

FRESHWATER IMPACT ASSESSMENT AND RISK MATRIX FOR THE PROPOSED ABSTRACTION OF GROUNDWATER FROM PORTION 77 OF FARM 794, SOMERSET WEST, WESTERN CAPE

AUGUST 2026

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EXECUTIVE SUMMARY

The client, Thibault Investments, wishes to abstract groundwater from an existing borehole situated on Portion 77 of Farm 794, Somerset West, Western Cape (hereafter referred to as the property). This freshwater report was commissioned as part of the Water Use Licence Application (WULA) process to identify any existing freshwater constraints on and around the property. The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed area, determine their conservation value, and evaluate any impacts posed by the proposed activity.

The property is situated on the boundary between Somerset West and Strand within the greater City of Cape Town Metropolitan Municipality, immediately south of the N2. The broader project area has already been developed as a regional shopping centre, with very few natural landscape features remaining on the property itself.

Freshwater features that could potentially be affected by the proposed use of the existing borehole include the Geelsloot Stream and two seep wetlands identified through the desktop assessment (National Wetland Map Version 5). Based on the 2023 Western Cape Biodiversity Spatial Plan (WCBSP) (Figure 12), no terrestrial or aquatic Critical Biodiversity Areas (CBAs) occur on or adjacent to the property. Furthermore, according to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset (Figure 13), the broader catchment is not identified as a Freshwater Ecosystem Priority Area, and no FEPA wetlands occur on the property or within 500 m of the proposed abstraction point.

The property is situated within a Strategic Water Source Area (SWSA) for surface water and falls within the Lourens River catchment, specifically Quaternary Catchment G22J of the Berg Water Management Area.

Field verification, supported by historical aerial imagery and the desktop assessment, confirmed that only the Geelsloot Stream constitutes a natural freshwater feature requiring assessment in terms of Section 21(c) and (i) of the National Water Act (Act 36 of 1998). The larger seep wetland mapped to the north-east of the site was found to be a desktop mapping error, while the smaller seep mapped east of the borehole represents an artificial wet area associated with an overtopping stormwater channel and does not constitute a natural wetland.

The key findings of the freshwater assessment are summarised below:

	Geelsloot Stream
DWA catchment	G22J
Vegetation type	Lourensford Alluvium Fynbos (Critically Endangered)
Rainfall region	Winter
System	Inland System
Regional Setting	Southern Folded Mountains
Landscape unit	Plain

Hydrogeomorphic Unit	Stream (Seasonal)	
Longitudinal zonation/Landform/	Lowland - Sand Bed	
Substratum type	Sand	
Special conservational features (from desktop study)	**WCSBP (2023)**	Based on the 2023 WCBSP map, no terrestrial or aquatic Critical Biodiversity Areas (CBA's) were found around the abstraction point.
	NFEPA	According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5), the broader catchment in which the project site is located is not classified as a FEPA catchment, nor is the Geelsloot stream marked as a FEPA river.
PES	E/F: Seriously to Critically modified	
EIS	Low to Very Low	
RMO and REC	RMO – E/F* Maintain ; REC – D ***PES Categories E and F are considered ecologically unacceptable (Malan and Day, 2012) and therefore, should a freshwater resource fall into one of these PES categories, an REC class D is allocated by default, as the minimum acceptable PES category.**	
Proposed Buffer Zone	**N/a**	

The freshwater impact assessment identified the main potential impact as the indirect alteration of the hydrological regime of the Geelsloot Stream through a possible reduction in groundwater-supported baseflow. However, the accompanying geohydrological assessment concluded that the borehole abstracts water exclusively from the deeper secondary aquifer, which is separated from the shallow primary aquifer by a low-permeability clay aquitard. Consequently, hydraulic connectivity between the abstraction zone and the shallow groundwater system is expected to be minimal, substantially reducing the likelihood of any measurable impact on stream baseflow.

Furthermore, the downstream reaches of the Geelsloot Stream receive substantial inputs from the municipal stormwater network, further reducing the potential influence of groundwater abstraction on downstream flow volumes. **The potential impact on the hydrological regime of the Geelsloot Stream was therefore assessed as Low to Very Low, confined to a local spatial scale, with no significant residual impacts anticipated following implementation of the recommended mitigation measures.**

CONCLUSION

Based on the findings of both the freshwater and geohydrological specialist assessments, the proposed abstraction of groundwater from the existing borehole is **not expected to result in significant adverse impacts on the Geelsloot Stream or any surrounding freshwater ecosystems,** provided that the recommended mitigation and monitoring measures are implemented. The proposed groundwater abstraction is therefore considered environmentally acceptable from a freshwater ecological perspective.

Following the assessment of the characteristics of the identified aquatic habitats, the DWS Risk Assessment Matrix (which is specified in the Government Notice R509 of 2016 for section 21 (c) and

(i) water uses as defined under the NWA (1998)), was conducted to ascertain the significance of perceived impacts of the proposal on the key drivers and response processes (hydrology, water quality, geomorphology, habitat and biota) of the aquatic habitats. During both the operational phases of the development, impacts on the freshwater features resulted in a **Low-risk score**.

From a freshwater ecological perspective, there are no ecological constraints that preclude the authorisation of the proposed groundwater abstraction, subject to the implementation of the recommended mitigation and groundwater monitoring measures.

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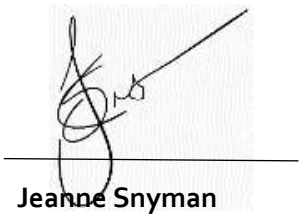
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DECLARATION OF INDEPENDENCE

I, **Jeanne Snyman,** declare that -

- I am subcontracted as a specialist consultant by PHS Consulting for input on the freshwater impacts related to activities associated with the proposed abstraction of water at the Helderberg Centre on Portion 77 of Farm 794, Somerset West, Western Cape.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority 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 the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.



Jeanne Snyman

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Glossary of Terms

Alluvial Material / deposits Sedimentary deposits resulting from the action of rivers, including those deposited within river channels, floodplains, etc.

Baseflow The component of river flow that is sustained from groundwater sources rather than from surface water runoff

Facultative Occurring optionally in response to circumstances rather than by nature; applied to wetland plants in this context – a facultative species is a species usually found in wetlands, but occasionally found in non-wetland areas

Herb A small non-woody plant in which the aerial parts die back at the end of every growing season

Herbaceous A plant having little or no woody tissue and persisting usually for a single growing season

Hydrology The scientific study of the distribution and properties of water on the earth's surface

Hydrogeomorphological zone An area defined by the interaction and linkage of hydrologic processes with landforms or earth materials and the interaction of geomorphic processes with surface and subsurface water in temporal and spatial dimensions

Hydrophyte A plant that grows in water or in conditions that are at least periodically deficient in oxygen as a result of saturation by water – these are typically wetland plants

Macrophyte An aquatic plant that grows in or near water. Macrophytic plants can be emergent, submerged, or floating

Marginal Plants and habitat on the edge of waterbodies

Obligate Hydrophyte A plant species that almost always occurs in wetlands (>99% of the time)

Pediment(ation) A gentle slope, cut into bedrock, occurring below a much steeper slope, extending at a flatter gradient down to a valley bottom.

