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15 June 2022

Sharples Environmental Services
ATTN: John Sharples
By email: john@sescc.net

Dear John

RE: Wetland scan of portion of site for proposed residential development at Muishondbaai, Stilbaai West, Hessequa Municipality, Western Cape

Background and terms of reference

Residential development of portions of interlinked Erven 4139, 4140. 4142 and 4143 at Muishondbaai in Stilbaai West is proposed. Sharples Environmental Services cc (SES) was appointed by the landowner to coordinate the application for Environmental Authorisation required in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended, published under the National Environmental Management Act (Act No. 107 of 1998) (NEMA). As part of this process, SES applied the national web-based environmental Screening Tool prescribed by the Department of Forestry, Fisheries & the Environment (DFFE) for all Environmental Authorisation applications[1] to the proposed development. According to the Screening Report that was generated, the proposed development falls within an area of "Low" sensitivity for aquatic biodiversity. However, due to the National Wetland Map (Version 5) indicating that a wetland is located near the proposed development site (on a portion of one of the erven making up the site), it was required that the Low sensitivity rating must be confirmed or disputed by an aquatic specialist, through completion of a Site Sensitivity Verification.

In June 2021, an Aquatic Biodiversity Verification Assessment was completed for the proposed development by Ms Fordham of SES[2]. This specialist study found that no wetland is present on the site and that the National Wetland Map is thus incorrect for this area, verifying that the initial designation of "Low" sensitivity for aquatic biodiversity through application of the national Screening Tool was valid. As such, the submission of an Aquatic Biodiversity Compliance Statement was deemed to be applicable and was included as part of the Aquatic Biodiversity Verification Assessment report compiled by the SES aquatic specialist.

It is understood that, due to regulatory technicalities, the findings of the Aquatic Biodiversity Verification Assessment and Compliance Statement that was completed by SES requires verification by an appropriately qualified specialist who is registered as a Professional Natural Scientist (*Pr.Sci.Nat.*) with the South African Council for Natural Scientific Professions (SACNASP). Dean Ollis of Inland Waters Consultancy was subsequently appointed by SES, as a suitably qualified and SACNASP-registered aquatic specialist (see appended Curriculum Vitae). The terms of reference for my input into this project were exclusively to visit the relevant portion of the proposed development site and confirm that there are no wetlands present, as previously determined by Ms Fordham of SES, and to present my findings in a letter-report.

[1] Available: https://screening.environment.gov.za/screeningtool/index.html

[2] Fordham D (2021). Aquatic Biodiversity Verification Assessment for the proposed consolidation, subdivision and rezoning of Erven 4139, 4140, 4141, 4142, 4143, 4144, 4145 (Erf 3997), Still Bay West. Report prepared by Sharples Environmental Services for Mr Willem Nel.

Location and biophysical context

The proposed development site is located on four undeveloped erven at Muishondbaai in Stilbaai West, along the south coast of the Western Cape within the Hessequa Municipality (see locality map in **Figure 1**). The Goukou River enters the sea via an extensive estuary approximately 3 km to the north-east of the site.

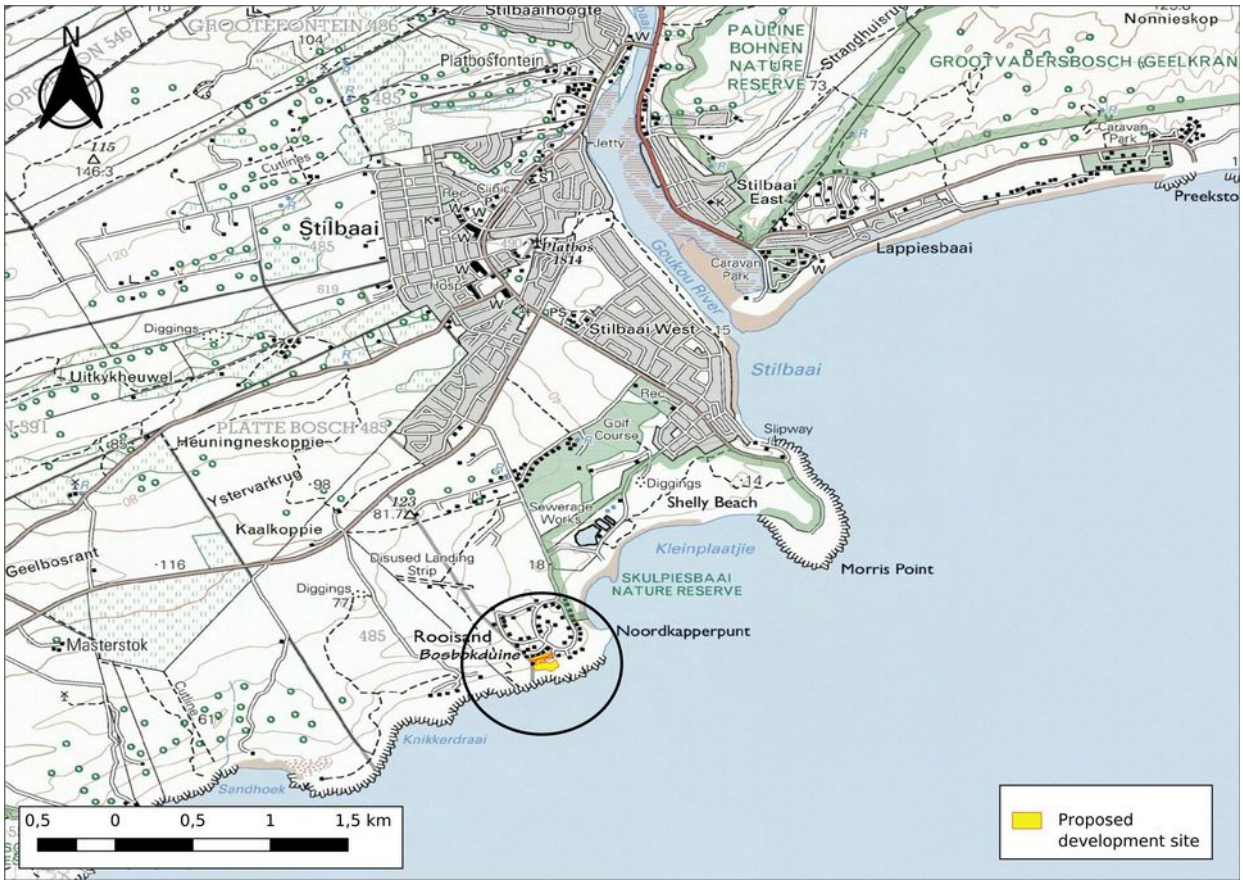

Figure 1: Locality Map for the proposed development site at Muishondbaai, Stilbaai West

The site is located in the Southern Coastal Belt Aquatic Ecoregion[3], within Quaternary Catchment H80F of the Gouritz Water Management Area according to the delineation of broad catchments by the Department of Water & Sanitation (DWS). According to the relevant 1:250 000 scale geology map of the study area (3420 Riversdale), as produced by the Council for Geoscience, the proposed development site is located in an area dominated by unconsolidated dune sands of the Strandveld Formation at the surface, with Quaternary light grey to red sandy soils occurring at the surface further inland, and calcarenite and calcareous sandstone associated with the Wankoe Formation at the surface further inland from that (see map in **Figure 2**). Underlying these surface sediments is a layer of quartzitic sandstones of the Peninsula Formation, which crops out at the coastline to the south of the site.

The dominant soil types in the study area, according to spatial information for the Western Cape from the national Department of Agriculture, Forestry and Fisheries on the Cape Farm Mapper website[4] (hosted by the Western Cape Department of Agriculture), are greyish, sandy excessively drained soils with limited pedological development.

