning. The following desktop resources were consulted:

- Topographical and watercourse information from the Department of Rural Development and Land Reform (DRDLR);
- The South African Atlas of Climatology and Agrohydrology (1997, 2007, and 2009).
- Geological information from the Council for Geoscience.
- The South African National Biodiversity Institute (SANBI) (2018) National Vegetation Map (NVM).
- The National Wetlands Map Version 5 (NWM5 – SANBI, 2018).
- The National Freshwater Ecological Priority Areas (NFEPA – CSIR, 2011) wetland, wetland vegetation group classification, river, & Freshwater Ecological Priority Areas (FEPA) datasets.
- The Chief Directorate: National Geo-spatial Information (NGI) (DRDLR) Rivers and Topography dataset.
- The Western Cape Biodiversity Spatial Plan (WCBSP, 2017).

3.2. Wetland Identification & Delineation

Watercourses, if present, were identified and delineated using the method described in the Manual for the Identification and Delineation of Wetlands and Riparian Areas for field-based delineation (DWAF, 2008). This method is the accepted best practice method for delineating watercourses in South Africa and its use is required by GN 509.

For wetlands, the method makes use of four key field indicators to guide the delineation process (refer to **Box 1**):

Box 1. Four indicators of wetland presence as described in DWAF (2008):

1. The **position in the landscape** – Identifies parts of the landscape where wetlands are more likely to occur;
2. The presence of **aquatic vegetation communities**;
3. The presence of **hydromorphic soil features**, which are morphological signatures that appear in soils with prolonged periods of saturation (associated with anaerobic conditions). Key hydromorphic features include:
    a. Mottling – Formation of clumps of iron oxide within the soil matrix in the form of orange, yellow, black, or reddish-brown speckling. Mottling occurs in most soils and reaches maximum density in the centre of the seasonal zone with sparse mottling in the temporary zone and no mottling in the permanent zone.
    b. Gleying – Shift in soil colour from the terrestrial baseline towards a blue, green, or grey colour and an overall reduction in soil chroma. This phenomenon is normally difficult to identify in the temporary zone, noticeable in the seasonal zone and most significant in the permanent zone.
    c. Organic Surface Layers – surface layers with very high organic content that typically occur in the wetland seasonal and permanent zones.
    d. Organic Streaking – Streaks of organic matter within the soil column which may be present in all zones, but particularly the temporary and seasonal zones.

Soil samples were taken for inspection by hand augering to determine soil form and presence of redoximorphic and other hydromorphic soil features. Aquatic vegetation communities were identified using the (DWAF, 2008) classification of wetland plant species, along with auxiliary information (Van Ginkel *et al.,* 2011). Wetland plant species classification categories are as follows:

- Obligate species (occurring in wetlands >99% of the time – usually in the permanent or seasonal zone);
- Facultative Positive species (67 to 99% of the population occurs within wetlands – typically in the seasonal and temporary zones with the remaining 1 to 33% in the adjacent area on the wetland periphery);
- Facultative Species (33 – 67% of the population occurs within wetlands – usually in seasonal or temporary zones with the remaining 67 – 33% in the adjacent area on the wetland periphery);
- Facultative Negative Species (1 – 33% of the population occurs within wetlands – usually in the temporary zone with the remaining 99 to 67% in the adjacent area on the wetland periphery); and
- Wetland Cosmopolitan Species (No specific affinity for wetlands; colonise wetland and terrestrial areas).

3.3. Riparian Area Delineation

Riparian areas were identified using the method described in the DWAF, (2008) Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas. This method is the accepted best practice method for identifying and delineating riparian areas in South Africa and its use is required by GN 509. The method makes use of four key field indicators (refer to **Box 2**):

Box 2. Four indicators of riparian areas as described in DWAF (2008)

1. The **position in the landscape** – riparian areas are only likely to develop on valley bottom landscape units.
2. The **soil form** – Riparian areas are often (but not always) associated with alluvial soils and recently deposited material.
3. **Topography** associated with riparian areas – riparian areas may have clearly identifiable banks associated with alluvial deposited material adjacent to the active channel.
4. The presence of **aquatic vegetation communities.**

The identification of riparian areas relies heavily on vegetative indicators. Using vegetation, the outer boundary of a riparian area can be defined as the point where a distinctive change occurs in the:

- species composition relative to the adjacent terrestrial area; and
- physical structure, such as vigour or robustness of growth forms of species similar to that of adjacent terrestrial areas. Growth form refers to the health, compactness, crowding, size, structure and/or numbers of individual plants.