Reach/ section A portion/stretch of a river

Riparian Zone The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas

Abbreviations

CBA –Critical biodiversity areas

DSP – Decision Support Protocol

DWAF - Department of Water and Forestry

EIS – Ecological Importance and Sensitivity

ELU – Existing Lawful Use

ESA – Ecological Support Areas

HGM (zone) – Hydrogeomorphological zone

NAEHMP – National Aquatic Ecosystem Health Monitoring Programme

NEMA – National Environmental Management Act

NFEPA – National Freshwater Ecosystem Priority Area

NWA – National Water Act

PES – Present Ecological State

REC – Recommended Ecological Class

RHP – River Health Programme

RMO – Recommended Management Objective

WCBSP – Western Cape Biodiversity Spatial Plan

WMA – Water Management Area

Introduction

The client, Thibault Investments, wishes to abstract groundwater from an existing borehole situated on Portion 77 of Farm 794, Somerset West, Western Cape (hereafter referred to as the property). This freshwater report was commissioned as part of the Water Use Licence Application (WULA) process to identify any existing freshwater constraints on and around the property. The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed area, determine their conservation value, and evaluate any limitations and opportunities presented to the proposed project.

Assumptions, Limitations, and Indemnity

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following limitations apply to the techniques and methodology utilised to undertake this study:

- The purpose of this report is to comment on the Present Ecological State (PES), Ecological Importance and Sensitivity (EIS), Ecoservices, Recommended Management Objectives (RMO's) and Recommended Ecological Class (REC's) of the freshwater features found within the project area.
- The determination of the watercourse boundaries and the assessment thereof is confined to the watercourses within the defined investigation area. Only the affected areas of the watercourses identified were delineated based on the findings of the field assessment undertaken by EverWater Freshwater Consulting on 19 May 2026, and in fulfilment of Government Notice 509 of 2016 as it relates to activities as stipulated in Section 21(c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). The larger surrounding freshwater system was delineated on a desktop level.
- Although the site visit was conducted at the start of the Western Cape wet season, site conditions were considered sufficient for the identification and delineation of wetland areas due to an abnormally early onset of rainfall, which commenced as early as March.
- The WET-health assessment was carried out using the South African Department of Water and Sanitation's developed methodologies. These assessments were carried out to provide information on the ecological condition, ecological importance, and sensitivity of the wetland systems impacted.
- Watercourses and terrestrial areas create transitional zones, or ecotones, where vegetation gradually shifts from terrestrial species to facultative and obligate freshwater species. Within these transition zones, there may be some variation in the opinion of the exact watercourse boundary. However, by applying the DWAF (2008) method, assessors should generally arrive at consistent and comparable results.

- The project deliverables, including the reported results, comments, recommendations and conclusions, are based on the author's professional knowledge as well as available information. Even though every care was taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time, and budget. Discussions and proposed mitigations are, to some extent, made on reasonable and informed assumptions built on *bona fide* information sources, as well as deductive reasoning. No biomonitoring or physicochemical aspects of the water found in the study were done.

- The author reserves the right to modify aspects of the report, including the recommendations, if and when new information becomes available from ongoing research or further work in this field or pertaining to this investigation.

- The author has exercised reasonable skill, care and diligence in the provision of services; however, accepts no liability or consequential liability for the use of the supplied project deliverables and any information or material contained therein. The client, including their agents, by receiving these deliverables, indemnifies EverWater Freshwater Consulting (including its members, employees and sub-consultants) against any actions, claims, demands, losses, liabilities, costs, damages and expenses arising directly or indirectly from or in connection with services rendered, directly or indirectly by EverWater Freshwater Consulting.

Key Legislative Requirements

National Water Act (Act No. 36 of 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. The National Water Act (NWA) (Act No. 36 of 1998) allows for the protection of water resources, which includes:

- The maintenance of the quality of the water resource to the extent that the water resources may be used in an ecologically sustainable way;
- The prevention of the degradation of the water resource; and
- The rehabilitation of the water resource.

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 a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

The NWA recognises that the entire ecosystem, and not just the water itself, and any given water resource constitutes the resource and as such needs to be conserved. No activity may therefore take place within a watercourse unless it is authorised by the DWS. For the purposes of this project, 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 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).

Proposed Classes of Water Resource and Resource Quality Objectives for the Berg River Catchment

In addition to the above legislation, the Department of Water and Sanitation has also released the proposed classes of water resources and Resource Quality Objectives for the Berg water management area in Government Notice 655 of Gazette 42451 published on 10 May 2019 in terms of section 13(4) of the NWA (1998).

For the G22J Catchment, which falls within the D7 Sir Lowry's zone, general RQOs as well as RQO's for RIVERS and ESTAURIES are applicable. RQO's specifically relating to the project would include those for the Lourens River and Lourens Estuary.

TABLE 1: SUMMARY OF WATER RESOURCE CLASSES PER INTEGRATED UNIT OF ANALYSIS AND ECOLOGICAL CATEGORIES

Integrated Unit of Analysis (IUA)	Water Resource Class for IUA	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	% nMAR*
D7 Sir Lowry's	II	G22J	D7-R18	Lourens	Bvii21	D	114
		G22K	D7-R19	Sir Lowry's Pass*	Bviii9	C	84
		G40A	D7-R20	Steenbras	Bvii22	B/C	81
		G22J	**D7-E07**	**Lourens**	**Bxi4**	**D**	**85**

TABLE 2: RESOURCE QUALITY OBJECTIVES FOR RIVERS IN PRIORITY RESOURCE UNITS IN THE INTEGRATED UNIT OF ANALYSIS D7 SIR LOWRYS

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric												
D7 Sir Lowry's	II	G22J	D7-R18	Lourens River	Bvii21	D	Quantity	Low flows High flows	Maintenance low flows Maintenance high flows	Flows sufficient to maintain the river in a D category	Months		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
											Maintenance flows (million cubic metres)	Low	0.523	0.448	0.277	0.151	0.108	0.100	0.141	0.254	0.410	0.520	0.592	0.568
												High	0.355	0.063	0.000	0.000	0.000	0.000	0.000	0.563	1.007	1.463	0.297	0.593
							Quality	Nutrients	Phosphate (PO_4-P)	Nutrient levels must be maintained in the river at a mesotrophic or better condition.	≤ 0.075 milligrams/litre (50th percentile)												
									Total inorganic nitrogen (TIN)		≤ 1.75 milligrams/litre (50th percentile)												
								Salts	Electrical conductivity (EC)	Salt concentrations need to be maintained at present day levels.	≤ 55 milliSiemens/metre (95th percentile)												
								System variables	pH range	pH, temperature, and dissolved oxygen are important for the maintenance of ecosystem health.	6.5 ≤ pH ≤ 8.5 (5th and 95th percentiles)												
									Water temperature		2°C difference from ambient water temperature												
									Dissolved oxygen		≥ 6 milligrams litre (5th percentile)												
								Toxins	Ammonia	Toxicity levels must not pose a	≤ 0.073 milligrams per litre (95th percentile)												

TABLE 3: RESOURCE QUALITY OBJECTIVES FOR ESTUARIES IN PRIORITY RESOURCE UNITS IN THE INTEGRATED UNIT OF ANALYSIS D7 SIR LOWRY'S