[3] After: Kleynhans CJ, Thirion C and Moolman J (2005). A Level I River Ecoregion classification System for South Africa, Lesotho and Swaziland. Report No. N/0000/00/REQ0104. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria.

[4] Available: https://gis.elsenburg.com/apps/cfm/

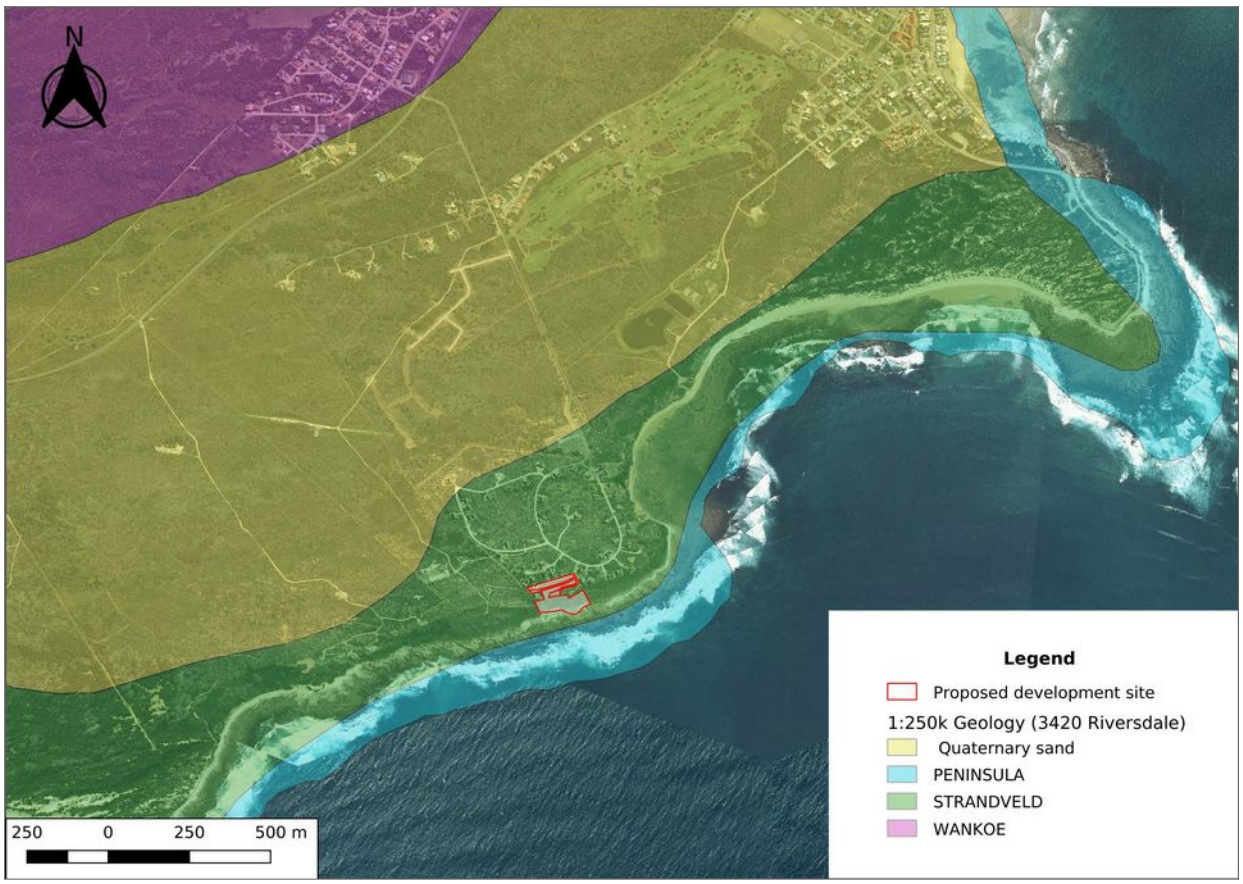

Figure 2: Map showing the dominant geology of the study area, as delineated by the Council for Geoscience at a scale of 1:250 000 (map sheet 3420 Riversdale)

The 2018 version of the National Vegetation Map[5] indicates that the broader study area is dominated by Hartenbos Dune Thicket. This recently added vegetation type has been categorised as a Least Threatened terrestrial ecosystem type, according to the results of the National Biodiversity Assessment 2018 (NBA-2018)[6]. The description provided for this vegetation type[7] indicates that it occurs on flat to moderately undulating coastal dunes. It consists of "a mosaic of low (1 - 3 m) thicket, occurring in small bush clumps dominated by small trees and woody shrubs, in a mosaic of low (1 - 2 m) asteraceous fynbos. Thicket clumps are best developed in fire-protected dune slacks, and the fynbos shrubland occurs on upper dune slopes and crests". In terms of geology and soils, Hartenbos Dune Thicket predominantly occurs in Wankoe and Strandveld Formations, and the most important land types[8] are "Fc, Hb, Ha". According to information on the Cape Farm Mapper website, "Ha" and "Hb" Land Types are typically dominated by grey regic (i.e. unconsolidated) sands.

The broader site where development is proposed consists of a naturally terraced topography, with an upper platform sloping down to a lower but less level platform, abutted by a steep near-vertical drop-off to the south (seaward side) that extends to the coastal platform. The botanical assessment that was completed by Paul Emms of Capensis Ecological Consulting[9] indicated that the portions of the site on the steep drop-off and the lower coastal platform contain intact vegetation, with the exception of an unused vehicle track (or old fire-break) where vegetation is slowly recovering. The intact vegetation consists of a mix of strandveld and dune thicket dominated by dense but low

[5] South African National Biodiversity Institute (2006-2018). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, http://bgis.sanbi.org/Projects/Detail/186, Version 2018.

[6] Skowno AL, Raimondo DC, Poole CJ, Fizzotti B and Slingsby JA (eds.) (2019). South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

[7] Available: http://bgis.sanbi.org/Projects/Detail/208

[8] A land type is an area with a marked degree of uniformity with regard to terrain form, soil pattern and macro climate.

[9] Emms P (2021). Botanical Assessment: Proposed residential development at Muishondbaai, Stillbaai West, Hessequa Municipality, Western Cape. Prepared by Capensis for Sharples Environmental Services, January 2021.

milkwoods (*Sideroxylon inerme*), which transitions to seashore vegetation extending seawards towards the High Water Mark.

It is on the narrow coastal platform with milkwood-dominated dune thicket where National Wetland Map Version 5 (NWM5), produced as part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAS)[10], and the 2017 Western Cape Biodiversity Spatial Plan (WCBSP)[11] indicated on the basis of desktop mapping that there is a wetland (see map in **Figure 3**).