In addition to indicators of structural differences in vegetation, indicator species themselves can be used to denote riparian areas. Riparian plant species classification categories are as follows:

- Obligate riparian species occur almost exclusively in the riparian zone (> 90% probability)
- Preferential riparian species are preferentially, but not exclusively, found in the riparian zone (>75% probability). Preferential riparian species may harden to drought conditions but will always indicate sites with increased moisture availability.

3.4. Watercourse Classification

The Ollis *et al* (2013) Classification System for Wetlands and Other Aquatic Ecosystems in South Africa, as used in this assessment, is a tiered structured classification system that provides a uniform description of wetland types based on their hydrogeomorphic characteristics. This classification system categorises wetlands into 7 distinct hydrogeomorphic units described in **Figure 3-1**.

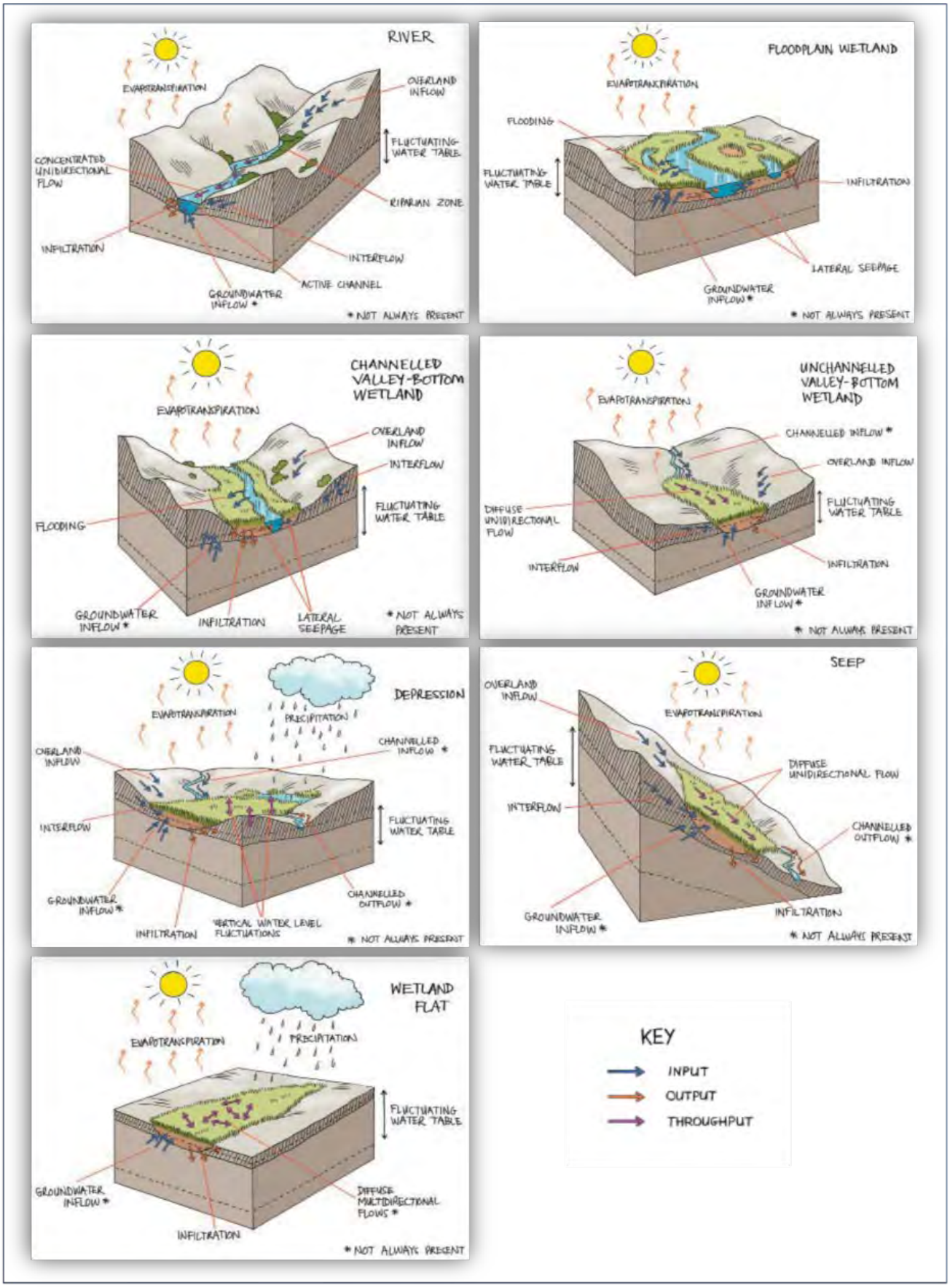

Figure 3-1: Wetland Hydrogeomorphic Types as defined in the Classification System for Wetlands and Other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013).

4. Desktop Assessment

A review of desktop resources was undertaken and a summary of key information relevant to this assessment is provided below.

4.1. Biophysical Context

The general biophysical characteristics of the proposed study area under evaluation are summarised in **Table 4-1**. The proposed development area is situated in quaternary catchment G40L. The catchment is predominantly characterised by flat coastal plains surrounded by steep mountain slopes. The study area is situated on relatively flat terrain that slopes gradually in a south westerly direction toward the sea.