IUA	Class	Quaternary Catchment	RU	Resource Name	Biophysical Node Name	TEC	Component	Sub-component	Indicator	RQO Narrative	RQO Numeric													
D7 Sir Lowry's	II	G22J	D7-E07	Lourens Estuary	Bxi4	D	Quantity	Surface flow	Flow	Freshwater inflow adequate to maintain water quality and habitat suitable for flora and fauna	Months		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
											MMR/MAR (% Nat)		83 %	56 %	27 %	16 %	10 %	18 %	35 %	49 %	78 %	89 %	90 %	88 %	76 %
							Quality	Nutrients	DIN	Inorganic nutrient concentrations not to exceed TPCs for macrophytes and microalgae	River inflow: <350 µg.l^{-1}													
											Lower estuary: <300 µg.l^{-1}													
									DIP		River inflow: <80 µg.l^{-1}													
											Lower estuary: <80 µg.l^{-1}													
								Salinity	Salinity	Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae	Average salinity in lower estuary >15, maximum = 35												
								System variables	Dissolved oxygen	System variables not to exceed TPCs for biota	>4 mg.l^{-1}												
								Pathogens	Enterococci	Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation	≤185 Enterococci/100 ml) (90th percentile, hazen system)												
									Escherichia coli		≤500 E. coli/100 ml (90th percentile, hazen system)												
							Habitat	Hydrodynamics	Mouth state	Habitat health adequate for microalgae, macrophytes, invertebrates, fish, birds and recreational use	Permanently open												
									Tidal variation		<10% change from present state													
								Sediments	Sediment characteristics, Channel shape/size		Bathymetry and sediment MdØ change <10% from baseline													
							Biota	Microalgae	Biomass and community composition of phytoplankton and benthic microalgae community	Phytoplankton biomass and composition suitable for invertebrates, fish, birds and recreational use	Maintain low phytoplankton biomass (chlorophyll- a < 20 µg/ℓ) and a diversity of phytoplankton groups.													
								Macrophytes	Extent, distribution and richness of macrophytes	Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use	Restore and maintain the distribution and area cover of macrophyte habitats particularly salt marsh												

National Environmental Management Act (Act No. 107 of 1998)

The National Environmental Management Act (NEMA) (Act 107 of 1998) and the associated Regulations, as amended in April 2017, state that prior to any development taking place within a wetland or riparian area, an environmental authorisation process needs to be followed. This could

follow either the Basic Assessment Report (BAR) process or the Environmental Impact Assessment (EIA) process, depending on the scale of the impact.

Background

Site location and regional description

The property is situated on the boundary between Somerset West and Strand within the greater City of Cape Town Metropolitan Municipality, immediately south of the N2. The broader project area has already been developed as a regional shopping centre, with very few natural landscape features remaining on the property itself. The Geelsloot Stream, which has been incorporated into the municipal stormwater system, runs along the south-eastern and southern boundaries of the property. Downstream of the site, the stream converges with several stormwater channels before ultimately discharging into the Lourens River, which is located approximately 850 m south of the property. The Lourens River subsequently discharges into False Bay just north of Melkbaai.

Furthermore, two wetland features have been identified through the desktop assessment within 500 m of the proposed abstraction point, and the property is situated within a Strategic Water Source Area (SWSA) for surface water. Regionally, the site falls within the Lourens River catchment, specifically Quaternary Catchment G22J of the Berg Water Management Area.

Other significant landscape features include the Hottentots Holland Mountain Range to the far east, while the Helderberg forms a prominent topographical feature to the north-east of the site.

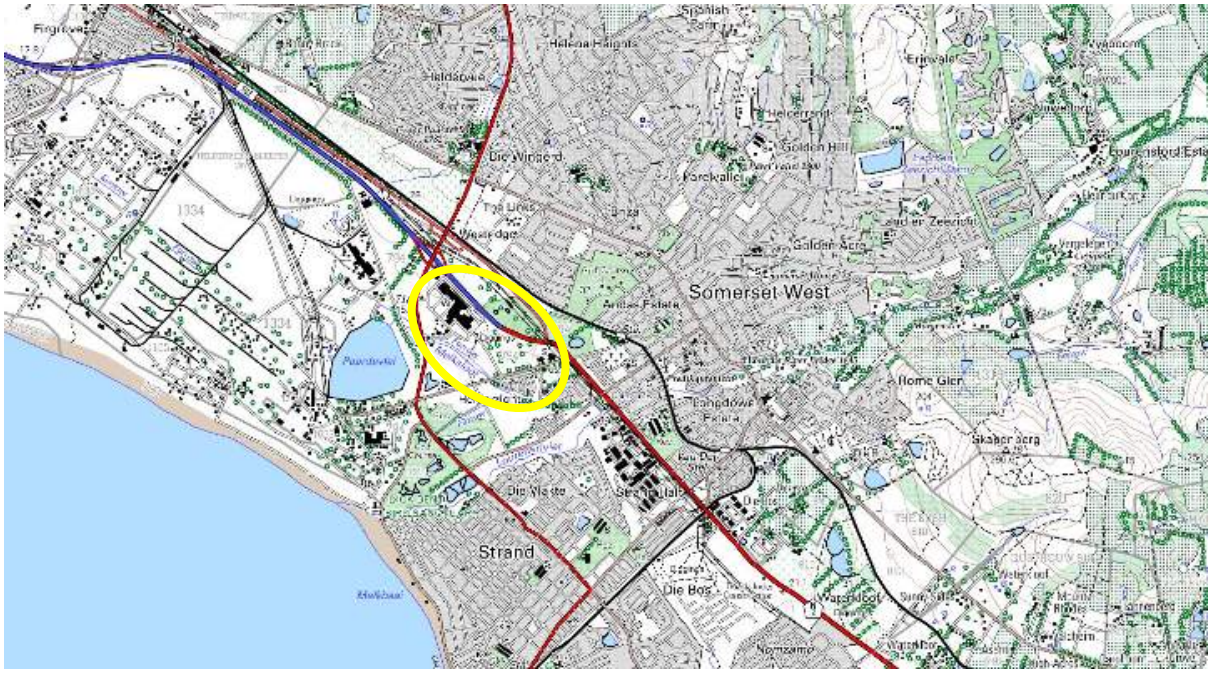


Figure 1: 1:50 000 Topographical map of the area with the project location (3418BB)

Proposed Activity

As previously mentioned, the client intends to abstract approximately 2,200 kL of groundwater per month from an existing, currently non-operational borehole located in the south-western corner of the property. The proposed abstraction volume exceeds the General Authorisation threshold applicable to the quaternary catchment. Consequently, a full Water Use Licence Application (WULA) will be submitted in terms of the National Water Act (Act 36 of 1998).



Figure 2: The property boundary (red polygon), with the existing borehole location.

Historical and current land use

The project site forms part of the larger Helderberg Centre development, comprising a large retail building and an extensive parking area to the south-west of the property. The shopping centre was constructed in 2013, prior to which the site consisted predominantly of agricultural land, presumably used for pastures.

According to the National Land Cover Map (Figure 4), the existing borehole is situated within an area classified as Built-up (Residential) (yellow area in Figure 4), while the majority of the shopping centre is classified as Built-up (Commercial) (orange area in Figure 4). The large open area to the east of the property is classified as Built-up (Urban Vegetation) (bright green area in Figure 4).