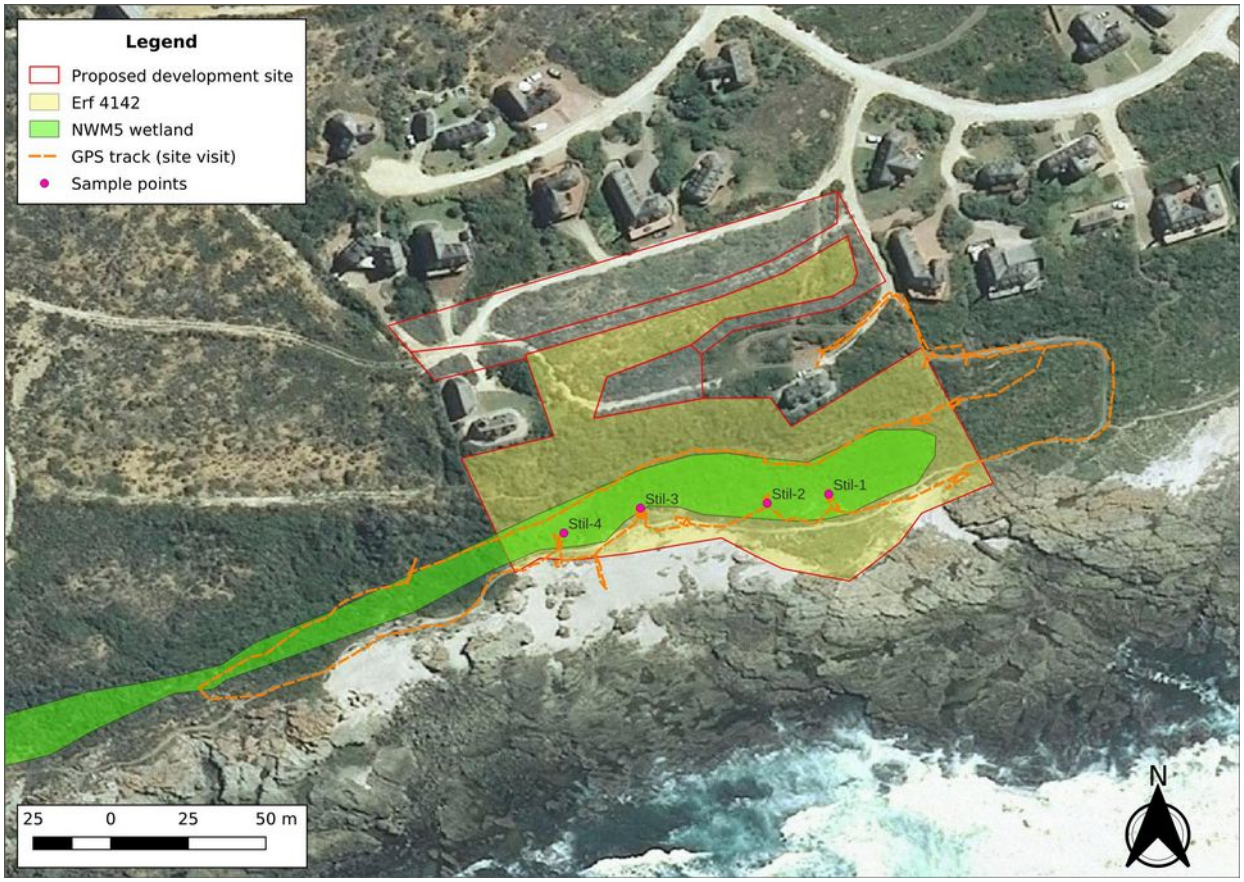

Figure 3: Map showing the proposed development site (Erf 4142 in particular) in relation to the wetland delineated on a desktop-basis by National Wetland Map 5 (NWM5). GPS track and sample points from site visit by Inland Waters Consultancy are also shown on the map.

Approach taken and limitations

The approach taken to conducting the current study was to complete the following tasks:

- Available background information and documentation was reviewed, including the Aquatic Biodiversity Verification Assessment by SES (Fordham 2021) and the Botanical Assessment by Capensis (Emms 2021).
- Potentially relevant desktop-based maps were consulted to verify what wetlands and other watercourses have been mapped on and adjacent to the proposed development site. These included NWM5, the WCBSP-2017 maps (for Hessequa Municipality), the maps from the National Freshwater Ecosystems Priority Areas (NFEPA) project and the 1:50 000 scale topographical maps produced by the Chief Directorate: National Geospatial Information (NGI).
- Recent aerial imagery from NGI and Google Earth was reviewed to determine whether any potential wetland areas or other freshwater ecosystems are observable on or adjacent to the site.

[10] Van Deventer H, Smith-Adao L, Mbona N, Petersen C, Skowno A, Collins NB, Grenfell M, Job N, Lötter M, Ollis D, Scherman P, Sieben E and Snaddon K (2018). South African National Biodiversity Assessment 2018: Technical Report. Volume 2a: South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Version 3, final released on 3 October 2019. CSIR report number CSIR/NRE/ECOS/IR/2018/0001/A. South African National Biodiversity Institute, Pretoria.

[11] Pool-Stanvliet R, Duffell-Canham A, Pence G and Smart R (2017). The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

- A site visit was undertaken (on 30 March 2022) to verify in the field whether any wetlands or other freshwater ecosystems are present on the lower portion of the site.
- A number of maps were produced and the current letter-report was compiled to summarise my findings.

The presence//absence of wetlands was determined during the site visit by following standard field-based procedures for the identification and delineation of wetlands, as prescribed by DWS[12], which are based on the observation of landscape setting, landform, vegetation and soil moisture characteristics (using a soil auger to check the soil for signs of permanent or periodic saturation at selected points). The definition of "wetland" adopted for this investigation was that of the National Water Act (Act No. 36 of 1998), whereby a wetland is defined as "*land which is transitional between terrestrial and aquatic systems, where the water table is usually at, or near the surface, or the land is periodically covered with shallow water and which land in normal circumstances supports, or would support, vegetation adapted to life in saturated soil*."

It is important to note that the study was limited to a wetland scan of the lower portion of the proposed development site on the coastal platform. The higher-lying portions of the site were not investigated and no assessments of the potential impacts on freshwater ecosystems that could result from the proposed project were undertaken.

Findings of the investigation

The desktop-based analysis of maps and aerial imagery confirmed that NWM5 did indicate a wetland on the lower portion of the site, which was classified by the NWM5 project as a seep wetland[13] on a desktop-basis. It was also confirmed that this same wetland area was included as an Aquatic Ecological Support Area (ESA) on the maps produced by WCBSP-2017, simply classified as a wetland feature. A review of the maps produced by the 2011 NFEPA project revealed that the wetland was originally mapped by this initiative, and then carried forward into the more recent national and regional spatial conservation planning projects. The NFEPA project classified the wetland as an unchannelled valley-bottom wetland, as opposed to a seep, and identified it as a Freshwater Ecosystem Priority Area (FEPA). No obvious wetlands or other freshwater ecosystem features were, however, clearly visible on available aerial imagery that was analysed, which instead indicated that thicket vegetation appears to be dominant in the study area. This analysis suggested it is unlikely that extensive wetlands (as mapped by NWM5 and other national/regional spatial planning initiatives) are present on the lower portion of the proposed development site.

The field observations I made during my site visit confirmed that the focal study area (i.e. the lower portion of the proposed development site) is indeed covered by milkwood-dominated terrestrial thicket vegetation (e.g. see photos in **Figure 4**), as previously verified by botanical and aquatic ecosystem specialists.

The auger data that I collected (see **Table 1**) confirmed that, at all four points that were sampled in the area mapped as a wetland by NWM5, the soils consist of well-drained regic sands with no hydromorphic properties (such as low-chroma matrix or the presence of mottles) (e.g. see photos in **Figure 5**), mostly overlying a hard rock layer generally less than 1 m below the surface. This is consistent with the dominant geology and land types in the area. No wetland plants were observed at the soil auger points, or anywhere else in the focal study area, which was instead dominated by terrestrial thicket vegetation as previously indicated.

[12] After: Department of Water Affairs and Forestry [DWAF] (2005). A Practical Field Procedure for Identification and Delineation of Wetlands and Riparian Areas. Department of Water Affairs and Forestry, Pretoria.

[13] After: Ollis DJ, Snaddon CD, Job NM and Mbona N (2013). Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African National Biodiversity Institute, Pretoria.

