AQUATIC BIODIVERSITY COMPLIANCE STATEMENT

Erf RE/2833, Groot Brak, Western Cape.

Prepared for Cape EAPrac

by

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DECLARATION OF SPECIALIST INDEPENDANCE

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
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- I do not have any influence over decisions made by the governing authorities;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant;
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;
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- All the particulars furnished by me in this document are true and correct.

Specialist: Dr. James Dabrowski (Ph.D., Pr.Sci.Nat. Water Resources)

Date: 31 July 2023

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1. INTRODUCTION

Confluent Environmental was requested by Cape EAPrac to conduct a Site Sensitivity Verification Report (SSVR) for RE/2833, Great Brak, Western Cape. A medium and low density residential housing development is planned for the property.

1.1 Environmental Screening Tool Output

According to the protocols specified in GN 1540 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when Applying for Environmental Authorisation), assessment and reporting requirements for aquatic biodiversity are associated with a level of environmental sensitivity identified by the national web-based environmental screening tool (screening tool). An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of:

- **Very High** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment; or
- **Low** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.

The screening tool classified the Erf RE/2833 as being of **Low** aquatic biodiversity. According to the protocol, a site sensitivity verification must however be undertaken to confirm the sensitivity of the site as indicated by the screening tool. In terms of aquatic biodiversity, the sensitivity of a property is typically determined by the presence of a watercourse or the potential impacts to a watercourse located outside of the property boundaries.

1.2 Definition of a Watercourse

According to the National Environmental Management Act (NEMA) and the National Water Act (NWA) a watercourse means:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be watercourse, and
- A reference to a watercourse includes, where relevant, its bed and banks.

For the purposes of this assessment, a wetland area is defined according to the NWA (Act No. 36 of 1998) 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 typically adapted to life in saturated soil".

Wetlands must therefore have one or more of the following attributes to meet the NWA wetland definition (DWAF, 2005):

- A high water table that results in the saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil;
- Wetland or hydromorphic soils that display characteristics resulting from prolonged saturation, i.e. mottling or grey soils; and
- The presence of, at least occasionally, hydrophilic plants, i.e. hydrophytes (water loving plants).

1.3 Scope of Work

The objectives of this assessment included the following:

- To undertake a desktop analysis and site inspection to verify the sensitivity of aquatic biodiversity as **Very High** or **Low**; and (if applicable)
- Map aquatic features considered to be of Very High sensitivity.

2. APPROACH

The following approach was adopted to determine the sensitivity of aquatic biodiversity of the property:

- Interrogation of available desktop resources including:
    - DWS spatial layers;
    - National Freshwater Ecosystem Priority Areas (NFEPA) spatial layers (Nel et al., 2011);
    - National Wetland Map 5 and Confidence Map (CSIR, 2018) – the latest national wetland inventory map for South Africa;
    - Western Cape Biodiversity and Spatial Plan (WCBSP) for Mossel Bay (CapeNature, 2017).
- A site visit was undertaken, during which time the following activities were undertaken:
    - Identification and classification of watercourses within the footprint of the site according to methods detailed in Ollis et al. (2013);
    - Soil augering to confirm the presence of soil indicators (DWAF, 2005) that may indicate the presence of a wetland (if applicable); and
    - Identification of hydrophilic plant species that may indicate the presence of wetland plant species (if applicable).

The presence of wetlands was verified in accordance with DWAF (2005) guidelines which considers the following four specific indicators:

- The Terrain Unit Indicator: Identifies those parts of the landscape where wetlands are more likely to occur;
- The Soil Form Indicator: Identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation;
- The Soil Wetness Indicator: Identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation (i.e. mottling and gleying within 50 cm of the soil surface); and

- The Vegetation Indicator: Identifies hydrophilic vegetation associated with frequently saturated soils.

The following soil wetness indicators were used to identify/confrim zones of saturation in any suspected wetland areas:

- Temporary Zone: Short periods of saturation (less than three months per annum) characterised by few high chroma mottles and minimal grey matrix (< 10 %).
- Seasonal Zone: Significant periods of wetness (at least three months per annum) characterised by many low chroma mottles and a grey matrix.
- Permanent Zone: Wetness all year round characterised by a prominent grey matrix and few to no high chroma mottles.

