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# **AQUATIC COMPLIANCE STATEMENT**

**Erf 1058, Wilderness, Western Cape.**

**Prepared for Wealth Spring**

**by**

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- 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;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- 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.



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Date: June 2023

## TABLE OF CONTENTS

<b>1. INTRODUCTION</b> .....	<b>1</b>
1.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT .....	1
1.2 NATIONAL WATER ACT (NWA, 1998) .....	1
1.3 SCOPE OF WORK .....	2
<b>2. APPROACH</b> .....	<b>3</b>
2.1 SENSITIVITY MAPPING .....	3
<b>3. ASSUMPTIONS &amp; LIMITATIONS</b> .....	<b>4</b>
<b>4. DESKTOP SURVEY</b> .....	<b>4</b>
4.1 NATIONAL FRESHWATER ECOSYSTEM PRIORITY ATLAS .....	6
4.2 STRATEGIC WATER SOURCE AREA .....	7
<b>5. SITE DEVELOPMENT PLAN</b> .....	<b>7</b>
<b>6. SITE VISIT</b> .....	<b>9</b>
<b>7. SENSITIVITY MAPPING</b> .....	<b>10</b>
<b>8. MANAGEMENT RECOMMENDATIONS</b> .....	<b>11</b>
8.1 STORMWATER MANAGEMENT .....	11
8.2 EROSION MANAGEMENT .....	12
<b>9. AQUATIC BIODIVERSITY COMPLIANCE STATEMENT</b> .....	<b>12</b>
<b>10. REFERENCES</b> .....	<b>13</b>

## LIST OF FIGURES

Figure 1: Map indicating the location of the property relative to the quaternary catchment area. ....	4
Figure 2: Location of the property in relation to mapped watercourses. ....	5
Figure 3: Map of the property relative to the Western Cape Biodiversity Spatial Plan (WCBSP). ....	5
Figure 4: Map indicating the property location in relation to mapped Freshwater Ecosystem Priority Areas. ....	6
Figure 5: Proposed Site Development Plan. ....	8
Figure 6: Photographs of the property including view to the south (A), the densely vegetated watercourse to the west of the property (B), dense stands of <i>A. mearnsii</i> (C) poorly vegetated ground below <i>A. mearnsii</i> thickets (D). ....	9
Figure 7: Map indicating the 500 m regulated area relative to the development footprint. ....	10
Figure 8: Map indicating the georeferenced development footprint in relation to aquatic biodiversity sensitivity. ....	11

Figure 9: Examples of silt fences (left) and coir logs (right) used to trap sediment mobilised from steep slopes. .... 12

## 1. INTRODUCTION

Confluent Environmental was appointed by Wealth Spring to undertake a freshwater survey for a proposed residential development on Erf 1058, Wilderness, George Local Municipality. The site has been classified as having '**Very High**' aquatic biodiversity by the Department of Environmental Affairs (DEA) screening tool.

The scope of work for this report is guided by the legislative requirements of the National Environmental Management Act (NEMA).

### 1.1 National Environmental Management Act

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 site as being of **Very High** aquatic biodiversity as it occurs in a Freshwater Ecosystem Priority Area (FEPA) and a Strategic Water Source Area (SWSA). According to the protocol, a site sensitivity verification must be undertaken to confirm the sensitivity of the site as indicated by the screening tool.

### 1.2 National Water Act (NWA, 1998)

The Department of Water & Sanitation (DWS) is the custodian of South Africa's water resources and therefore assumes public trusteeship of water resources, which includes watercourses, surface water, estuaries, or aquifers.

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):

*“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).

No activity may take place within a watercourse unless it is authorised by the Department of Water and Sanitation (DWS). According to Section 21 (c) and (i) of the National Water Act, an authorization (Water Use License or General Authorisation) is required for any activities that impede or divert the flow of water in a watercourse or alter the bed, banks, course or characteristics of a watercourse. The regulated area of a watercourse for section 21(c) or (i) of the Act water uses means:

- a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
- c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

According to Section 21 (c) and (i) of the NWA, any water use activities that do occur within the regulated area of a watercourse must be assessed using the DWS Risk Assessment Matrix (GN 509) to determine the impact of construction and operational activities on the flow, water quality, habitat and biotic characteristics of the watercourse. Low Risk activities require a General Authorisation (GA), while Medium or High Risk activities require a Water Use License (WUL).

### 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
- Compile an Aquatic Biodiversity Compliance Statement or Aquatic Biodiversity Specialist Assessment based on the site verification of the sensitivity of the site.
- Determine whether any activities fall within the regulated area of a watercourse as defined by the NWA.

## 2. APPROACH

The following rationale was adopted to determine the sensitivity of aquatic biodiversity within the footprint of the site:

- In the event that watercourses are confirmed to fall within the development footprint and that these watercourses will be impacted by the development, then the site sensitivity is confirmed as **Very High** and a full specialist freshwater assessment is required; and
- In the event that no watercourses are identified within the development footprint the site sensitivity is confirmed as **Low** and an Aquatic Compliance statement is required.