Figure 4: Photographs showing the milkwood-dominated dune thicket in the focal study area

Table 1: Soil and vegetation data collected from sampling points (see point locations on map in Figure 3)

Sample point	Soil					Vegetation	Notes
	Depth range (cm)	Texture	Colour	Hydromorphic indicators	Wetness		
Stil-1	0-25	Sand (with shells)	Reddish-brown	None	Slightly damp	- *Lycium ferocissimum* - *Sideroxylon inerme* (milkwood) nearby	Well-drained, coarse beach sand on top of rock in coastal thicket
	25-40	Coarse sand (with shells)	Grey-white and brown	None	Dry		
	@40	Rock	n/a	n/a	n/a		
Stil-2	0-10	Fibrous layer	Dark brown	n/a	Dry	- *Lycium ferocissimum* - *Sideroxylon inerme* (milkwood)	Well-drained, coarse beach sand on top of rock in coastal thinket
	10-25	Saand (with shells)	Reddish-brown	None	Dry		
	25-30	Coarse sand	Grey-white and brown	None	Dry		
	@30	Rock	n/a	n/a	n/a		
Stil-3	0-3	Sand	Reddish brown	None	Saturated	- *Lycium ferocissimum* - *Sideroxylon inerme* (milkwood) - *Searsia* sp.	Well-drained, coarse beach sand in coastal thicket
	3-120	Coarse sand (with shells)	Grey-white and brown	None	Dry		
Stil-4	0-3	Fibrous layer	Dark brown	n/a	Dry	- *Osteospermum monilifera* (Bitou) - *Sporobolus vriginicus* (seashore dropseed)	Deeper layer of finer sand in more open, disturbed patch
	3-30	Fine sand	Reddish brown	None	Dry		
	30-50	Sand	Dark brown	None	Slightly damp		
	50-60	Coarse sand	Grey-white and brown	None	Dry		
	@60	Rock	n/a	n/a	n/a		

Figure 5: Photographs of coarse sandy soils (with shell fragments) at some of the sample points

Conclusions

The main conclusion of my investigation was that there are no wetlands or other watercourses on the lower (coastal platform) portion of the proposed development site. The area is characterised by the occurrence of well-drained regic sands above an underlying rock layer, and terrestrial dune thicket vegetation dominated by milkwoods. This supports the previous conclusions made by the SES aquatic specialist (Fordham 2021). As such, it is verified that the Low Sensitivity rating for aquatic biodiversity that was generated by the DFFE Screening Tool for the proposed development is valid.

I trust that the information presented in this letter-report is sufficient for the freshwater ecology input required at this stage of the application process. If there are any queries about my findings, please do not hesitate to contact me.

Yours sincerely

Dean Justin Ollis *Pr.Sci.Nat.*

Appendices included with this letter:

- CV of specialist (Dean Ollis of Inland Waters Consultancy)

ABBREVIATED CURRICULUM VITAE: DEAN OLLIS

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Cell:	072 377 7006
E-mail:	dean@inlandwaters.co.za
Nationality:	South African
Date of birth:	3 August 1973
Marital status:	Married with two children

UNIVERSITY QUALIFICATIONS:

- B.Sc, University of Cape Town (UCT) - 1996
- B.Sc Hons (Ocean & Atmosphere Science), First Class, UCT - 1997
- M.Phil (Environmental Science), UCT - 2000
- M.Sc (Ecological Assessment), with Distinction, Stellenbosch University - 2004

KEY WORK EXPERIENCE:

Mar 2019 – present: - Owner of Inland Waters Consultancy (sole proprietorship);
- Research Associate: Freshwater Research Centre NPC.

2012 – 2019: - Member of Freshwater Consulting cc;
- Associate of Freshwater Research Centre NPC.

2007 – 2012: - Member of Freshwater Consulting cc;
- Research Associate: Freshwater Research Unit, UCT.

2004 – 2006: - Course coordinator (part-time): 3rd Year undergrad semester course on Inland Water Ecosystems (Zoology Dept, UCT);
- Private Consultant.

2002 – 2004: - Private Consultant (part-time);
- M.Sc. student: University of Stellenbosch.

2000 – 2003: - Environmental Consultant: Knight Hall Hendry (Pty) Ltd.

SUMMARY OF RELEVANT EXPERIENCE:

Approximately 20 years of experience in the environmental sciences, with just under 15 years specialising in aquatic (freshwater) science. Work experience includes:

- Specialist aquatic ecology input into environmental impact assessments;
- Water quality and aquatic ecosystem situation assessments;
- River and wetland “health” assessments;
- Coordination of development of a national wetland classification system for South Africa;
- Coordination of undergraduate course in Freshwater Ecology at University of Cape Town;
- Delivering lectures to university students;
- Coordination of development of short course modules in Integrated Environmental Water Management;
- Assistance with the running of training courses (e.g. SASS5 aquatic invertebrate assessment method);
- Co-supervision of Honours and Masters students with projects relating to Freshwater Ecology;
- Reviewing of consulting reports and academic papers;and
- Delivery of presentations at international and national conferences.

PROFESSIONAL SOCIETIES:

1. Certified Professional Natural Scientist (*Pr.Sci.Nat.*) with South African Council for Natural Scientific Professions (SACNASP).
2. Member of Southern African Society of Aquatic Scientists (SASAqS).
3. Member of International Association for Impact Assessment, South Africa (IAIAsa).
4. Member of South African Wetland Society.

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AQUATIC BIODIVERSITY VERIFICATION ASSESSMENT

FOR THE PROPOSED

CONSOLIDATION, SUBDIVISION AND REZONING OF ERVEN 4139, 4140, 4141, 4142, 4143, 4144, 4145 (ERF 3997), STILL BAY WEST

PREPARED FOR:
Mr. Willem Nel
8 Nautilus Lane
GEORGE
6530

PREPARED BY:
Debbie Fordham
Aquatic Ecologist
Sharples Environmental Services cc
Email: debbie@sescc.net

DATE: 21 June 2021

AQUATIC TEAM

Debbie Fordham, the main author of this report, is in agreeance with the 'Declaration of Independence'.

SPECIALIST	QUALIFICATIONS	DETAILS
DEBBIE FORDHAM AQUATIC ECOLOGIST	M.Sc. - Environmental Science BA (Hons) - Environmental Science BA - Environmental Science and Geography	Debbie is a qualified aquatic ecologist and environmental scientist. Debbie holds a BA (Environmental Science and Geography), BA (Hons) and M.Sc. in Environmental Science from Rhodes University. She was awarded her Master of Science degree, by thesis, in Wetland Science, entitled: The origin and evolution of the Tierkloof Wetland, a peatland dominated by *Prionium serratum* in the Western Cape. She has specialised in aquatic habitat assessment and has produced numerous aquatic habitat impact assessment reports. She is well established in her specialist field and has worked in various provinces within South Africa.
DR BRIAN COLLOTY (COLLABORATING SCIENTIST)	(PR SCI NAT 400268/07) ❖ B.Sc. Degree (Botany & Zoology) - NMMU ❖ B.Sc. Hon (Zoology) - NMMU ❖ M.Sc. (Botany - Rivers) - NMMU ❖ PhD (Botany – Estuaries & Mangroves) – NMMU	Ecologist & Environmental Assessment Practitioner (Pr. Sci. Nat. 400268/07). Member of the South African Wetland Society. 25 years' experience in environmental sensitivity and conservation assessment of aquatic and terrestrial systems inclusive of Index of Habitat Integrity (IHI), WET Tools, Riparian Vegetation Response Assessment Index (VEGRAI) for Reserve Determinations, estuarine and wetland delineation throughout Africa. Countries include Mozambique, Kenya, Namibia, Central African Republic, Zambia, Eritrea, Mauritius, Madagascar, Angola, Ghana, Guinea-Bissau and Sierra Leone. Professional Natural Scientist (Pr.Sci.Nat) in Ecology – The South African Council for Natural Scientific Professions (SACNASP)