3. DESKTOP SURVEY

The property falls within Primary Catchment K (Kromme) area and in quaternary catchment K20A (Figure 1). The site does not fall within a sub-quaternary catchment (SQC) that has been categorised as a Freshwater Ecosystem Priority Area (FEPA) or a Strategic Water Source Area (SWSA).

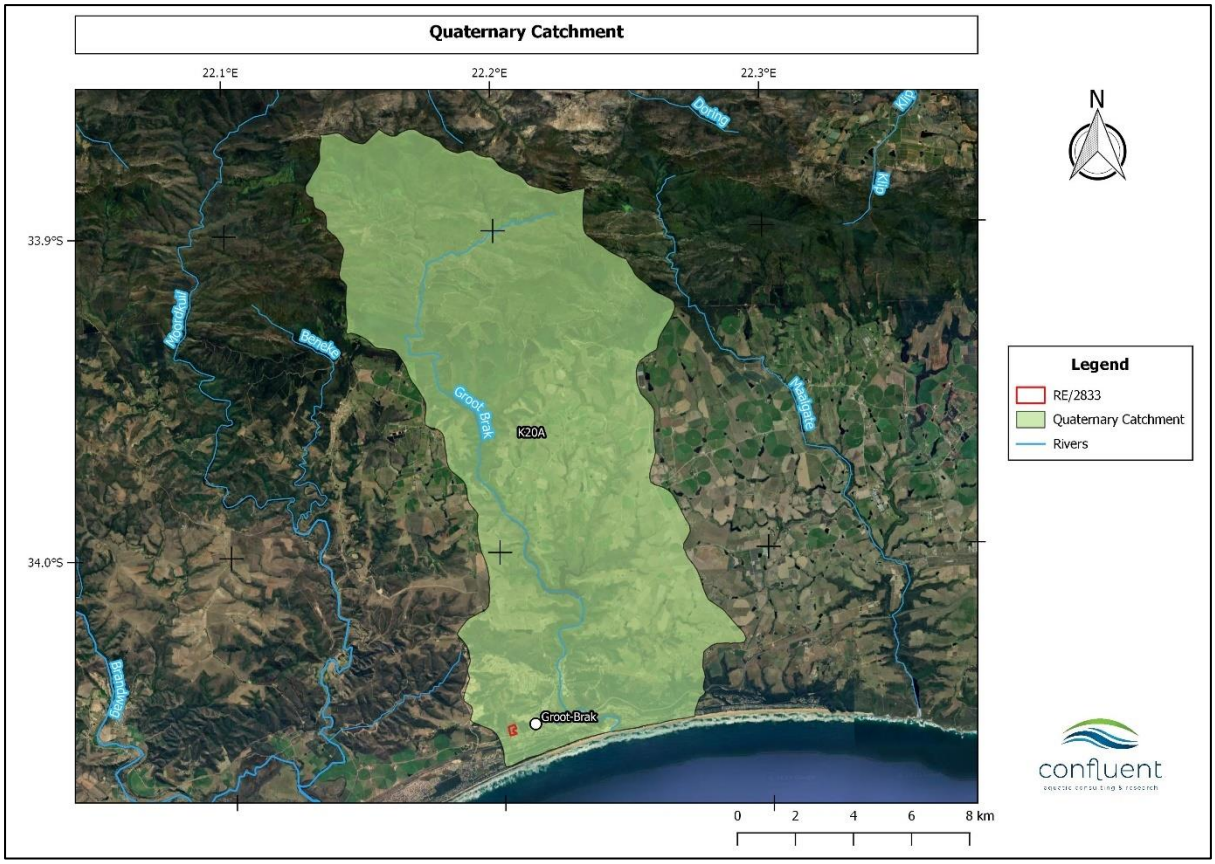

Figure 1: Location of the property in relation to mapped freshwater features.