The determination of the site sensitivity relied upon the following approaches:

- 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).

### 2.1 Sensitivity Mapping

Watercourses on or adjacent to the site were mapped in the field and verified at a desktop level using satellite imagery. A protective buffer zone was applied to watercourses potentially affected by the development. 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 from adverse negative impacts. Appropriate buffers were 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 activity and associated impacts, basic climatic and soil conditions and the implementation of appropriate mitigation measures.

***For the purposes of this assessment, the watercourse AND its associated buffer was considered to be of Very High sensitivity. If any construction and operational activities fall within the delineated watercourse OR buffer zone, the sensitivity of the site is confirmed as Very High. If all construction and operational activities fall outside of the***

***delineated watercourse AND its buffer zone, then the sensitivity of the site is confirmed as Low.***

### 3. ASSUMPTIONS & LIMITATIONS

- The assessment of the site visit represents a brief temporal snapshot of conditions on the site. Changes in season or short-term changes in climatic conditions may possibly result in the formation of aquatic habitats (e.g. temporary or seasonal wetlands) under significantly wetter conditions. Despite this limitation the sensitivity of aquatic biodiversity on the site was determined with a very high level of confidence.

### 4. DESKTOP SURVEY

The site falls within Primary Catchment K (Kromme) area and in quaternary catchment K30D (Figure 1). According to geospatial data sources a non-perennial drainage line runs just outside of the western boundary of the property. No other watercourse are mapped to occur within the property boundaries (Figure 2). No aquatic features have been included in the Western Cape Biodiversity Spatial Plan (WCBSP) covering the property (Figure 3).

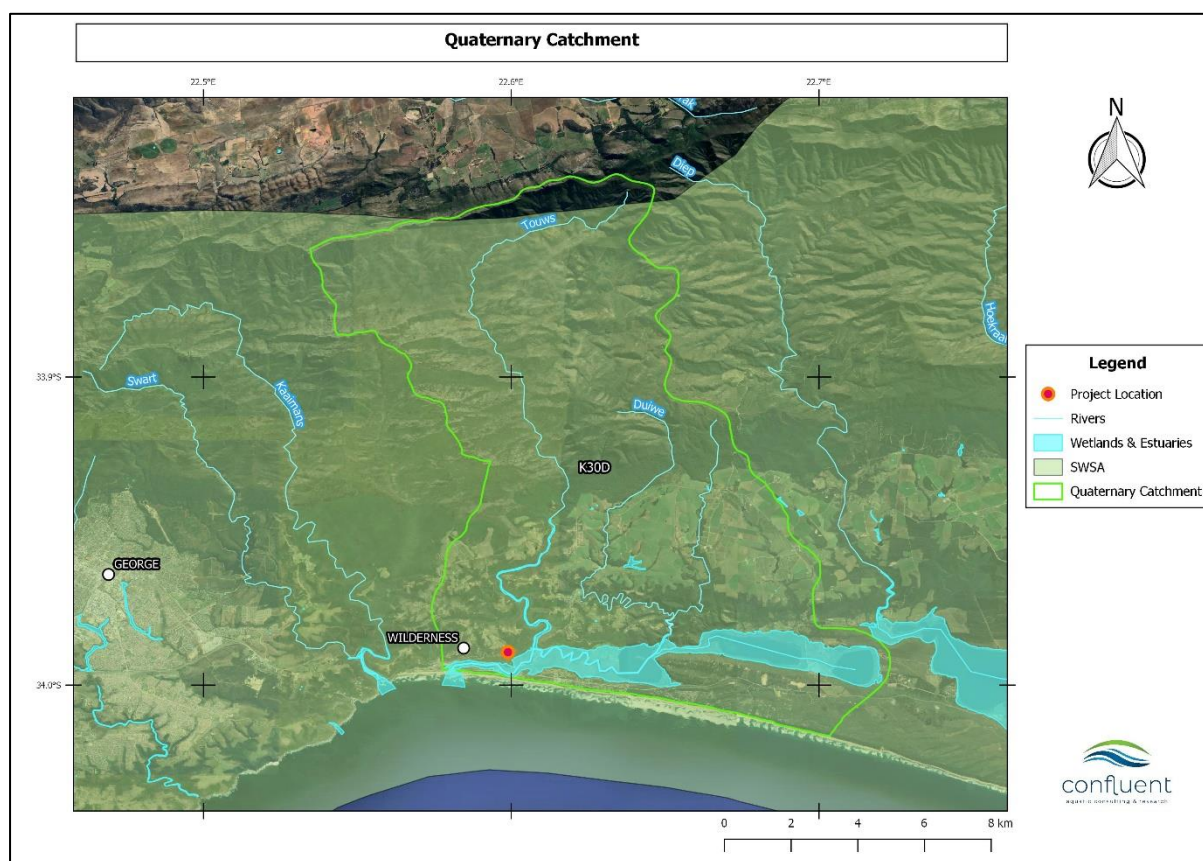


Figure 1: Map indicating the location of the property relative to the quaternary catchment area.