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REPORT CONTENT REQUIREMENTS CHECKLIST

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

Site sensitivity verification & report content requirements	**Ref to report content:**
Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the screening tool must be confirmed by undertaking a site sensitivity verification.	***Section 1.2 – Screening Tool Results***
The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.	***See 'Aquatic Team' info above and Section 10 - CV of specialist***
The site sensitivity verification must be undertaken through the use of:	
(a) a desk top analysis, using satellite imagery;	***Section 2.1 – Desktop Assessment Methods, and Section 4 – Desktop Assessment results***

(b) a preliminary on-site inspection; and	***The site inspection conducted on 20th of May 2021***
(c) any other available and relevant information.	***Such as Section 1.1 – Location and background and 1.3 – Relevant Legislation***
The outcome of the site sensitivity verification must be recorded in the form of a report that:	
(a) confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;	***Section 5 – Site Verification, and Section 6 - Compliance Statement***
(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and	***Section 5 – Site Verification***
(c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.	***Confirmed***

Aquatic Biodiversity Compliance Statement contains, as a minimum, the following information:	**Ref to report content:**
a. Contact details and curriculum vitae of the specialist;	***Section 10 - CV of specialist***
b. A signed statement of independence by the specialist;	***Section 9 – Specialist Declaration of Independence***
c. Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	***Section 4 – Desktop Assessment results*** ***Section 2.1 – Desktop Assessment Methods*** ***Section 3 - Assumptions and Limitations***
d. Methodology used to verify the sensitivities of the aquatic biodiversity features on the national web based environmental verification tool;	***Section 2 - Approach and methods*** ***2.1 - Desktop assessment methods***
e. Methodology used to undertake the Initial Site Sensitivity Verification and preparation of the Compliance Statement, including equipment and modelling used, where relevant;	***Section 2 - Approach and methods*** ***2.2 - Site assessment methods***
f. Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	***Section 6 – Compliance Statement***
g. 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; and any conditions to which the statement is subjected.	***Section 3 - Assumptions and Limitations*** ***Section 7 - Conclusion***

1 INTRODUCTION

Sharples Environmental Services cc (SES) has been appointed by Mr Nel to conduct a Site Verification assessment for the residential development of erven at Muishondbaai in Stillbaai, in order to produce the Aquatic Biodiversity Compliance Statement, as required by DEA&DP.

1.1 Location and background

The study area is located in Stillbaai within the Hessequa Municipality (Figure 1). The Goukou River divides the town into Stillbaai East and Stilbaai West. The site is located in Stillbaai West at Muishondbaai, which lies immediately adjacent to and south-west of Skulpiesbaai Local Nature Reserve and the coast. The landowner of Erven 4139, 4142, 4143 and 4140 intends developing a portion of their properties at Muishondbaai in Stillbaai (Figure 2).

Figure 1: Location of the proposed development site in relation to the town of Still Bay

Figure 2: Map showing the boundary of the erven proposed for development

1.2 Screening Tool Results

The National Web based Environmental Screening Tool was utilized for this proposal in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended, to screen the proposed site for any environmental sensitivity. Screening Tool identifies related exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site. The Screening Tool allows for the generating of a Screening Report referred to in Regulation 16 (1) (v) of the Environmental Impact Assessment Regulations 2014, as amended whereby a Screening Report is required to accompany any application for Environmental Authorisation. Requirements for the assessment and reporting of impacts of development on aquatic biodiversity are set out in the 'Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity published in Government Notice No. 648, Government Gazette 45421, on the 10 of May 2019.

According to the Screening Report, the proposed development falls within an area of “Low” aquatic sensitivity. However, national spatial data indicates a wetland near the proposed development site and thus the Low sensitivity rating must be confirmed or disputed by an aquatic specialist. This requires that the specialist undertakes an Initial Site Sensitivity Verification. Following this, if specialist assessment confirms the designation of “Low” aquatic biodiversity sensitivity from the national web

based environmental screening tool, this Aquatic Biodiversity Compliance Statement is required to be compiled.

1.3 Relevant Legislation

The protection of water resources is essential for sustainable development and therefore many policies and plans have been developed, and legislation promulgated, to protect these sensitive ecosystems. The proposed project must abide by the relevant legislative requirements. Table 1 below shows an outline of the environmental legislation relevant to the project.

Table 1: Relevant environmental legislation

Legislation	Relevance
South African Constitution 108 of 1996	The constitution includes the right to have the environment protected
National Environmental Management Act 107 of 1998	Outlines principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state.
Environmental Impact Assessment (EIA) Regulations	The 2014 regulations have been promulgated in terms of Chapter 5 of NEMA and were amended on 7 April 2017 in Government Notice No. R. 326. In addition, listing notices (GN 324-327) lists activities which are subject to an environmental assessment.
The National Water Act 36 of 1998	Chapter 4 of the National Water Act addresses the use of water and stipulates the various types of licensed and unlicensed entitlements to the use of water. Also, according to the Department of Water and Sanitation (DWS), any structures within a 500-metre radius from the boundary of a wetland constitutes a Section 21(c) and (i) water use and as such requires a water use licence.
General Authorisations (GAs)	Any uses of water which do not meet the requirements of Schedule 1 or the GAs, require a license which should be obtained from the Department of Water and Sanitation (DWS). Government Notice R509 of 2016 was issued as a revision of the General Authorisations (No. 1191 of 1999) for section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA. Determining if a water use licence is required is associated with the risk of impacting on that

	watercourse. A low risk of impact could be authorised in terms of a General Authorisations (GA).
National Environmental Management: Biodiversity Act No. 10 of 2004	This is to provide for the management and conservation of South Africa's biodiversity through the protection of species and ecosystems; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; and the establishment of a South African National Biodiversity Institute.
National Environmental Management: Integrated Coastal Management (Act 24 of 2008)	DEA: Chief Directorate: Oceans and Coast is the lead agent for the ICM Act. In relation to the establishment of resource objectives, the Act aims to establish a system of integrated coastal and estuarine management in South Africa. This includes setting the norms, standards and policies for management, promoting the conservation of the coastal environment and ensuring the ecologically sustainable development of the coastal zone. The Act also determines the responsible organs of state in relation to coastal areas to give effect to South Africa's international obligations in relation to coastal matters and to provide for related matters.

1.4 Scope of Work

1.4.1 Initial Site Sensitivity Verification

The Initial Site Sensitivity Verification was undertaken through the use of:

(a) a desk top analysis, using historical photographs and satellite imagery; and

(b) an on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web based environmental verification tool (Very high), such as new developments, infrastructure, indigenous/pristine vegetation, etc.

The outcome of the Initial Site Sensitivity Verification has been recorded in the form of a report that-

(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web based environmental verification tool;

(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

1.4.2 Aquatic Biodiversity Compliance Statement

The Aquatic Biodiversity Compliance Statement was prepared by a suitably qualified specialist in the field of aquatic sciences in order to verify:

a. That the site is of low sensitivity for aquatic biodiversity; and

b. Whether or not the proposed development will have an impact on the aquatic features.

The above is in terms of the latest NEMA Minimum Requirements and Protocol for Specialist Aquatic Biodiversity Impact Assessment as contained in the "*Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes of Section 45 (a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental Authorization*" (10 May 2020).