According to geospatial databases, the following watercourses are indicated to occur on Erf RE/2833 (Figure 2):

- A non-perennial drainage line is indicated to flow through a valley bottom that bisects the property.
- A non-perennial drainage line is also indicated to run along the southern boundary of the property.

According to the Western Cape Biodiversity Spatial Plan the south-western most corner of the property is mapped as an aquatic ESA2 (Figure 3). These are considered as areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of Critical Biodiversity Areas (CBAs) and are often vital for delivering ecosystem services.

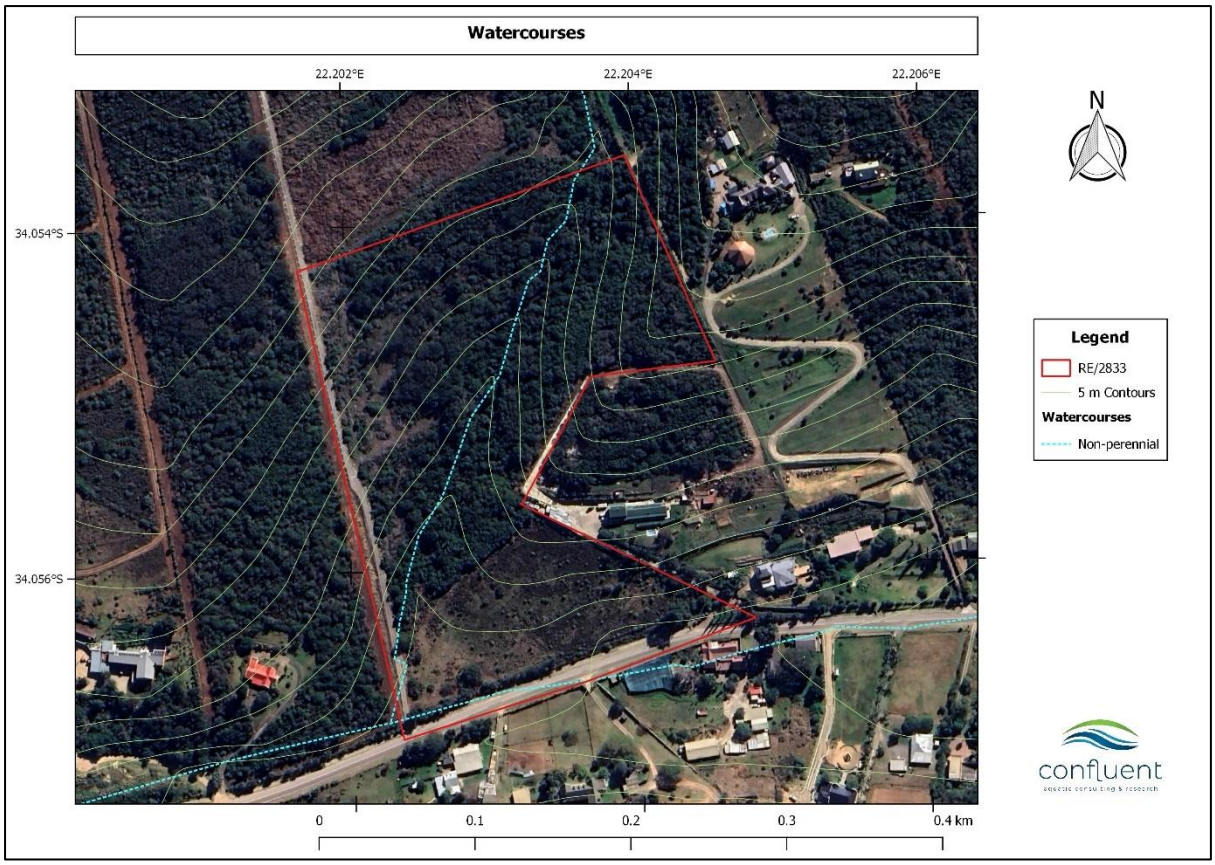

Figure 2: Mapped watercourses.