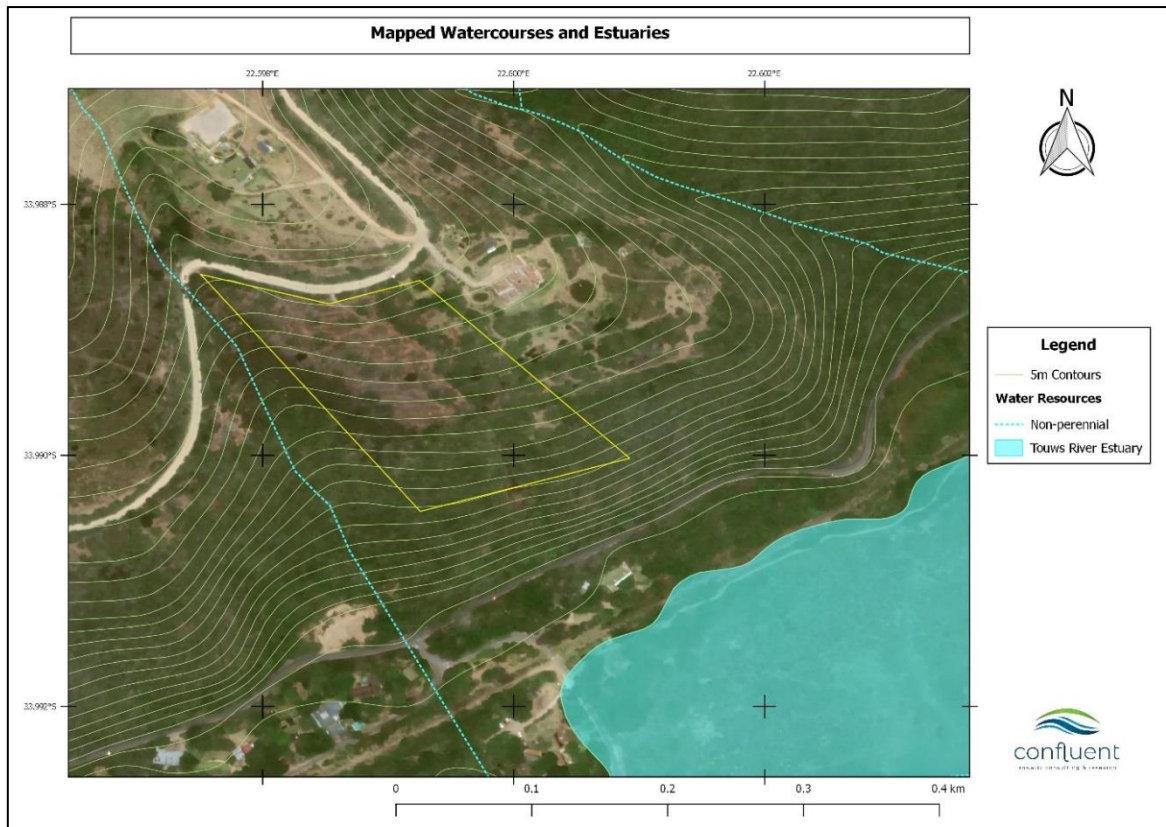


Figure 2: Location of the property in relation to mapped watercourses.