2 APPROACH AND METHODS

2.1 Desktop Assessment Methods

- The contextualization of the study area was undertaken in terms of important biophysical characteristics and the latest available aquatic conservation planning information in a Geographical Information System (GIS). It is imperative to develop an understanding of the regional drainage setting and longitudinal dynamics of the watercourses. The conservation planning information aids in the determination of importance and sensitivity, management objectives, and the significance of potential impacts.
- Following this, desktop delineation and illustration of all potential watercourses within the study area was undertaken utilising available site-specific data such as aerial photography, contour data and water resource data. Digitization and mapping were undertaken using QGIS 2.18 GIS software (Table 3).
- These results, as well as professional experience, allowed for the identification of specific areas that could potentially be impacted by the activities and therefore required groundtruthing and detailed assessment. The following data sources listed within Table 2 assisted with the assessment.

Table 2: Utilised data and associated source relevant to the proposed project

Data	Source
Google Earth Pro™ Imagery	Google Earth Pro™
DWS Eco-regions (GIS data)	DWS (2005)
South African Vegetation Map (GIS Coverage)	Mucina & Rutherford (2006-2018)
National Biodiversity Assessment Threatened Ecosystems (GIS Coverage)	SANBI (2018)

Geology	Council for Geoscience (2019)
Contours (elevation) - 5m intervals	Surveyor General
NFEPA river and wetland inventories (GIS Coverage)	CSIR (2011)
NEFPA river, wetland and estuarine FEPAs (GIS Coverage)	CSIR (2011)
Western Cape Biodiversity Framework 2017: Critical Biodiversity Areas of the Western Cape.	Pence (2017)
National Wetland Map 5	Van Deventer, et al. (2018)

2.2 Site Assessment Methods

- An infield site assessment was undertaken on the 20th of May 2021 to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web based environmental verification tool (Low), such as new developments, infrastructure, indigenous/pristine vegetation, etc.
- Infield assessment was undertaken to identify any aquatic ecosystems on the site, in alignment with standard field-based procedures in terms of the Department of Water and Sanitation (DWAF 2008) *Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas,* with a hand-held GPS, and a Dutch soil auger. The assessment is based upon observations of the landscape setting, topography, vegetation and soil characteristics (using a hand-held soil auger for the identification of any wetland soils).
- Following this, recommendations of any monitoring requirements for inclusion in the EMPr of the site based on sensitivity analysis were compiled.

3 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are relevant:

- Aquatic ecosystems vary both temporally and spatially. Once-off surveys such as this are therefore likely to miss certain ecological information due to seasonality, thus limiting accuracy and confidence. That said, the entire property was groundtruthed on foot, and the level of confidence in the findings is high.
- Infield soil and vegetation sampling was only undertaken within a specific focal area around the proposed site, while the remaining aquatic features were delineated at a desktop level.
- No detailed assessment of aquatic fauna/biota was undertaken.
- The vegetation information provided is based on observation not formal vegetation plots.
- While disturbance and transformation of habitats can lead to shifts in the type and extent of freshwater ecosystems, it is important to note that the current extent and classification is reported on here.

4 DESKTOP ASSESSMENT

The verification study was informed by the available datasets relevant to water resources, as well as historic and the latest aerial imagery, to develop an understanding of the fluvial processes of the study area. A significant amount of the latest spatial data has been provided through the products of the 2018 National Biodiversity Assessment (NBA). The NBA is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. It is used to inform policies, strategies and actions in a range of sectors for managing and conserving biodiversity more effectively. The desktop assessment findings were used to identify areas important for site investigation which require a more detailed level of infield verification study.

4.1 General biophysical characteristics

The study area is located within the H80F quaternary catchment and falls within the Gouritz Water Management Area. The northern boundary of the site reaches an elevation of 30 masl while the southern portion extends below the 5m contour line on the coastal platform. The vegetation of type of the site is described by the VEGMAP (SANBI 2018) as Hartenbos Dune Thicket (Least Threatened), while the WCBSP categorises the vegetation as Blombos Strandveld (also LT) (CapeNature, 2017).

4.2 South African Inventory of Inland Aquatic Ecosystems

The National Freshwater Ecosystem Priority Areas (NFEPA 2011) data provides strategic spatial priorities for conserving South Africa's aquatic ecosystems and supporting sustainable use of water resources. FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Driver *et al.* 2011). In 2018 the national wetland and river dataset, including the 2011 NFEPA data, was updated as part of the National Biodiversity Assessment (SANBI 2018). A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established and offers a collection of data layers pertaining to ecosystem types and pressures for both rivers and inland wetlands. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018. The South African National Wetlands Map (NWM) provides information on the location, spatial extent, and ecosystem types of estuarine and inland aquatic ecosystems (Van Deventer *et al.*, 2018).

According to the NWM5 data provided by the South African Inventory of Inland Aquatic Ecosystems (SAIIAE 2018) there is a seep wetland, on the coastal platform, within the property boundary (Figure 3). No rivers are indicated near the site.

Figure 3: The wetland data of the South African Inventory of Inland Aquatic Ecosystems (CSIR 2018)

4.3 Western Cape Biodiversity Spatial Plan

The Western Cape Biodiversity Spatial Plan (WCBSP) is recognised by both the Department of Environmental Affairs and South African National Biodiversity Institute. The primary purpose of a map of Critical Biodiversity Areas and Ecological Support Areas is to guide decision-making about where best to locate development. Critical Biodiversity Areas (CBA's) are required to meet biodiversity targets. These areas have high biodiversity and ecological value and therefore must be kept in a natural state without further loss of habitat or species. Low-impact, biodiversity sensitive land uses are the only land uses allowed in CBA's. Critically Endangered (CR) ecosystems, critical corridors for maintaining landscape connectivity and areas required to meet biodiversity pattern targets, are included in CBA's. The WCBSP made a distinction between areas likely to be in a natural condition (CBA1) and areas that could be degraded (CBA2). Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but are important as they support the functioning of CBA's and Protected Areas (PA's). ESA's support landscape connectivity, surrounds ecological infrastructure that provide ecosystem services, and strengthen resilience to climate change. These areas include Endangered vegetation; water source and recharge areas; and riparian habitat around rivers and wetlands. The WCBSP also made a distinction between ESA's in a functional condition (ESA1) and degraded areas in need of restoration (ESA2).

There is no CBA habitat mapped within the site. However, the majority of the site, especially the southern half, is mapped by the WCBSP as ESA 1 habitat (Figure 4). The ESA 1 area is further classified as Terrestrial and Aquatic. The ESA1 Aquatic area is described as 'wetland' and the extent of which is in alignment with the seep wetland area shown in the NWM5 map above. The reasons provided by the BSP for categorising these areas as ESA1 include 'Coastal Corridor' and 'Wetland'.