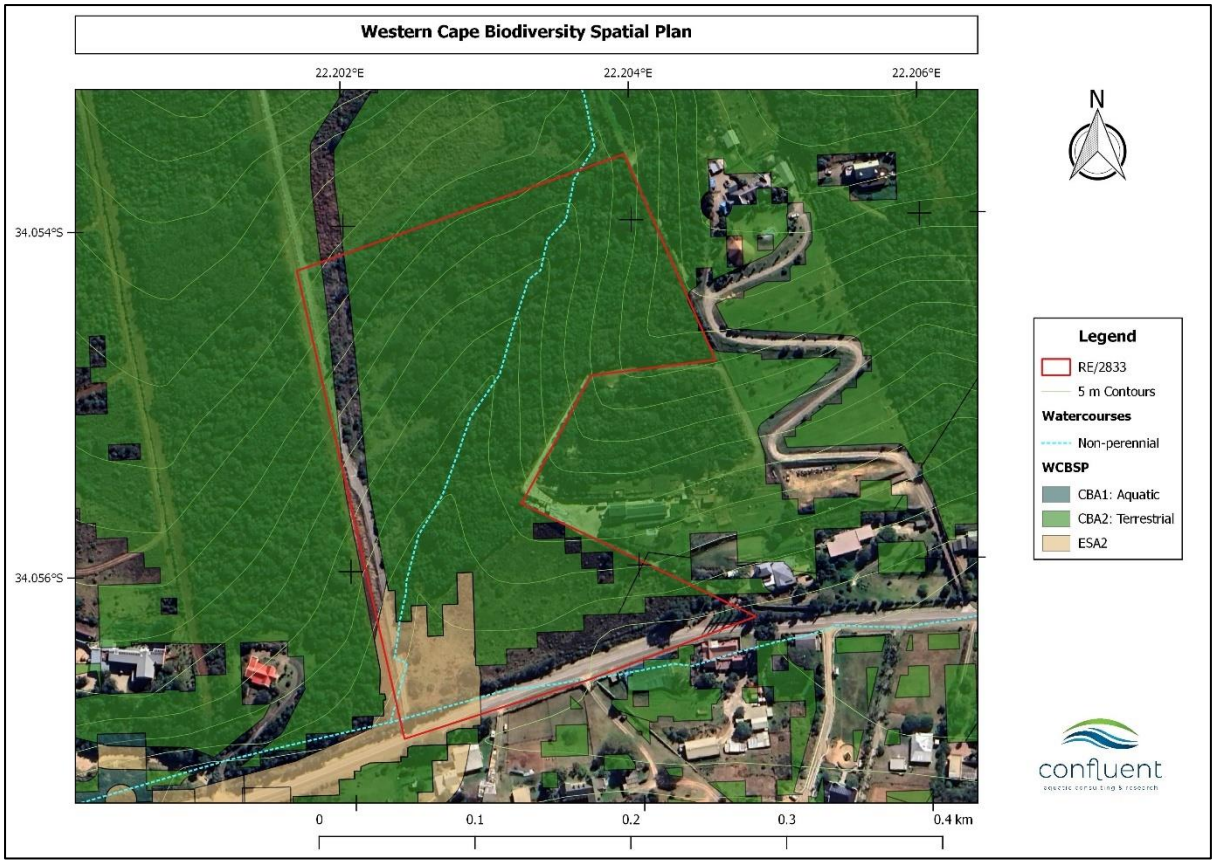

Figure 3: Western Cape Biodiversity Spatial Plan

4. SITE VISIT

4.1 Non-Perennial Drainage Line

The valley was heavily invaded by *Acacia mearnsii* dominated thicket on the northern slope and less invaded Hartenbos Dune Thicket on the southern slope (Fouche, 2023). Vegetation along the valley bottom is very dense and almost impenetrable in places. While the valley is a low point in the landscape and therefore a natural area of drainage, no discernible bed and banks were observed along the valley bottom, indicating that water does not regularly flow through the valley (Figure 4). When water does flow, the volume and energy of flow is not sufficient to form a bed and banks and any associated permanent or temporary aquatic habitat. The lack of hydrophilic plant species, together with the lack of any seasonal, temporary or permanent soil saturation indicators shows that water does not tend to stand or accumulate along the drainage area.