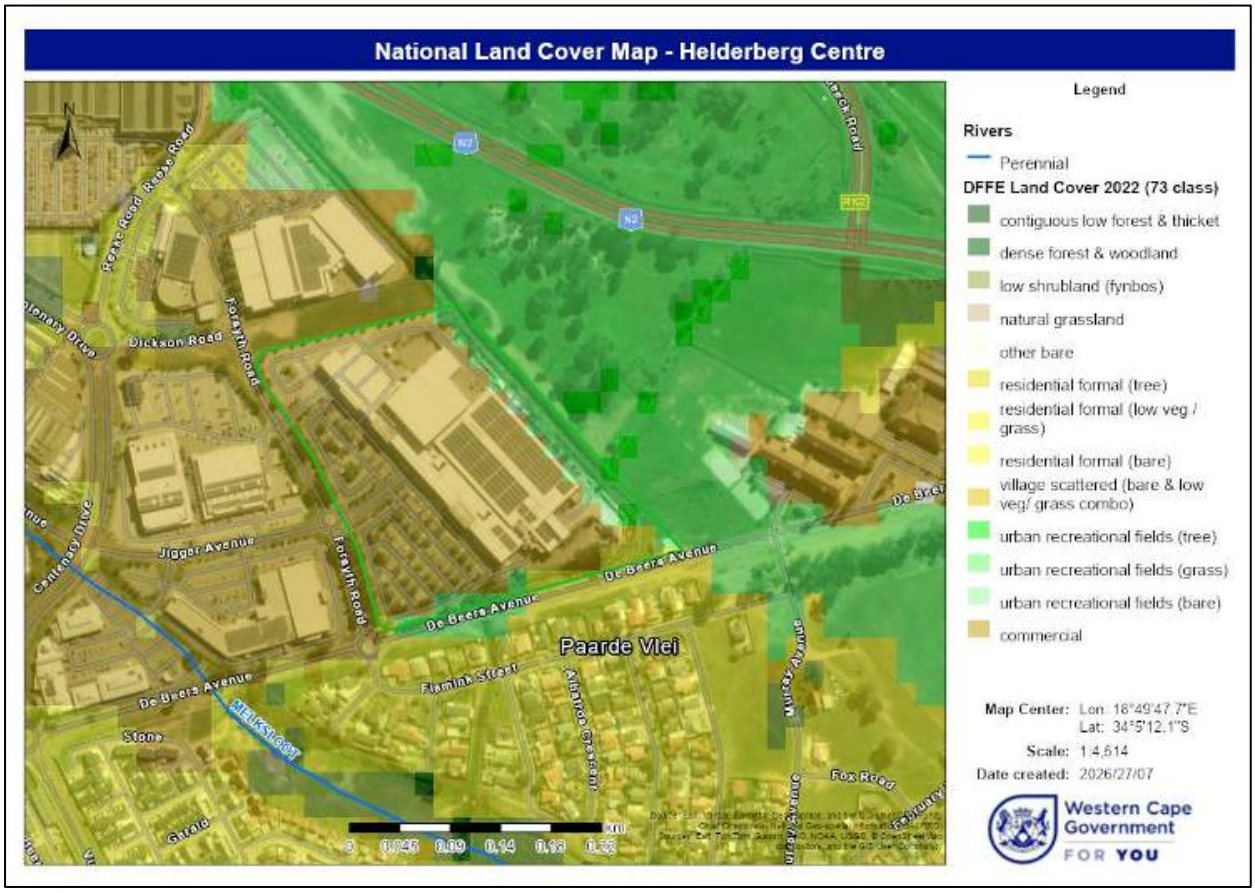


Figure 3: National land cover map (2014) covering the larger area (CFM, 2026)

Historical aerial photography of South Africa (1926–2008) was used as reference imagery (accessed July 2026) to assess historical land use and identify any historical wet areas. Imagery from 1938 represents the earliest available clear coverage of the affected area and was used to evaluate historical land use, determine whether the site had been extensively altered in the past, and identify any significant changes in land use within the catchment. The imagery was also used to identify areas where aquatic ecosystems may have occurred historically.

The 1938 imagery (Figure 4) indicates that the broader area had already been converted to agricultural land prior to this date. With respect to freshwater features, the Geelsloot Stream is clearly visible in approximately the same alignment as at present (apart from being diverted around the current property), although evidence of historical channel straightening and modification is already apparent. **No wet areas are visible at the location of the wetland mapped immediately east of the borehole (yellow circle in Figure 5), and no other wetland features are discernible within the broader landscape.**



Figure 4: 1938 aerial photography covering the property and the broader surrounding area, with only the Geelsloot Stream being clearly visible.

Comparison of the 1938 imagery with aerial photography from 1994 (Figure 5) indicates that the alignment of the Geelsloot Stream remained largely unchanged. By 1994, Danie Ackerman Primary School, Gordon High School, and the N2 had been constructed. **The imagery also clearly shows a stormwater channel conveying stormwater from the school boundary into the Geelsloot Stream at the same location as the wetland feature identified through desktop mapping. No additional wetland features are visible within 500 m of the proposed abstraction point.**



Figure 5: 1994 aerial photography covering the property and the broader surrounding area, with only the Geelsloot Stream and stormwater channel being clearly visible.

Looking at satellite imagery from 2005 to 2026 (Figure 6), Geelsloot Stream has been progressively modified and incorporated into the City of Cape Town's broader stormwater management system over time. The stream has been diverted around the Helderberg Centre development, with several additional stormwater channels formalised to discharge into it. One of these channels corresponds with the channel visible in the 1994 imagery, entering the Geelsloot Stream immediately east of the property from the western boundary of Danie Ackerman Primary School. A second channel drains runoff from the upstream portion of the former Somerset West Golf Course.

Interestingly, wetland characteristics adjacent to the smaller stormwater channel only become evident following the construction of the Helderberg Centre (post 2013). This may be attributable to changes in local hydrology associated with the development, such as soil compaction reducing infiltration, or reduced maintenance of the stormwater channel leading to overtopping during high-flow events. Although imagery strongly suggests its artificial nature, the available imagery, however, does not allow the exact cause of these changes to be determined.

Lastly looking at the mapped wetland located to the north-east of the property (turquoise polygon in figure 6), no wetland features or evidence of persistent subsoil water movement are visible throughout the period of available aerial and satellite imagery at the location identified through desktop mapping as a depression wetland. This suggests that the mapped feature is unlikely to represent a naturally occurring wetland and is more likely to reflect a desktop mapping artefact.





Figure 6: Google Earth Satellite imagery of the project site in 2005 (top), 2011 (middle) and 2022 (bottom), showing the property boundary (red polygon) in relation to the Geelsloot Stream, (Blue line), other stormwater channels (orange lines) and artificially wet area (green polygon) (Google Earth, 2026).

Climatic conditions of the site

Somerset West's climate is classified as warm and temperate. The area normally receives about 782mm of rain per year and because it receives most of its rainfall during winter, it has a Mediterranean climate. The chart below shows the average rainfall and temperature values for Somerset West per month for the average climatic conditions. It received the lowest rainfall (9,9 mm) in January and the highest (125,8 mm) in June. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Somerset West ranged from 16°C in

July to 26°C in January/February. The region is the coldest during July when the mercury dropped to 9°C on average during the night.