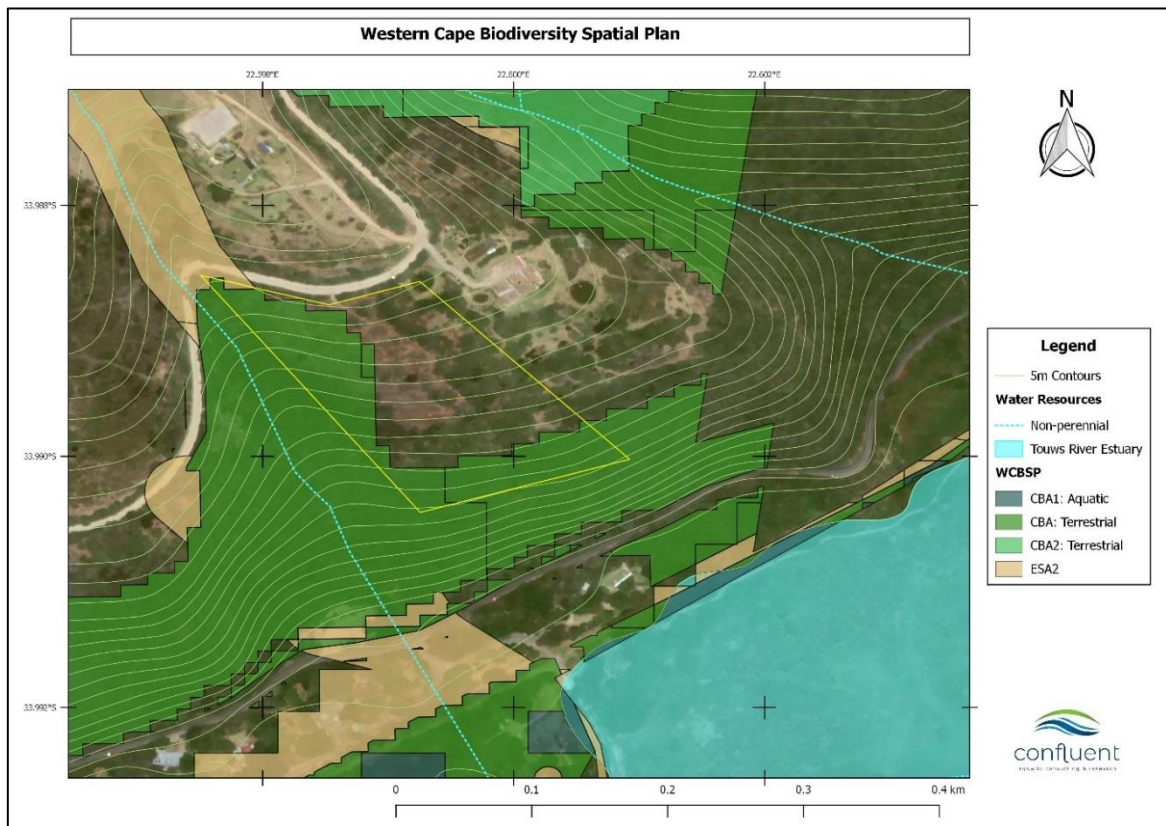


Figure 3: Map of the property relative to the Western Cape Biodiversity Spatial Plan (WCBSP).

#### 4.1 National Freshwater Ecosystem Priority Atlas

The property falls within sub-quaternary catchment (SQC) 9173, which, according to the National Freshwater Ecosystem Priority Atlas (NFEPAs, Nel et al., 2011), has been classified as a Freshwater Ecosystem Priority Area (FEPA). River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicated that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources (Nel et al., 2011).

For river FEPAs, the whole SQC is identified as a FEPA, although the FEPA status applies to the actual river reach within such a sub-quaternary catchment. The shading of the whole sub-quaternary catchment indicates that the surrounding land and catchment area needs to be managed in a way that maintains the good ecological condition of the river reach, which in this case, is the Touws River. It is therefore important that development does not result in any deterioration of the river or its catchment area. Similarly, the Touws River estuary has been identified as an estuary FEPA, which is also indicative of the good ecological condition of the estuary. The larger drainage network and surrounding land use should therefore be managed to ensure the estuarine system remains in a good ecological condition.