Given the lack of any defined bed, banks or channel, and according to the classification system developed by Ollis et al. (2013), the feature indicated as a non-perennial drainage line in Figure 2 is not defined as a watercourse and is not associated with any aquatic habitat or aquatic biodiversity.

The non-perennial drainage line indicated to run along the southern boundary of Erf RE/2833 is a man-made stormwater canal and is not classified as a natural watercourse. The area defined as an aquatic ESA2 does therefore not serve any function in terms of supporting the function of any natural watercourses.

Figure 4: Photographs taken along low point of the valley floor indicating dense thicket vegetation with no discernible signs of bed, banks or a channel that would indicate the presence of a watercourse.

5. SENSITIVITY MAPPING

While no formal watercourse is present on the property, intermittent flows are likely to occur along the valley bottom under exceptional circumstances. The valley bottom does therefore serve a hydrological function and degradation/disturbance of the area, in combination with steep slopes and increased stormwater flows from the development area, could lead to erosion along the valley bottom. For this reason, the valley bottom should be considered as a hydrologically sensitive area and protection of the valley bottom is recommended.

Buffer zones have been defined as a strip of land with a use, function or zoning specifically designed to act as barriers between human activities and sensitive water resources with the aim of protecting these water resources them from adverse negative impacts. A buffer for the drainage area was estimated based on buffer zone guidelines developed by Macfarlane and Bredin (2017). These guidelines estimate required buffer zone widths based on a combination of input parameters which include, *inter alia*, the nature of the development and associated impacts, basic climatic, soil and vegetation conditions, the PES and EIS of the river and the implementation of appropriate mitigation measures. The tool was implemented assuming that the valley bottom did host a non-perennial, intermittent watercourse of very low ecological importance and assumed some level mitigation to prevent erosion and sedimentation during the construction phase. The tool estimated a buffer width of 30 m either side of the lowest point along the valley floor (i.e. 30 m either side of the non-perennial drainage line indicated in Figure 2).