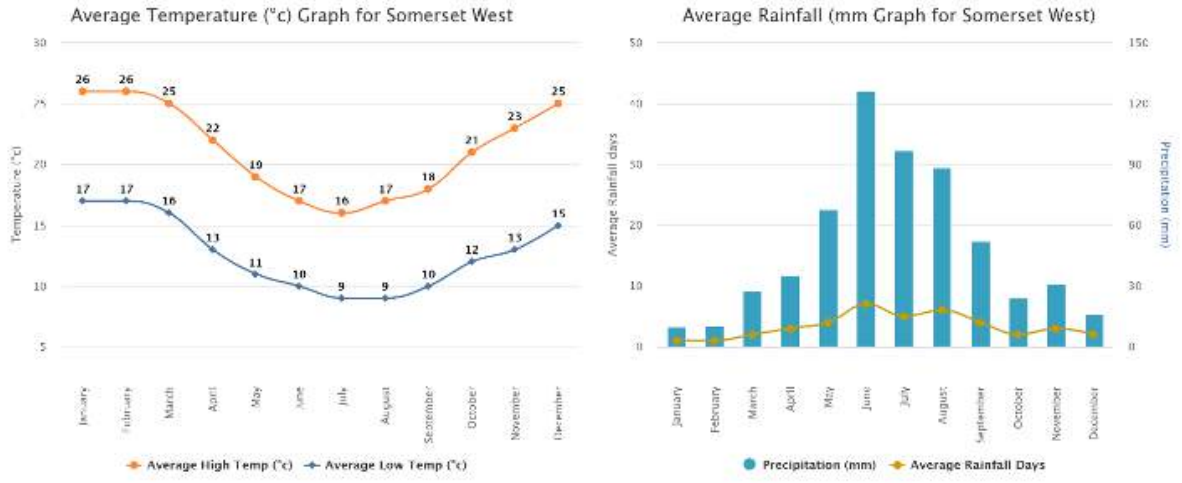


Figure 7: Climate graphs for the Somerset West area (World Weather Online, 2026)

Flora and Fauna

Flora

Vegetation associated with the project site is largely classified as Lourensford Alluvium Fynbos (represented by the pink area in Figure 8), which is listed **as a Critically Endangered vegetation** type. The property itself, together with the adjacent developed areas, has, however, been entirely cleared of its indigenous vegetation through historical agricultural activities and subsequent urban development, resulting in the complete transformation of the original vegetation matrix.

Field observations indicated that the vegetation associated with the artificial channel linked to the Geelsloot Stream, along the south-eastern boundary of the property, is dominated by the pioneer species *Typha capensis* (bulrush), together with the introduced garden escapee *Tropaeolum majus* (nasturtium). The artificially wet area associated with the smaller stormwater channel similarly supports stands of *Typha capensis* within the permanently wetter portions of the channel, while *Cenchrus macrourus* (African feather grass) and *Zantedeschia aethiopica* (arum lily) occur within the seasonally inundated sections. The surrounding area is otherwise dominated by the alien invasive kikuyu grass (*Cenchrus clandestinus*) and scattered Port Jackson (*Acacia saligna*) trees.

No obligate or facultative wetland vegetation was recorded within the larger depression located to the north-east of the site.

Fauna

No wetland-dependent fauna were observed during the field assessment in association with any of the surrounding wet areas.



Figure 8: National vegetation map for the project site (CFM, 2026).



Figure 9: Typical vegetation around the Geelsloot Stream.



Figure 10: View over the smaller stormwater channel and artificially wet area.



Figure 11: View over the larger mapped Wetland seep.

Conservation Value

The 2023 Western Cape Biodiversity Spatial Plan Map and the National Freshwater Ecosystem Priority Areas Map provide information regarding the conservation value and ecological importance of the freshwater features studied.

2023 Western Cape Biodiversity Spatial Plan

The 2023 Western Cape Biodiversity Spatial Plan (WCBSP) was formally adopted into law on 13 December 2024 (Gazette Extraordinary No. 9017), in terms of the Western Cape Biodiversity Act (Act

No. 6 of 2021). This plan supersedes the 2017 WCBSP and now serves as the official spatial framework for biodiversity conservation and land-use decision-making in the province.

Based on the 2023 WCBSP map (Figure 12), no terrestrial or aquatic Critical Biodiversity Areas (CBA's) were found either on or around the property.

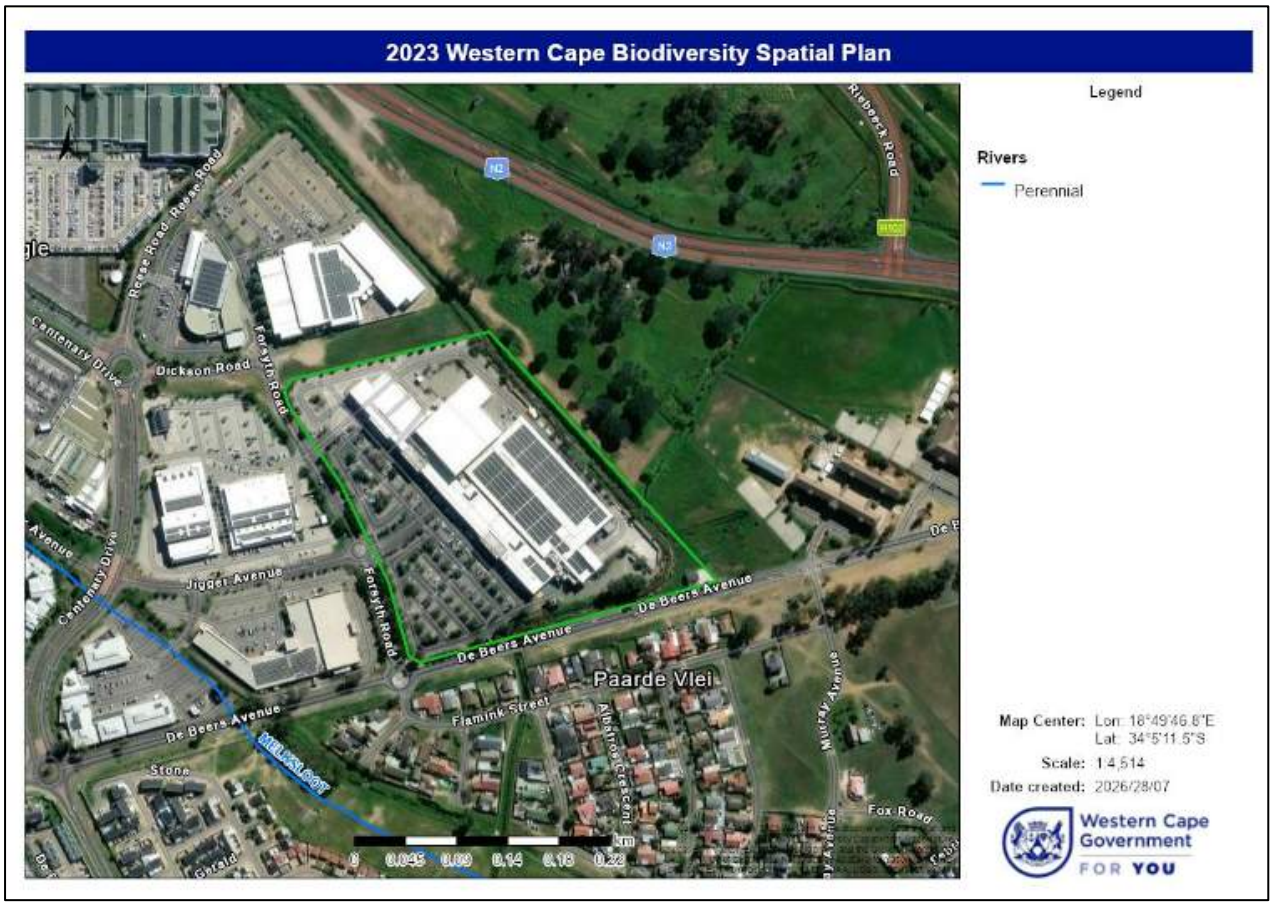


Figure 12: 2023 Western Cape Biodiversity Spatial Plan for the project site (green polygon) (CFM, 2026).

NFEPA map

Freshwater Ecosystem Priority Areas (FEPAs) are strategic spatial priority areas identified to support the long-term conservation of freshwater ecosystems and the sustainable management of water resources. According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset (refer to Figure 13), the broader catchment within which the project site is situated is not classified as a FEPA area, and no FEPA wetlands occur on the property or within 500 m of the proposed abstraction point.