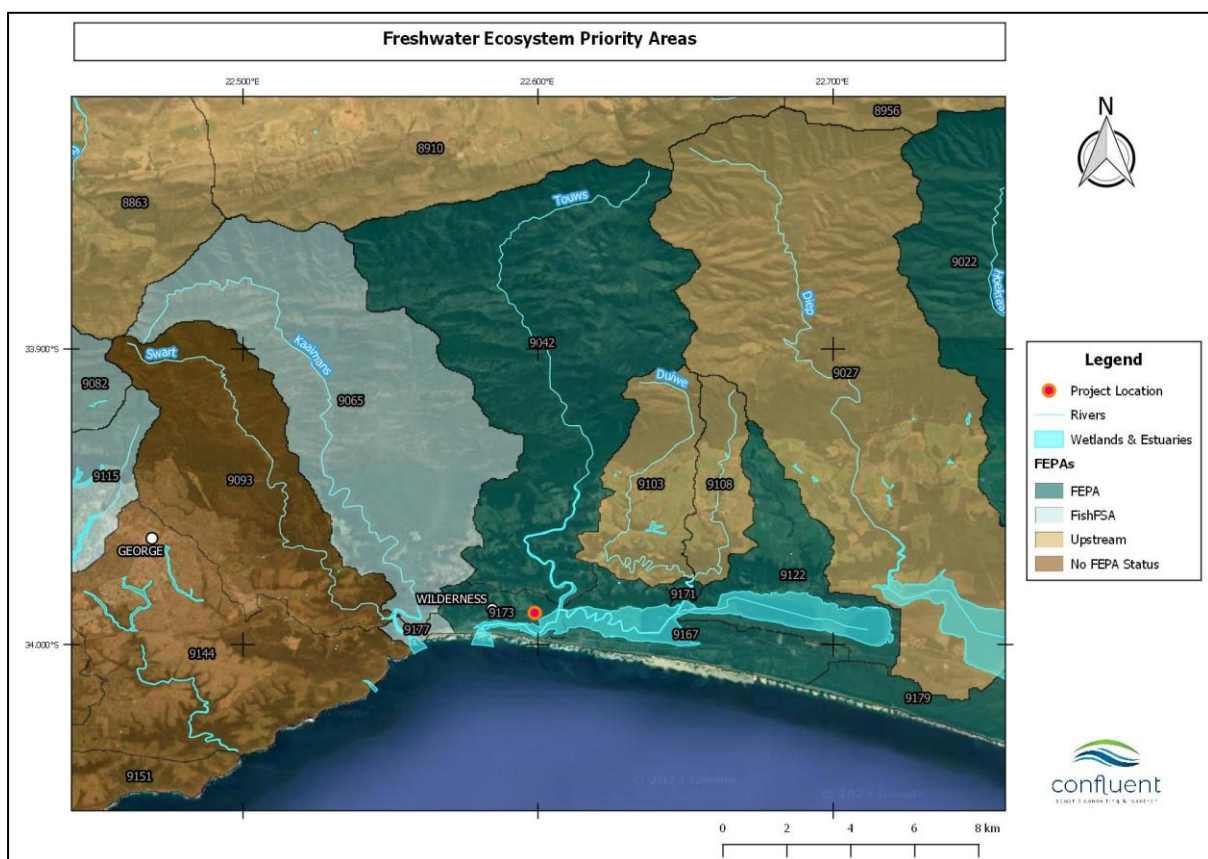


Figure 4: Map indicating the property location in relation to mapped Freshwater Ecosystem Priority Areas.

## 4.2 Strategic Water Source Area

The site does fall within the Outeniqua Strategic Water Source Area (SWSA) (Figure 1) which is considered to be of national importance. SWSAs are defined as areas of land that either:

- a) Supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or
- b) Have high groundwater recharge and where the groundwater forms a nationally important resource; or
- c) Areas that meet both criteria (a) and (b).

SWSAs are vital for water and food security in South Africa and also provide the water used to sustain the economy. Given this context, management and implementation guidelines have been developed with the objective of facilitating and supporting well-informed and proactive land management, land-use and development planning in these nationally important and critical areas (Le Maitre, et al., 2018). The primary principle behind this objective is to protect the quantity and quality of the water they produce by maintaining or improving their condition. The proposed development footprint falls within an urban 'working landscape' and in this context the management objectives are to maintain at least the present condition and ecological functioning of these landscapes, to restore where necessary, and to limit or avoid further adverse impacts on the sustained production of high-quality water.

## 5. SITE DEVELOPMENT PLAN

The proposed site development plan is indicated in Figure 5 and essentially involves the construction of a residential home, garage (with storage and studio), tourist accommodation units and associated hard landscaping (i.e. driveways, service roads, parking, footpaths etc.). The total surface area of the structures and hard landscaping is 830 m<sup>2</sup> and 1093 m<sup>2</sup>, respectively (approximately 6.4 % of the total surface area of the property).