The study area falls within the BSk class of the Köppen-Geiger Climate Classification (Beck *et al*., 2018), and therefore experiences a cold, semi-arid climate characterised by warm to hot dry summers, and cold, possibly freezing winters (**Figure 4-1**). The area receives a mean annual rainfall of 512 mm, which mostly occurs during the winter months of June to August (Schulze, 2009). The mean annual temperature is 16.10 °C, with a high average monthly temperature of 20 °C in January to February, and a low average monthly temperature of 13 °C during June to August (Schulze, 2009).

Geology of the area consists of calcareous aeolianite of the Waenhuiskrans Formation, partially covered by sand and coastal dunes of the Strandveld Formation, Bredasdorp Group (ENPAT, 2021). Soils are characterised by limited pedological development in the soil profile, which is typical of recent floodplains. Soils within the development area are greyish, regic sands which are excessively drained (**Table 4-1**).

The surrounding natural terrestrial vegetation, where present, consists of the Overberg Dune Strandveld. The Overberg Dune Strandveld vegetation type is listed as Endangered (EN) on the revised list of ecosystems that are threatened and is classified as Well Protected (WP). The natural wetland vegetation, where wetlands are present, comprises South Strandveld Western Strandveld (**Figure 4-2**) (CSIR, 2011) which is listed as Endangered (EN) on the revised list of ecosystems that are threatened and is classified as Zero Protected (WP)- Moderately protected (MP) depending on wetland type.

According the NFEPA (CSIR, 2011) and NWM5 (SANBI, 2018) dataset, there are no mapped wetlands indicated within the study area or within the 500 m regulated proximity (**Figure 4-3**). Furthermore, according to the NGI River line vector data (2019) there are mapped no rivers or drainage lines within the study area or within the 100 m regulated proximity thereof (**Figure 4-3**).

Table 4-1: General biophysical characteristics of the proposed study area.