The National Wetland Map Version 5 (NWM5) identifies two seep wetlands on and within 500 m of the property, both classified as Southwest Fynbos Wetland Seeps with a conservation status of Vulnerable and a protection level of Well Protected. The first is mapped along the smaller stormwater channel, extending partially onto the property, while the second is located to the north-east of the site.

Based on the historical aerial imagery, desktop assessment and field verification, the seep mapped to the north-east of the site was found to be invalid. No evidence of hydrophytic vegetation or wetland hydrology was observed to support its classification as a natural seep wetland. Similarly, the seep mapped along the stormwater channel is considered to be artificial in origin, having developed in response to altered stormwater drainage patterns rather than representing a naturally occurring freshwater ecosystem.

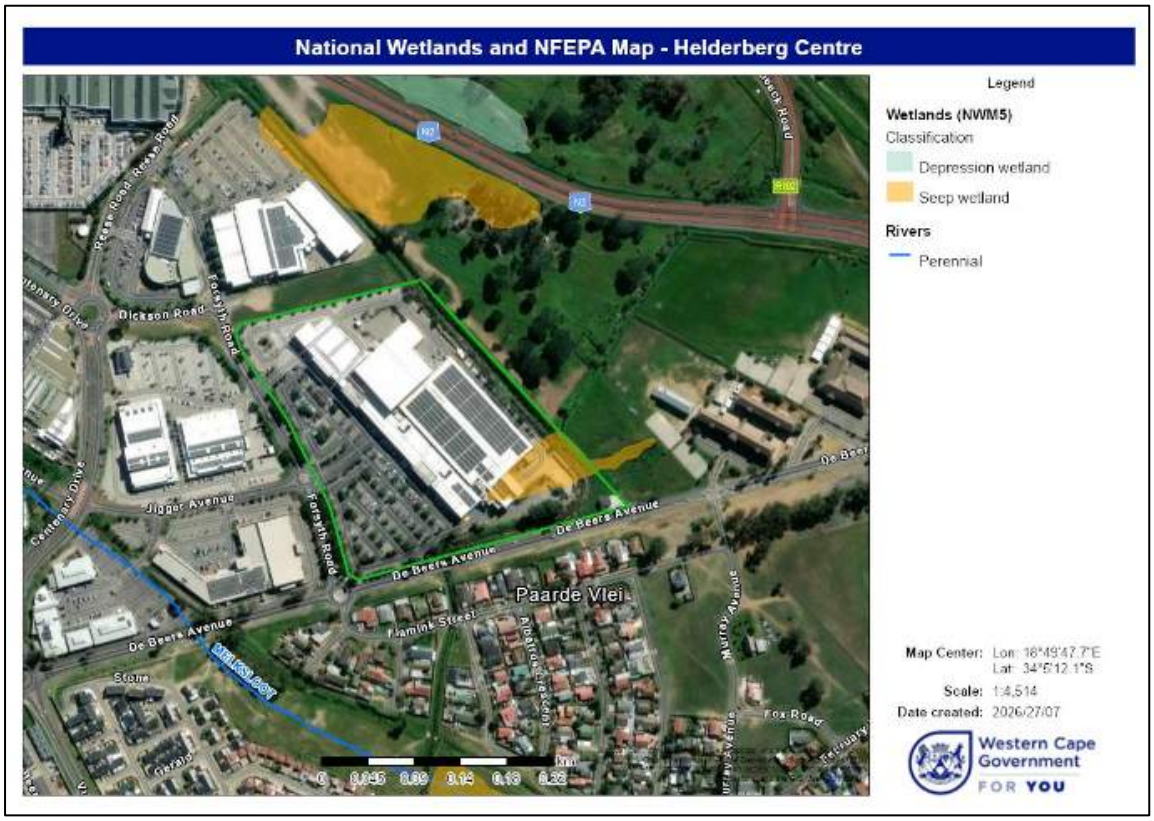


Figure 13: NFEPA and NWM5 map for the larger area surrounding the project site (green polygon) (SANBI GIS, 2026).

Aquatic assessment

Description of the freshwater features

The ecosystem and vegetation of the study area were assessed in its present, as well as its likely pre-expanded and historical composition. It is described in the context of the freshwater systems of the area as assessed at the middle of the wet season, with the site visit done on 28 July 2026. Considering that the site visit was conducted in the middle of the rainy season, these conditions are ideal for identification of both seasonal and permanent freshwater features.



Figure 14: Satellite imagery indicating the project site and abstraction point (yellow pin) in relation to the surrounding features.

Geelsloot Stream:

The Geelsloot Stream, is a seasonal stream that drains the south-western slopes of the Helderberg Mountain and becomes extensively modified and canalised through the upstream urban environment. The stream is diverted through a network of highly modified stormwater canals and channels associated with the existing and former sections of the Somerset West Golf Course, with the main stem still flowing westwards towards the Helderberg Centre, where it is diverted around the property edge and joins the downstream stormwater system. Further downstream, the canalised stream passes through the urban area and the Strand Golf Club before discharging into the Lourens River, approximately 400 m upstream of its mouth at False Bay.

The section flowing around the property, can be classified as being in a seriously to critically modified state, now consisting of an earthen canal with no remaining natural features. The banks consist of gabions on both sides, with only limited pioneer vegetation found on the sides. The channel is also periodically cleared as part of the City's maintenance plan. Flow was very low at the time of the field

assessment. The area is otherwise polluted with rubbish washed down from upstream areas and no significant fauna dependant on this stream section was observed.

TABLE 4: SUMMARY OF THE RIVER ASSESSMENT FOR THE GEELSLOOT STREAM

	Geelsloot Stream	
DWA catchment	G22J	
Vegetation type	Lourensford Alluvium Fynbos (Critically Endangered)	
Rainfall region	Winter	
System	Inland System	
Regional Setting	Southern Folded Mountains	
Landscape unit	Plain	
Hydrogeomorphic Unit	Stream (Seasonal)	
Longitudinal zonation/Landform/	Lowland - Sand Bed	
Substratum type	Sand	
Special conservational features (from desktop study)	**WCSBP (2023)**	Based on the 2023 WCBSP map, no terrestrial or aquatic Critical Biodiversity Areas (CBA's) were found around the abstraction point.
	NFEPA	According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5), the broader catchment in which the project site is located is not classified as a FEPA catchment, nor is the Geelsloot stream marked as a FEPA river.
PES	E/F: Seriously to Critically modified	
EIS	Low to Very Low	
RMO and REC	RMO – E/F* Maintain ; REC – D ***PES Categories E and F are considered ecologically unacceptable (Malan and Day, 2012) and therefore, should a freshwater resource fall into one of these PES categories, an REC class D is allocated by default, as the minimum acceptable PES category.**	
Proposed Buffer Zone	**N/a**	

Wetland features:

As previously mentioned, two seep wetlands were identified during the desktop assessment based on the National Wetland Map (NWM5). The first comprises a smaller seep mapped immediately east of the proposed abstraction point, while the second is a larger seep mapped to the north-east of the property.