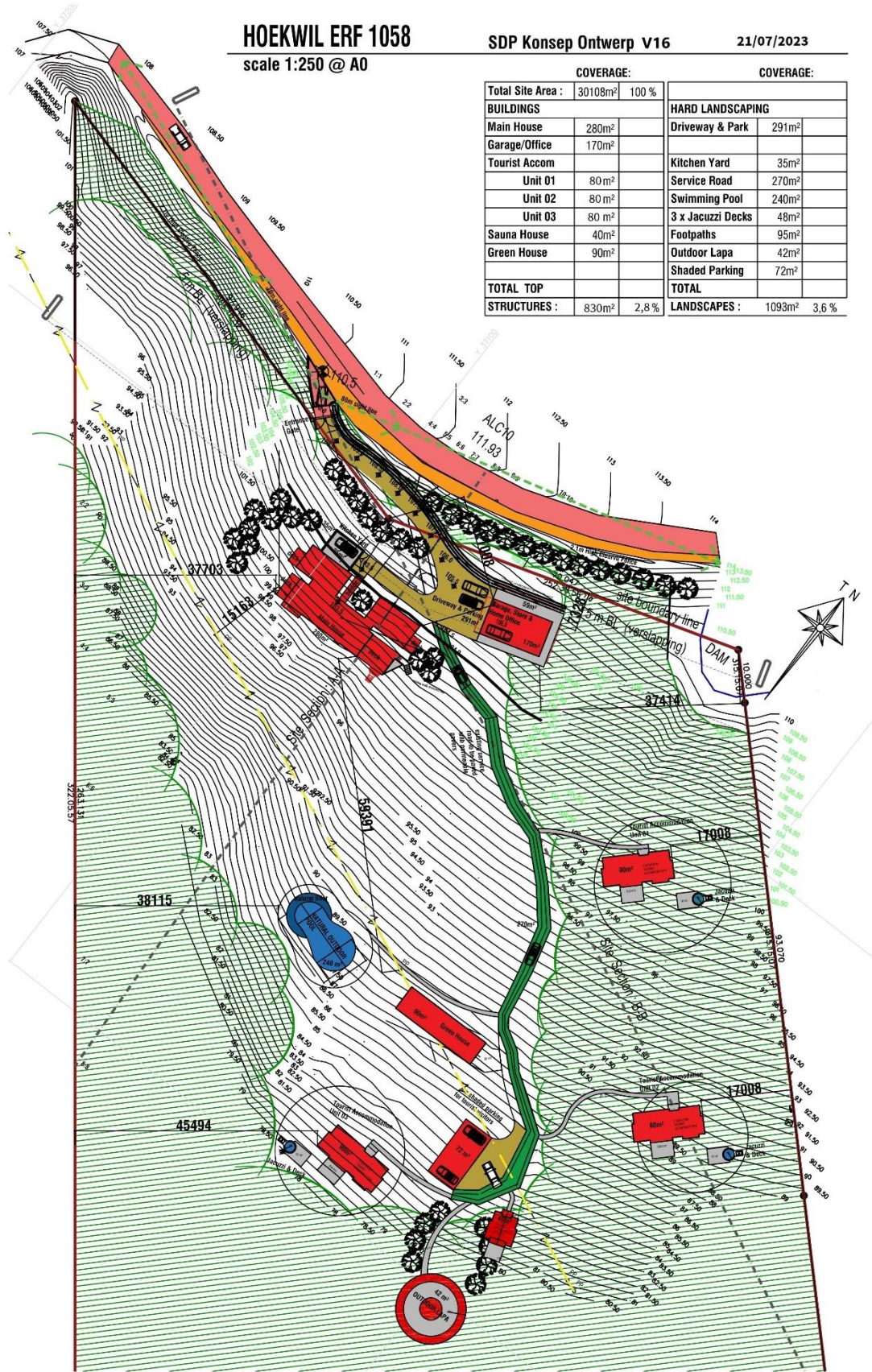


Figure 5: Proposed Site Development Plan.

## 6. SITE VISIT

The site visit was conducted on 2<sup>nd</sup> of June 2023 during which time the entire extent of the proposed development footprint and was traversed by foot. The property slopes down steeply to the south-east towards the Touws River and to the west towards the unnamed non-perennial drainage line. The drainage line is confirmed as a non-perennial drainage line, with very limited habitat development. Its primary function is to convey hydrological flows following periods of heavy rainfall and it serves limited function with respect to hosting aquatic biota. The drainage line is very narrow (less than 2 m wide) and is confined to a narrow, steep sided, heavily vegetated valley. Vegetation comprises of coastal thicket that has been heavily invaded by *Acacia mearnsii*. Apart from the drainage line there are no hydro-geomorphological landscape features (depressions, confined valleys, channels etc.) indicating the presence of a watercourse (i.e. stream, river or wetland) within the development footprint (Figure 6).

In terms of legislation pertaining to the NWA, the development falls outside of the regulated area of the drainage line (i.e. outside of the riparian zone and 1:100 year floodline) and outside the regulated area of a wetland<sup>1</sup> (Figure 7).