Site attribute	Description	Data source
Eco-region	Southern Coastal Belt	Department of Water Affairs Level 1 Ecoregions (Department of Water and Sanitation, 2011)
Terrestrial Vegetation Type	Overberg Dune Strandveld (EN & WP)	National Vegetation Map of South Africa, 2018 (SANBI, 2018)
Dominant Geology and Soils	Calcareous aeolianite of the Waenhuiskrans Formation, partially covered by sand and coastal dunes of the Strandveld Formation, Bredasdorp Group. Soils consist of grey regic sands which are excessively drained.	Cape Farm Mapper (ENPAT, 2021)
Soil Erodibility Factor (K)	0.63 (High Erodibility)	SA Atlas of Climatology and Agrohydrology (Schultz, 2009)
Soil Depth & Clay Percentage (%)	>= 750 mm & < 15 %	Soil types and descriptions for the Western Cape, Department of Agriculture, Forestry and Fisheries (DAFF, 2021)
Mean Annual Precipitation (mm)	512 mm	SA Atlas of Climatology and Agrohydrology (Schultz, 2009)
Rainfall seasonality	Winter rainfall	
Mean Annual Temperature (°C)	16.10 °C	
Water Management Area (WMA)	Breede-Olifants WMA	Water Management Areas (DWS, 2023)
Quaternary Catchment	G40L	South African Quaternary Catchments Database (Schulze et al., 2007)
Wetland Ecosystem Type	South Strandveld Western Strandveld (EN & ZP-MP)	NFEPA Wetland Ecosystem Types (CSIR, 2011)

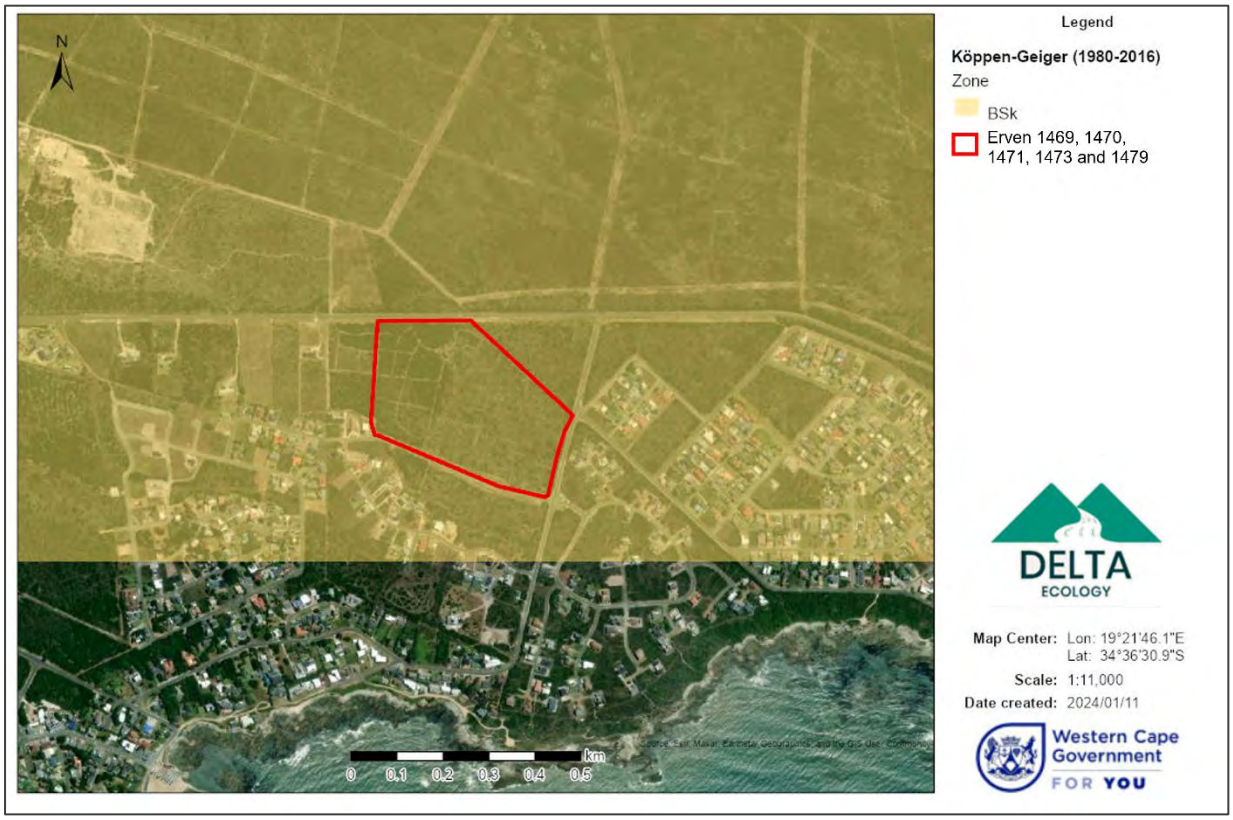

Figure 4-1: Beck et al. (2018) Köppen-Geiger climate zones for present day.