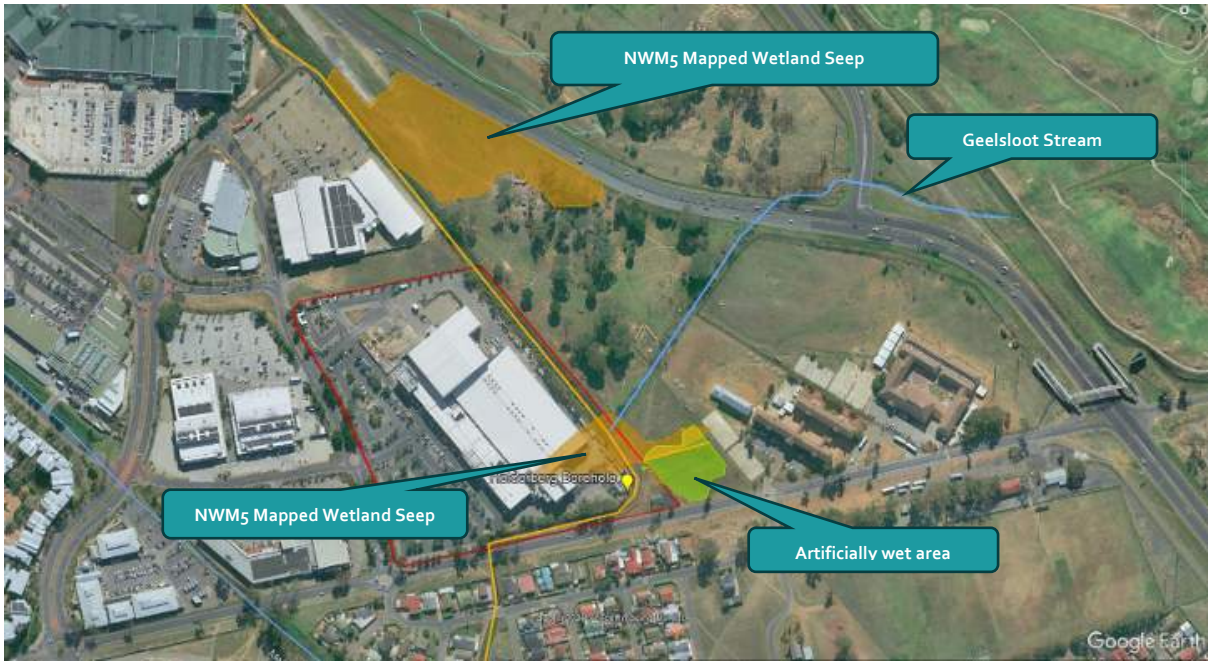


Figure 15: Satellite imagery indicating the project site and abstraction point (yellow pin) in relation to the two mapped wetland areas (orange polygons) and the actual extent of the current artificially wet area (green polygon).

During the field assessment, no evidence of wetland characteristics was observed at the location of the larger seep mapped to the north-east of the site. The area exhibited no indicators of wetland hydrology or hydrophytic vegetation to support its classification as a natural wetland.



Figure 16: View over the larger mapped Wetland seep, looking in a south-western direction from the N2 freeway.

The field assessment further confirmed that the smaller mapped seep is associated with a poorly maintained stormwater channel that periodically overtops towards De Beers Avenue, resulting in a localised artificially inundated area. As described under "*Flora and Fauna*", the vegetation within this

area is dominated by *Typha capensis* (bulrush) within the channel itself, while *Cenchrus macrourus* (African feather grass) and *Zantedeschia aethiopica* (arum lily) occur along the seasonally wet margins. The surrounding area is otherwise dominated by the alien invasive kikuyu grass (*Cenchrus clandestinus*) and scattered Port Jackson (*Acacia saligna*) trees.

As described under "*Historical and current land use*", the historical aerial imagery provides no evidence of a naturally occurring wetland at this location. Instead, the wet area only becomes evident following construction of the Helderberg Centre development after 2013, indicating that it developed in response to altered stormwater drainage patterns rather than representing a naturally occurring seep wetland.



Figure 17: View over the smaller mapped Wetland seep, looking in a north-eastern direction from the corner of the property.

Based on the combined findings of the desktop assessment, historical aerial imagery and field verification, the larger seep mapped to the north-east of the property is considered to be an erroneous desktop mapping artefact, while the smaller mapped seep is considered to be an artificial wet area associated with stormwater infrastructure. Neither feature therefore constitutes a natural freshwater ecosystem requiring assessment under Section 21(c) and (i) of the National Water Act. Consequently, both mapped seep wetlands were excluded from the freshwater impact assessment.

Impact Assessment

The freshwater impacts are rated in accordance with the Environmental Impact Assessment Regulations, 2010 and the criteria drawn from the IEM Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the (DEAT, 2006), as well as the Guideline Document on Impact Significance (DEAT, 2002).

As with any development activity within a natural system, such activity will give rise to potential impacts, either positive or negative, on the surrounding environment. In this section, the significance of the existing and potential impacts related to the project on the freshwater ecology at the site, as well as on downstream freshwater features, is assessed. In addition to that, a description of mitigation measures needed to limit the negative impacts was formulated, as well as the significance of the impacts, assuming that the mitigation measures are implemented in full, is assessed.

As the proposed development involves the use of an existing borehole, the only project activity with the potential to impact freshwater resources is the proposed abstraction of groundwater that could potentially have an indirect impact on the Geelsloot Stream and its aquatic function.

These activities might impact on the following:

- Potential hydrology modification and subsequent loss of biodiversity, aquatic habitat and ecological structure.

Potential Impact – Flow modification and hydrology.

A geohydrological assessment was undertaken by H2 Consulting (Pty) Ltd in July 2026 to evaluate the potential impacts of the proposed groundwater abstraction on the surrounding aquifer system and associated freshwater ecosystems. The assessment determined that the existing borehole (HBC_BH1) has a total depth of 40.2 m and is fitted with 110 mm uPVC casing. The borehole is interpreted to penetrate unconsolidated sand and clay overlying semi-weathered shale. The overlying sand and clay sequence is understood to have been sealed off with steel casing, resulting in groundwater being abstracted exclusively from the deeper secondary aquifer.

The geohydrological assessment identified two distinct aquifer systems underlying the site, namely a shallow primary aquifer and a deeper secondary aquifer, separated by a clay layer that acts as an aquitard, thereby significantly limiting hydraulic connectivity between the two groundwater systems. As the borehole was specifically constructed to target the secondary aquifer, abstraction is not expected to induce drawdown within the shallow primary aquifer that supports near-surface hydrological processes.

Based on these findings, H2 Consulting concluded that groundwater abstraction from the borehole is unlikely to adversely affect the Geelsloot Stream, as the proposed abstraction will occur from the hydraulically isolated secondary aquifer. **It can therefore be concluded that the impact on hydrology within the surrounding section of the Geelsloot stream will be negligible to none.**

Furthermore, given the limited hydraulic connectivity between the secondary aquifer and the surface water system, together with the contribution of several stormwater channels to the downstream reaches of the Geelsloot Stream, **any potential reduction in downstream flows resulting from the proposed groundwater abstraction is expected to be negligible.**

Mitigation measures:

Although the potential impact of the proposed groundwater abstraction on the hydrological regime of the Geelsloot Stream is considered to be negligible, the geohydrological assessment recommended several mitigation measures to minimise drawdown within the secondary aquifer and to ensure the sustainable management of the groundwater resource. The implementation of these measures will further reduce the likelihood of any indirect impacts on the Geelsloot Stream and associated freshwater ecosystems.