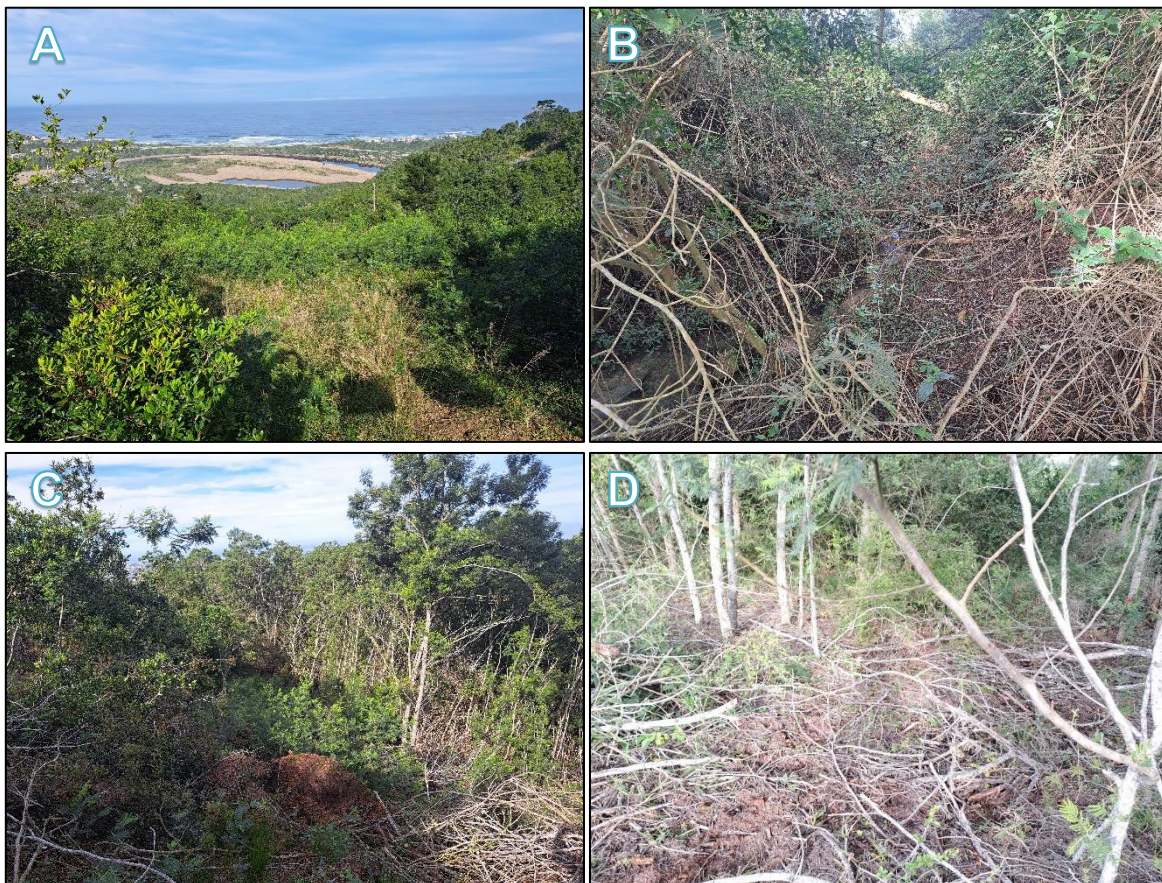


Figure 6: Photographs of the property including view to the south (A), the densely vegetated watercourse to the west of the property (B), dense stands of *A. mearnsii* (C) poorly vegetated ground below *A. mearnsii* thickets (D).

<sup>1</sup> Note that the Touws River Estuary is defined as an estuary and not as a wetland and is therefore not defined as a watercourse as per the definition in Section 1.2.

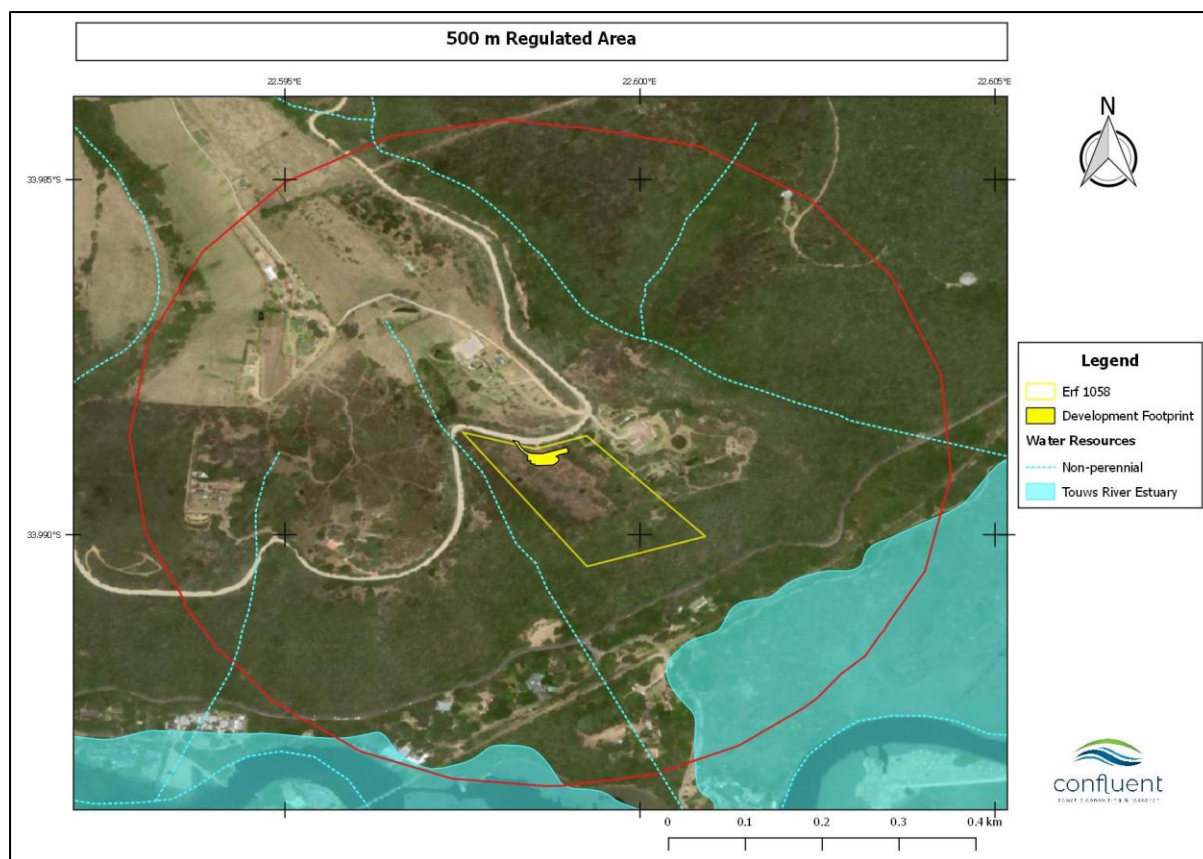


Figure 7: Map indicating the 500 m regulated area relative to the development footprint.