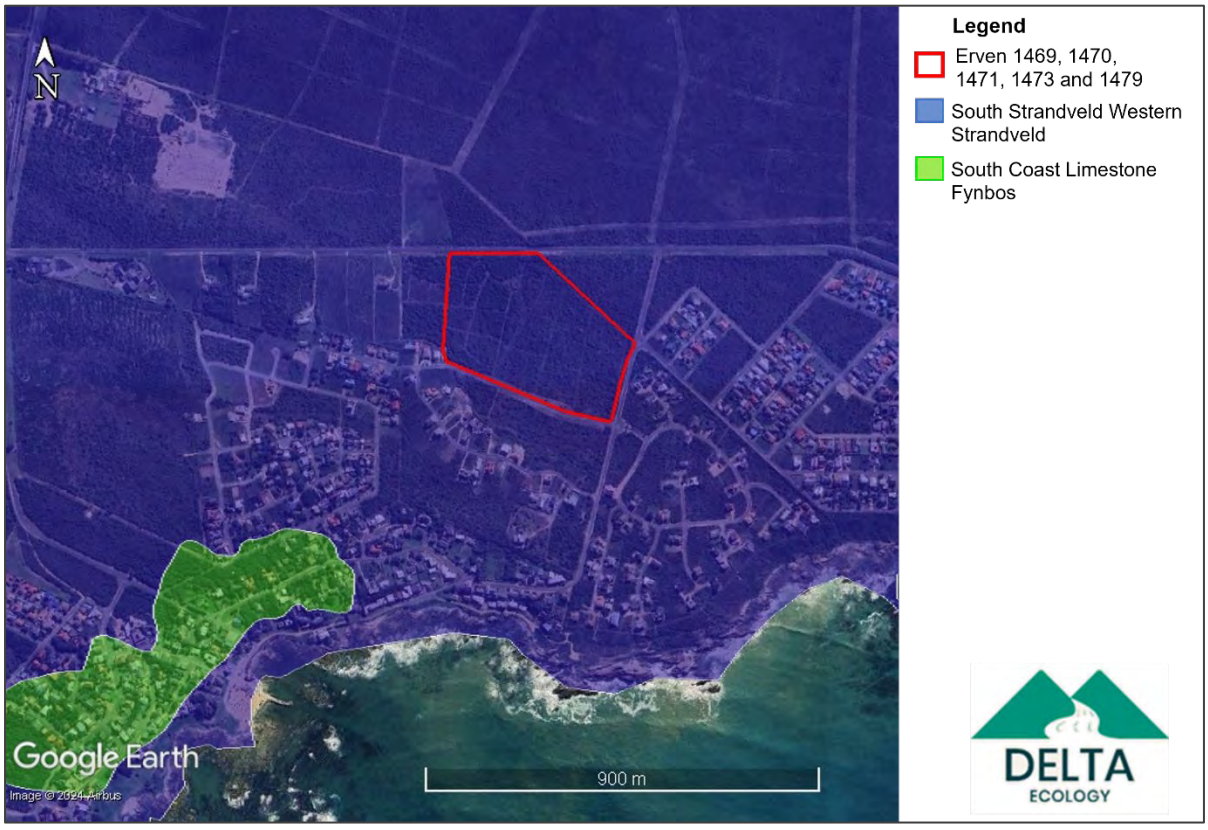

Figure 4-2: Natural wetland vegetation would have consisted of the South Strandveld Western Strandveld.