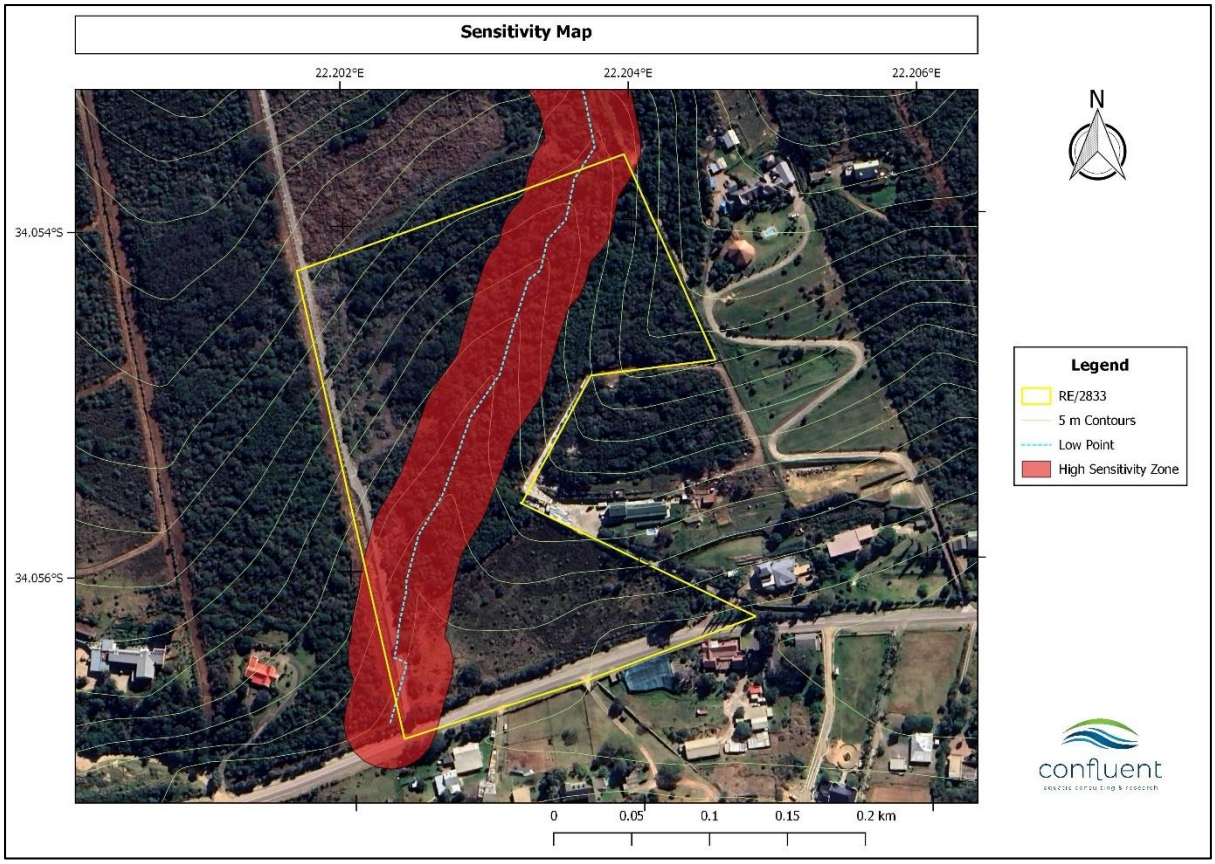

Figure 5: Map indicating hydrologically sensitive areas.

6. MANAGEMENT RECOMMENDATIONS

6.1 Stormwater Management

A key impact related to residential developments is the generation of large volumes of stormwater associated with an increased area of impermeable surfaces (i.e. roads, roofs and other infrastructure). Stormwater is typically conveyed into watercourses, where high volumes (and associated high energy) cause degradation of watercourses, mainly due to the erosion of the bed and banks. In this respect given the steep slopes within the property, even though the drainage line is located outside of the development footprint, it is potentially vulnerable to stormwater impacts.

It is therefore important that stormwater generated on site should be managed according to Sustainable Drainage System (SuDS) principles. This requires that as much stormwater as possible should be attenuated within the development footprint. For example, the City of Cape Town guideline is that developments must provide for 24-hour extended detention of the 1-year return interval 24-hour storm event. In this respect the following measures, *inter alia*, should be considered:

- Rainwater harvesting tanks must be installed;
- Use of swales and detention ponds to attenuate stormwater runoff, encourage infiltration and reduce the speed, energy and volumes at which stormwater is discharged from the site;
- Use of permeable paving to encourage infiltration into the soil; and

- Use of retention ponds and artificial wetlands to capture stormwater runoff and prevent its discharge from the site.

6.2 Erosion Management

The steep slopes of the property will be vulnerable to erosion during clearance of the site and the construction phase. It is therefore important that appropriate erosion control measures are implemented, which include *inter alia,* the following:

- Ensure that construction activities do not cause any preferential flow paths and concentrated surface runoff during rainfall events.
- Clearly demarcate the construction area and ensure that heavy machinery does not compact soil or disturb vegetation outside of these demarcated areas.
- Reduce transport of sediment through use of structures such as silt fences and biodegradable coir logs placed along a contour below the development footprint (Figure 6).

Figure 6: Examples of silt fences (left) and coir logs (right) used to trap sediment mobilised from steep slopes.

- Ensure that vegetation clearing is conducted in parallel with the construction progress to minimise erosion and runoff.
- Revegetate exposed areas once construction has been completed.
- Ensure that stormwater and runoff generated by hardened surfaces is discharged in retention areas (i.e. swales or retention ponds), to avoid concentrated runoff and associated erosion.

7. CONCLUSION

- No watercourses were observed on the property and in terms of the aquatic biodiversity protocol the aquatic biodiversity of RE/2833 is therefore verified as **Low**.
- While no formal watercourse is present on the property, intermittent flows are likely to occur along the valley bottom under exceptional circumstances. The valley bottom does therefore serve a hydrological function and degradation/disturbance of the area, in combination with steep slopes and increased stormwater flows from the development area, could lead to erosion along the valley bottom. For this reason, a buffer zone of 30 m either side of the lowest point along the value bottom is recommended.

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