## 7. SENSITIVITY MAPPING

Buffer determination followed a conservative approach and did not consider the implementation of mitigation measures. The buffer is therefore appropriate for a worst-case development scenario, given the catchment and buffer characteristics which are summarised as follows:

- It was assumed that some form of erosion and sediment control will be implemented on site during the construction phase.
- Mean Annual Precipitation Class: 801 – 1000 mm.
- Rainfall Intensity: Zone 4.
- The inherent runoff potential of soil in the catchment area is low (A/B soils).
- Average slope of the rivers catchment is >11 %.
- Inherent erosion potential of the catchment soils is moderate (K factor 0.5 – 0.7).
- The slope of the buffer area is moderately steep (20 - 40 %).
- Interception characteristics of the vegetation is considered to be Poor (dominated by *A. mearnsii* with poor vegetation coverage beneath trees).

Based on these inputs the buffer for drainage line is set to 36 m. Any development that occurs within the buffer would be considered to be of a Very High sensitivity, while areas outside of the buffer are considered to be of a Low sensitivity. The development footprint (all structures and hard landscaping) falls entirely within the **Low** sensitivity area (Figure 8).

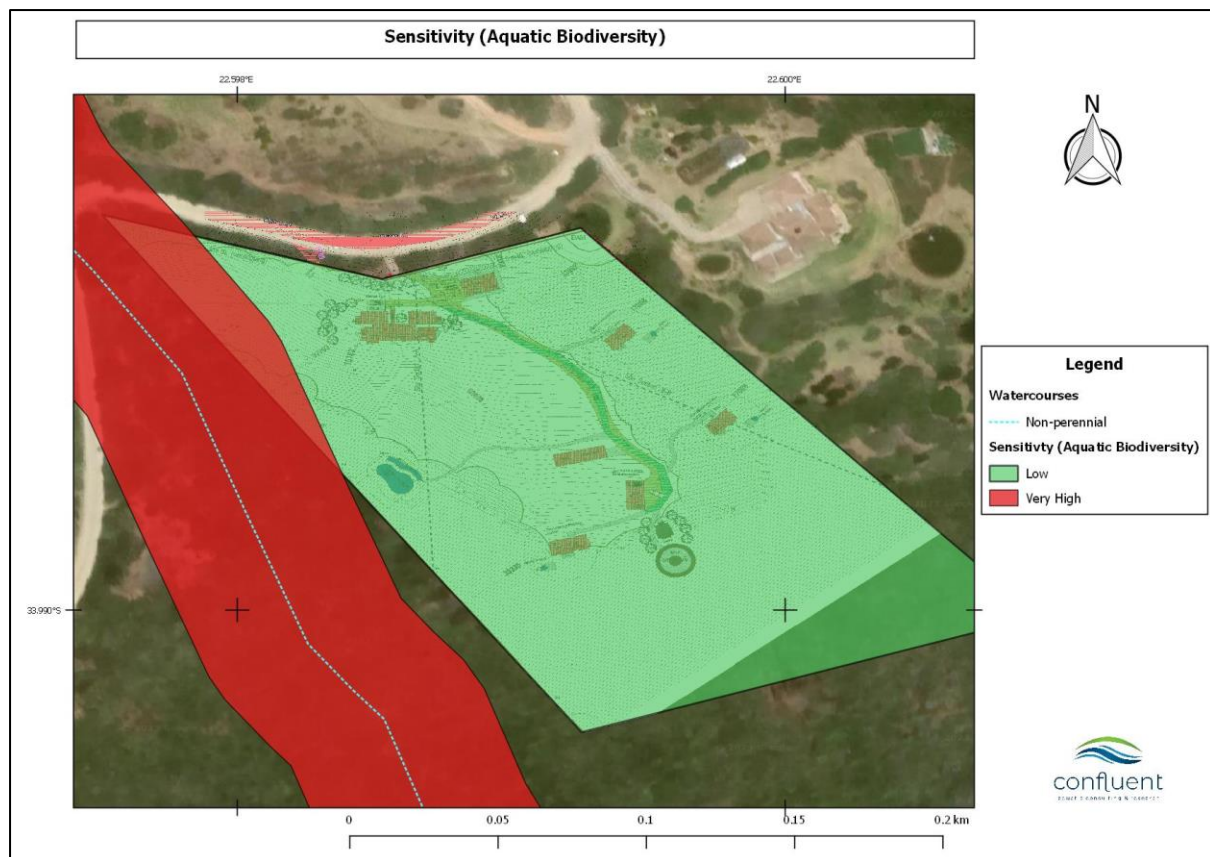


Figure 8: Map indicating the georeferenced development footprint in relation to aquatic biodiversity sensitivity.

## 8. MANAGEMENT RECOMMENDATIONS

### 8.1 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.

Given the location of the property in a FEPA and SWSA, 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.

## 8.2 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 9).



Figure 9: 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.

## 9. AQUATIC BIODIVERSITY COMPLIANCE STATEMENT

While the development is located within a FEPA and SWSA, the implementation of the proposed management recommendations, together with the implementation (and maintenance) of the recommended buffer will prevent impacts to aquatic biodiversity and the ability of the land to continue to produce high quantities of good quality water. Given that the entire footprint is located outside of the watercourse and its associated buffer, the sensitivity of aquatic biodiversity on the property can be regarded as **Low**.



## 10. REFERENCES

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