Figure 4-3: No mapped NFEPA (CSIR, 2011), NWM5 (SANBI, 2018), NGI (2019) or drainage line watercourses indicated within the study area or 500 m thereof.

4.2. Biodiversity Planning Context

The proposed study area under evaluation lies within the Breede-Olifants WMA. The area does not intersect any Strategic Water Source Area for Surface Water (SWSA-sw) or Groundwater (SWSA-gw) (Le Maitre *et al*., 2018). The applicable sub-quaternary catchment is not demarcated as a Freshwater Ecosystem Priority Area (FEPA) (CSIR, 2011). In terms of delineated eco-regions for South Africa, this catchment falls within the Southern Coastal Belt eco-region (Level 1 Department of Water Affairs (DWA), now Department of Water and Sanitation) (**Table 4-1**).

According to the WCBSP (2017), the study area overlays mapped aquatic Ecological Support Areas 1 (ESA) and aquatic ESA 2s, both demarcated due to "Coastal Corridor, Watercourse" (**Figure 4-5**). However, no natural watercourses were found within the study area during the field assessment.

Additionally, mapped aquatic ESAs occur within the 500 m regulated area (**Figure 4-5**). These areas will not be impacted by the development, as Dyer Street separates the development area from the mapped ESAs.

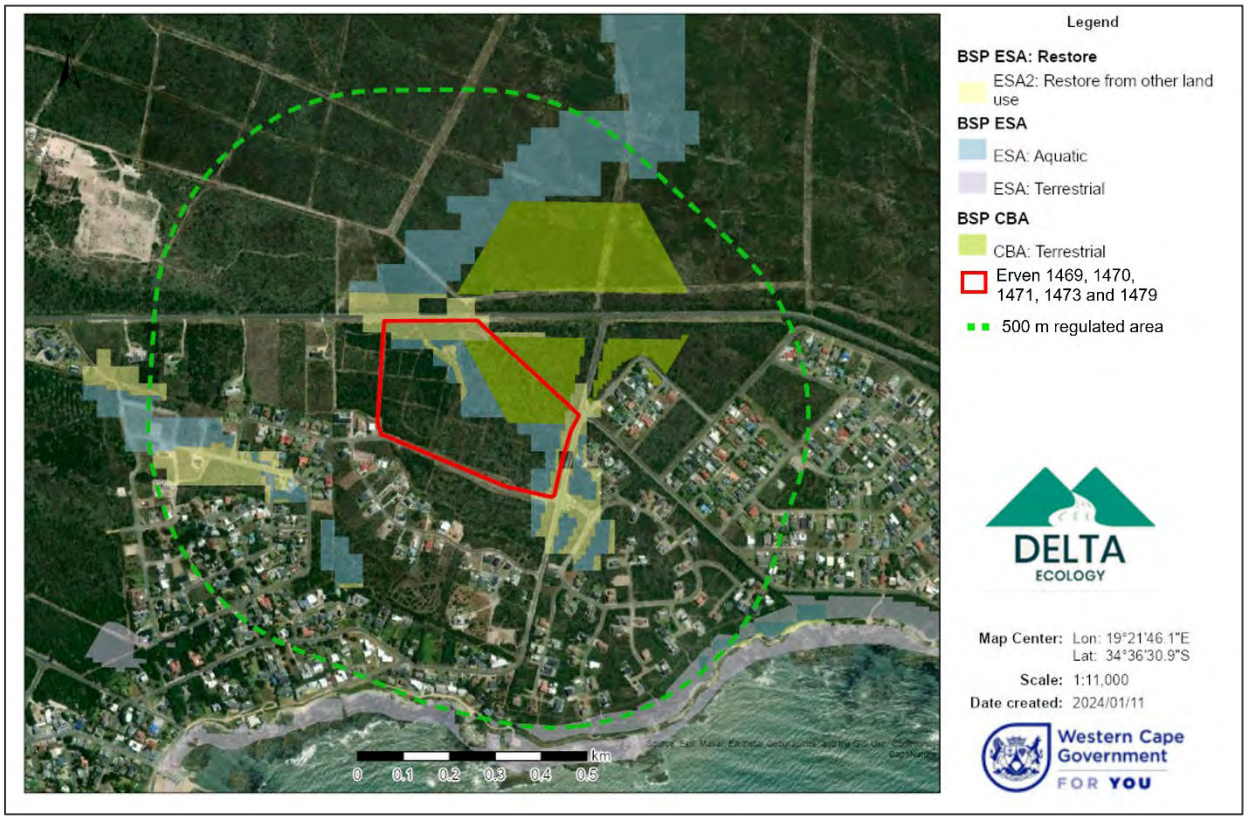

Figure 4-4: CBAs and ESAs (WCBSP, 2017) indicated within study area and 500 m thereof.

5. Site Description

The proposed development area (**Figure 5-1** to **Figure 5-6**) is located immediately south of Dyer Street, and north of Bosbok Street. The study area comprises a series of undulating sand dunes that slope in a south westerly direction toward the sea. The study area is surrounded by low density residential housing to the east and south, natural vegetation to the west, and Dyer Street to the north.

The majority of the study area consists of natural Overberg Dune Strandveld with some areas infested with alien invasive *Acacia cyclops* (Rooikrans Wattle trees). There is dirt tracks and firebreaks within the study area, along with a small, dilapidated building.

No watercourse conditions were present within the study area, i.e. no topographical (riverbed/channel or banks), hydric soils, hydrophytic or riparian vegetation. No criteria used to identify a watercourse as per the National Water Act (NWA) (Act 36 of 1998) were present within the study area.