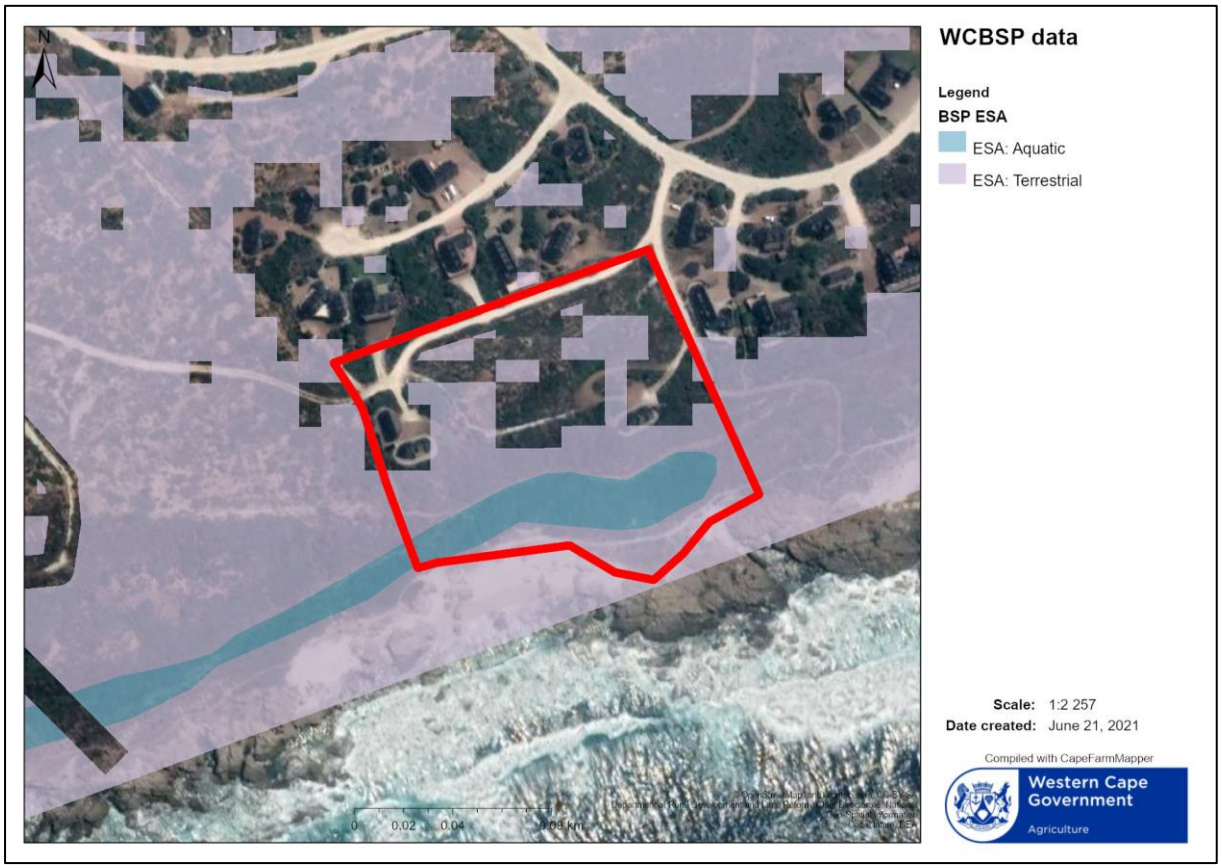

Figure 4: The study site in relation to features identified by the WCBSP (Pence, 2017).

5 SITE SENSITIVITY VERIFICATION

Although the Screening Report classified the site having as Low Sensitivity in the Aquatic Biodiversity theme, the desktop assessment found wetland habitat mapped by national datasets in the southern portion. Therefore, a site investigation was conducted to provide clarity on this discrepancy (Figure 5).

The study area consists of a naturally terraced topography, with an upper platform, which slopes down to a lower platform (area proposed for development), with steep near-vertical drop-off that extends to the coastal platform. The steep drop-off leads downslope to a mix of strandveld and milkwood thicket dominated by dense but low milkwood. At the base of the slope there is evidence of an unused vehicle track where vegetation is slowly reestablishing. The thicket habitat then transitions to seashore vegetation and extends to the Near-High Water Mark. The wetland habitat indicated on the

desktop maps was located within this narrow coastal platform area, which was therefore the focus of groundtruthing (Figure 5).

Figure 5: Site assessment conducted on the 20th of May 2021

It was determined that there are no watercourses located within the study area (Figures 6 – 8). The dense short milkwood thicket (which is relatively parallel to the slope) may have been incorrectly interpreted by remote modelling as wetland habitat, but none was observed on site. The entire area has sandy, well-drained soils and shows no signs of prolonged saturation, even temporary. The vegetation cover is uniform and comprises of terrestrial thicket species adapted to well-drained soils.

Figure 6: Photograph of the southern boundary of study area, looking west, showing the rocky shore and sandy beach in relation to the narrow coastal platform with short thicket terrestrial vegetation below the development site on top of the steep slope.

Figure 7: Photograph (a) of the site taken from the beach looking north, showing the uniform thicket vegetation on the sandy dune leading to a terrace upon which the development is proposed (b) of the uniform, sandy and well drained soils

Figure 8: Photograph of the foot of the slope, on the southern part of the site, where desktop data indicated the presence of a wetland, but no evidence was found.

6 COMPLIANCE STATEMENT

The site assessment findings can confirm the Low Sensitivity rating of the Screening Tool as accurate. No aquatic habitat was identified within the site and the development is not going to impact aquatic biodiversity. The aquatic biodiversity sensitivity rating for the area should remain 'Low' and a Compliance Statement is sufficient for this project.

7 CONCLUSION

Sharples Environmental Services cc were appointed to conduct an independent specialist aquatic verification assessment. All potential watercourses within the area of the site were identified, delineated, and investigated infield. No aquatic habitat was identified within the study area. The assessment has determined that the development of the property will not impact upon any aquatic habitat. The site was determined to have a Low sensitivity and the project is deemed as acceptable.

8 REFERENCES

BROMILOW, C. 2001. Problem Plants of South Africa: a Guide to the Identification and Control of more than 300 invasive plants and other weeds. Briza Publications, Pretoria.

CSIR (Council for Scientific and Industrial Research). 2010. National Aquatic Ecosystem Priority Areas (NFEPA). Council for Scientific and Industrial Research, Pretoria, South Africa.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, 1999a. Resource Directed Measures for Protection of Water Resources. Volume 4. Wetland Ecosystems Version 1.0, Pretoria.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, 2005. A Practical Field Procedure for Identification and Delineation of Wetland and Riparian areas. Edition 1, September 2005. DWAF, Pretoria.

DRIVER, A., NEL, J.L., SNADDON, K., MURRAY, K., ROUX, D.J., HILL, L., SWARTZ, E.R., MANUEL, J. AND FUNKE, N. 2011. *Implementation Manual for Aquatic Ecosystem Priority Areas. Report to the Water Research Commission*. Pretoria

DWAF. 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare. Stream Flow Reduction Activities, Department of Water Affairs and Forestry, Pretoria, South Africa

LE MAITRE, D.C., SEYLER, H., HOLLAND, M., SMITH-ADAO, L.B., NEL, J.L., MAHERRY, A. and WITTHÜSER. K 2018. Strategic Water Source Areas for surface water (Vector data). One of the outputs of the Identification, Delineation and Importance of the Strategic Water Source Areas of South Africa, Lesotho and Swaziland for Surface Water and Groundwater, WRC Report No TT 754/1/18, Water Research Commission, Pretoria, South Africa.

LE MAITRE, D.C., SEYLER, H., HOLLAND, M., SMITH-ADAO, L., NEL, J.L., MAHERRY, A. AND WITTHÜSER, K. (2018) Identification, Delineation and Importance of the Strategic Water Source Areas of South Africa, Lesotho and Swaziland for Surface Water and Groundwater. Report No. TT 743/1/18, Water Research Commission, Pretoria.

NAIMAN, R.J., AND H. DECAMPS. 1997. The ecology of interfaces -- riparian zones. Annual Review of Ecology and Systematics 28:621-658

MUCINA, L. AND RUTHERFORD, M. C. (EDS) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

ROGERS KH. 1995. Riparian Wetlands. In: Wetlands of South Africa, Cowan GI (ed). Department of Environmental Affairs and Tourism: Pretoria.

VAN GINKEL, C.E., GLEN, R.P., GORDAN-GRAY, K.D., CILLIERS, C.J., MUASYA AND VAN DEVENTER, P.P., 2011. Easy identification of some South African Wetland Plants (Grasses, Resticios, Sedges, Rushes, Bulrushes, Eriocaulons and Yellow-eyed grasses). WRC Report No. TT 459/10.

9 DECLARATION OF THE SPECIALIST

I ……**Debbie Fordham**……, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

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

The report has been prepared:

- As per the requirements of Section 32 (3) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations 2017 as per Government Notice No. 326 Government Gazette, 7 April 2017.
- In accordance with the latest NEMA Minimum Requirements and Protocol for Specialist Aquatic Biodiversity Impact Assessment as contained in the "*Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes of Section 45 (a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental Authorization*" (10 May 2020).
- In accordance with Section 13: General Requirements for Environmental Assessment Practitioners (EAPs) and Specialists as well as per Appendix 6 of GNR 982 - Environmental Impact Assessment 2014 Regulations and the National Environmental Management Act, 1998.
- With consideration to Cape Nature's standard requirements for biodiversity assessments.
- In accordance with DEA&DP's Guideline on Involving biodiversity specialists in the EIA process.
- Independently of influence or prejudice by any parties.

Signature of the Specialist: Date: 21/6/2021

Name of company (if applicable): Sharples Environmental Services cc

10 SPECIALIST CV

Debra Jane Fordham

Aquatic Ecologist working in George at Sharples Environmental Services cc as a specialist consultant and managing water use licensing applications (WULAs). Debbie holds a M.Sc. degree in Environmental Science from Rhodes University, by thesis, entitled: The geomorphic origin and evolution of the Tierkloof Wetland, a peatland dominated by *Prionium serratum* in the Western Cape.

Debbie has conducted many aquatic habitat assessments and rehabilitation plans of various spatial and temporal scales, in numerous locations within South Africa. These assessments include wetland, river, and estuary health assessments, rehabilitation plans, water quality analysis, monitoring recommendations, and generally compiling reports that clearly convey the findings and contribute to future management. She has also completed Water Use License Applications, Basic Assessment Reports and Environmental Management Plans. Debbie is highly proficient with GIS mapping software and incorporates spatial analysis in all assessments.

Key skills:

- Desktop mapping and infield assessment for wetland/ riparian habitat delineation
- Assessment of wetland and riparian functional importance (EIS) and Present Ecological State (PES) now including the WET-Health V2 tool, amongst others.
- Evaluating impacts to wetland and riparian systems from proposed developments
- Identifying mitigation measures and developing monitoring and rehabilitation plans
- WULA, EIA and BAR Applications
- ArcGIS V10, QGIS 2.18, CoralDraw X4, Strater V3, Statistica V9, MSOffice

Tertiary Education at Rhodes University, South Africa:

M.Sc. Environmental Science

Master of Science degree, by thesis, entitled:

The geomorphic origin, evolution and collapse of a peatland dominated by Prionium serratum: a case study of the Tierkloof Wetland, Western Cape.(Supervised by Prof. Fred Ellery)

BA Honours – Environmental Science

Honours Dissertation: The status and use of Aloe ferox. Mill in the Grahamstown commonage, South Africa. (Supervised by Prof. Sheona Shackleton)

Honours Subjects

- Wetland Ecology
- Environmental Water Quality /Toxicology
- Environmental Impact Assessment (EIA)
- Biodiversity, Non-Timber Forest Products (NTFPs) and Rural Livelihoods
- Statistics

BA Degree – Environmental Science and Geography

Current position:

Aquatic Ecologist and WULA Manager

Sharples Environmental Services cc: 2016/08/10 - Present

Debbie fulfils the specific requirements of each project with regards to the relevant aquatic legislation, such as conducting aquatic habitat impact reports and Water Use Licence Applications (WULAs). This mostly requires undertaking ground-truthing, classification, infield identification, delineation, impact assessment and mapping of aquatic ecosystems. SES conduct Present Ecological State (PES), functional importance assessments and Ecological Importance and Sensitivity (EIS) assessments of aquatic ecosystems. She conducts environmental impact and environmental sensitivity (constraints) assessments on aquatic habitats to determine if they are at risk of being impacted upon by proposed development areas during construction and operational phases of development. Including identifying direct, indirect, and cumulative impacts that proposed developments will have on aquatic habitats and the significance of these impacts and recommend actions that should be taken to prevent impacts on aquatic habitats. She also determines and maps No-Go and buffer zones utilising professional knowledge and buffer zone guidelines for rivers, wetlands and estuaries.

Publications and memberships:

Bekker, D. J. & Shackleton, S. 2010. The status and use of *Aloe ferox Mill*. in the Grahamstown commonage. Policy Brief, Rhodes University

- Professional Wetland Scientist applicant with SWS
- Southern Cape Wetland Society (SCWS)

- South African Wetlands Society (SAWS)
- Freshwater Ecosystem Network (FEN)
- Southern African Association of Geomorphologists (SAAG)
- DWAF accredited wetland delineation

Recent Aquatic Impact Assessment Projects:

- *Installation of A Water Pipeline from An Existing Borehole to The Herbertsdale Reservoir, Mossel Bay Municipality*
- *Unauthorised Clearance of Vegetation and Construction of a Dam on Farm Angeliersbosch Re/157, Prince Albert*
- *Rehabilitation of The Excavation of a Channel Within the Brandwag River, On the Remainder of Farm Bowerf 161, Brandwacht, Mossel Bay*
- *Rehabilitation Plan for activities On A Portion of Remainder Portion 104 Of the Farm Modder Rivier No 209, George*
- *Aquatic Impact Assessment for The Proposed Extension of Walvis Street, Mossel Bay*
- *Rehabilitation Plan for the transformation of agricultural land to commercial land on Farm Re 109/209, George*
- *Aquatic assessment for the proposed Dana Bay Access Road, near Mossel Bay*
- *Invasive Alien Plant Control Plan for New Horizons Mixed-Use Development on Farm Hillview No. 437, Plettenberg Bay*
- *Cemetery expansion on Erf 566 and 480, Melkhoutfontein*
- *The expansion of Goue Akker Cemetery in Beaufort West*
- *Construction of a bulk sewerage pipeline from Green Valley township, Wittedrift, to the Plettenberg Bay WWTW*
- *Periodic Maintenance of Trunk Road 31- Barrydale To Ladismith (Km 30.89 To Km 76.06), Western Cape Province*
- *Expansion of the Gansbaai Sand en Klip Quarry*
- *Seven Oaks Residential Development, Wittedrift, Plettenberg Bay*
- *Gran Sasso Quarry water abstraction and proposed construction of a road crossing a watercourse, Tygervalley, Cape Town*
- *Maintenance of Trunk Road 33/4 and Trunk Road 34/2, though Meiringspoort, Western Cape Province*
- *Proposed Waste Water Treatment Works, Irrigation Activities & Effluent Discharge by Parmalat SA (Pty) Ltd, Bonnievale*

- *Development of Remainder of Erf 562 Kurland, Plettenberg Bay*
- *Ladismith Cheese Water Use Application*
- *Construction of A 22kv Overhead Powerline, near Humansdorp, Eastern Cape*
- *Development of Herold's Bay Country Estate on A Portion of Portion 7 Of Farm Buffelsfontein No. 204, Herold's Bay*
- *Groot Witpan and Konga Pan salt mining, Northern Cape*
- *Gemsbok Horn salt pan mine prospecting*
- *Hartenbos Estuary Habitat Integrity Assessment with Fish Survey and water quality analysis*
- *The proposed Aalwyndal Precinct Plan Development: Biodiversity Component*
- *Tweekuilen Estuary Habitat Integrity Assessment with Fish Survey*
- *Residential Development on Portion 3 of Kraaibosch 195, George*

End