Soil samples taken within the study area indicated well-drained, light brown to greyish sand. Dominant vegetation consisted of terrestrial species *Searsia lucida* (Blinktaaibos), *Searsia glauca*, *Satyrium carneum* (Pink Satyre), *Agathosma capensis* (Cape Buchu), and *Helichrysum patulum* (Honey Everlasting) among others. The alien invasive *Acacia cyclops* (Rooikrans Wattle) was also present within the study area.

Figure 5-1: Overview of the study area consisting of a gently undulating landscape.

Figure 5-2: Overview of onsite terrestrial vegetation.

Figure 5-3: Dirt track / service road observed within the study area.

Figure 5-4: Small, dilapidated building within the north of the study area.

Figure 5-5: Brown, sandy terrestrial soil within the study area.

Figure 5-6: Greyish sandy terrestrial soil within the study area.

6. Conclusion and Recommendation

This report sets out the results from a desktop analysis, as well as a field assessment, to clarify aquatic biodiversity constraints associated with the proposed Residential Development on Erven 1469, 1470, 1471, 1473 and 1479, Van Dyksbaai, Overstrand Municipality.

During the desktop assessment, it was determined that there were no mapped rivers, or natural / artificial wetlands within the proposed study area, or within 500 m thereof, according to the NWM5 (SANBI, 2018), the NFEPA spatial data (CSIR, 2011), as well as the topographical and watercourse information from the DRDLR. According to the WCBSP (2017), the study area overlays mapped aquatic ESA1 and ESA 2s demarcated due to "Coastal Corridor, Watercourse".

After the field assessment, it was determined that there were no watercourse conditions present within the study area, i.e. no topographical (riverbed/channel or banks), hydric soils, hydrophytic or riparian vegetation. No criteria used to identify a watercourse as per the National Water Act (NWA) (Act 36 of 1998) were present within the study area.

Soil samples taken from various locations within the study area indicated well-drained, light brown to greyish sand. Dominant vegetation consisted of terrestrial species *Searsia lucida* (Blinktaaibos), *Searsia glauca* (Blue Kunirhus), *Satyrium carneum* (Pink Satyre), *Agathosma capensis* (Cape Buchu) and *Helichrysum patulum* (Honey Everlasting) among others. The alien invasive *Acacia cyclops* (Rooikrans Wattle) was also present within the study area.

The study area was deemed to be of "Low" aquatic sensitivity given the lack of watercourses present. From an aquatic ecological perspective, there should be no reason the proposed Residential Development cannot be approved.

7. References

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