Operational Phase

- Restrict groundwater abstraction to the recommended pumping rate of **2.2 L/s for 12 hours per day** (approximately **95 m³/day**) from the recommended pump intake depth of **35 m below ground level (mbgl)**.
- Implement a groundwater monitoring programme to monitor groundwater levels, groundwater quality, and abstraction volumes.
    - Equip the borehole with a slotted conduit pipe (**35 mm internal diameter Class 6 HDPE pipe**) attached to the pump rising main and installed to approximately **1 m above the pump inlet** to facilitate water level monitoring.
    - Record groundwater levels and abstraction volumes at least **monthly**. Where feasible, automatic flow meters and water level loggers should be installed to record hourly measurements, thereby providing a more comprehensive monitoring dataset.
    - Appoint a **SACNASP-registered hydrogeologist** to review the monitoring data annually and compile an annual groundwater monitoring report. The report should evaluate groundwater trends, assess the sustainability of the abstraction, and recommend corrective actions where necessary.

Summary of the expected impacts:

TABLE 5: SUMMARY OF THE EXPECTED IMPACTS RELATING TO THE OPERATION PHASE.

OPERATIONAL PHASE		
	Preferred Alternative	
Nature of impact:	Operation of the borehole on site.	
Description and consequence of impact or risk:	The most significant impact during the operational phase is expected to be the possibility of a change in groundwater contribution to the Geelsloot stream's baseflow.	
Indirect impacts:	Resulting of indirect loss of biodiversity, aquatic habitat and ecological structure.	
	Without mitigation	**With mitigation**
MAGNITUDE of impact:	**Low to negligible (-)** This impact could result in minimal alteration of the aquatic function and processes within the Geelsloot stream.	**Negligible to none (-)** Natural functioning of the current environment is left undisturbed.
DURATION:	**Long term**	

OPERATIONAL PHASE		
	Preferred Alternative	
	This impact would persist for the duration of the operational life of the borehole.	
EXTENT (special scale/ influence of impact):	**Local** Impacted area extends to the site and its immediate surrounding area.	
IRREPLACEABLE loss of resources:	**Low potential** No irreplaceable resources will be impacted.	
INTENSITY and degree to which the impact can be REVERSED:	**Low to Negligible** Natural functioning of the environment is minimally affected. Natural processes can be reversed to their pre-operation state.	
PROBABILITY of occurrence:	**Low probability** There is a low probability that the impact will occur	**Low to very low probability** There is a low to very low probability that the impact will occur
Significance rating of impact <u>without and with</u> mitigation:	**Low to negligible(-)** The overall significance of the above potential impact is predicted to be Low to negligible, without mitigation. Impacts fall within an acceptable range and no further mitigation measures are required to reduce the negative impacts.	**Negligible to None (-)** This impact would result in a very limited change in the aquatic function within affected freshwater features.
Cumulative impact:	**Negligible negative impact on the downstream freshwater system**	

Results and recommendations

Freshwater features that could potentially be affected by the proposed use of the existing borehole include the Geelsloot Stream and two seep wetlands identified through the desktop assessment (National Wetland Map Version 5). Based on the 2023 Western Cape Biodiversity Spatial Plan (WCBSP) (Figure 12), no terrestrial or aquatic Critical Biodiversity Areas (CBAs) occur on or adjacent to the property. Furthermore, according to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset (Figure 13), the broader catchment is not identified as a Freshwater Ecosystem Priority Area, and no FEPA wetlands occur on the property or within 500 m of the proposed abstraction point.

The property is situated within a Strategic Water Source Area (SWSA) for surface water and falls within the Lourens River catchment, specifically Quaternary Catchment G22J of the Berg Water Management Area.

Field verification, supported by historical aerial imagery and the desktop assessment, confirmed that only the Geelsloot Stream constitutes a natural freshwater feature requiring assessment in terms of Section 21(c) and (i) of the National Water Act (Act 36 of 1998). The larger seep wetland mapped to the north-east of the site was found to be a desktop mapping error, while the smaller seep mapped east of the borehole represents an artificial wet area associated with an overtopping stormwater channel and does not constitute a natural wetland.

The ecological assessment assigned the Geelsloot Stream a Present Ecological State (PES) of **Category E/F, indicating a Seriously to Critically Modified system**. This finding is consistent with the extensive historical modification of the stream through channelisation, bed alteration and incorporation into the municipal stormwater network. Owing to the highly transformed nature of the surrounding catchment, the stream was also assigned a **Low to Very Low Ecological Importance and Sensitivity (EIS) rating.**

Although the stream is currently in a Category E/F ecological condition, these categories are considered ecologically unacceptable (Malan & Day, 2012). In accordance with the Resource Directed Measures framework, the minimum Recommended Ecological Category (REC) for the **Geelsloot Stream is therefore Category D**. As the proposed development entails the continued use of an existing borehole and no new infrastructure is proposed within or adjacent to the watercourse, the application of a freshwater buffer is not considered necessary.

The freshwater impact assessment identified the principal potential impact as the indirect alteration of the hydrological regime of the Geelsloot Stream through a possible reduction in groundwater-supported baseflow. However, the accompanying geohydrological assessment concluded that the borehole abstracts water exclusively from the deeper secondary aquifer, which is separated from the shallow primary aquifer by a low-permeability clay aquitard. Consequently, hydraulic connectivity between the abstraction zone and the shallow groundwater system is expected to be minimal, substantially reducing the likelihood of any measurable impact on stream baseflow.

Furthermore, the downstream reaches of the Geelsloot Stream receive substantial inputs from the municipal stormwater network, further reducing the potential influence of groundwater abstraction on downstream flow volumes. **The potential impact on the hydrological regime of the Geelsloot Stream was therefore assessed as Low to Very Low, confined to a local spatial scale, with no significant residual impacts anticipated following implementation of the recommended mitigation measures.**

To ensure the sustainable abstraction of groundwater and provide early detection of any unforeseen impacts, the following mitigation measures, as recommended by the geohydrological specialist, should be included as conditions of the Water Use Licence:

- Restrict groundwater abstraction to the recommended pumping rate of 2.2 L/s for 12 hours per day (approximately 95 m³/day) from the recommended pump intake depth of 35 m below ground level (mbgl).
- Implement a groundwater monitoring programme to monitor groundwater levels, groundwater quality and abstraction volumes.
    - Equip the borehole with a slotted conduit pipe (35 mm internal diameter Class 6 HDPE pipe) attached to the pump rising main and installed approximately 1 m above the pump inlet to facilitate groundwater level monitoring.

- Record groundwater levels and abstraction volumes at least monthly. Where feasible, automatic flow meters and water level loggers should be installed to record hourly measurements.
- Appoint a SACNASP-registered hydrogeologist to review the monitoring data annually and compile an annual groundwater monitoring report assessing groundwater trends, the sustainability of the abstraction, and any corrective actions that may be required.

Conclusion

Based on the findings of both the freshwater and geohydrological specialist assessments, the proposed abstraction of groundwater from the existing borehole is **not expected to result in significant adverse impacts on the Geelsloot Stream or any surrounding freshwater ecosystems**, provided that the recommended mitigation and monitoring measures are implemented. The proposed groundwater abstraction is therefore considered environmentally acceptable from a freshwater ecological perspective.

Following the assessment of the characteristics of the identified aquatic habitats, the DWS Risk Assessment Matrix (which is specified in the Government Notice R509 of 2016 for section 21 (c) and (i) water uses as defined under the NWA (1998)), was conducted to ascertain the significance of perceived impacts of the proposal on the key drivers and response processes (hydrology, water quality, geomorphology, habitat and biota) of the aquatic habitats. During both the construction and operational phases of the development, impacts on the freshwater features resulted in a **Low-risk score**.

From a freshwater ecological perspective, there are no ecological constraints that preclude the authorisation of the proposed groundwater abstraction, subject to the implementation of the recommended mitigation and groundwater monitoring measures.

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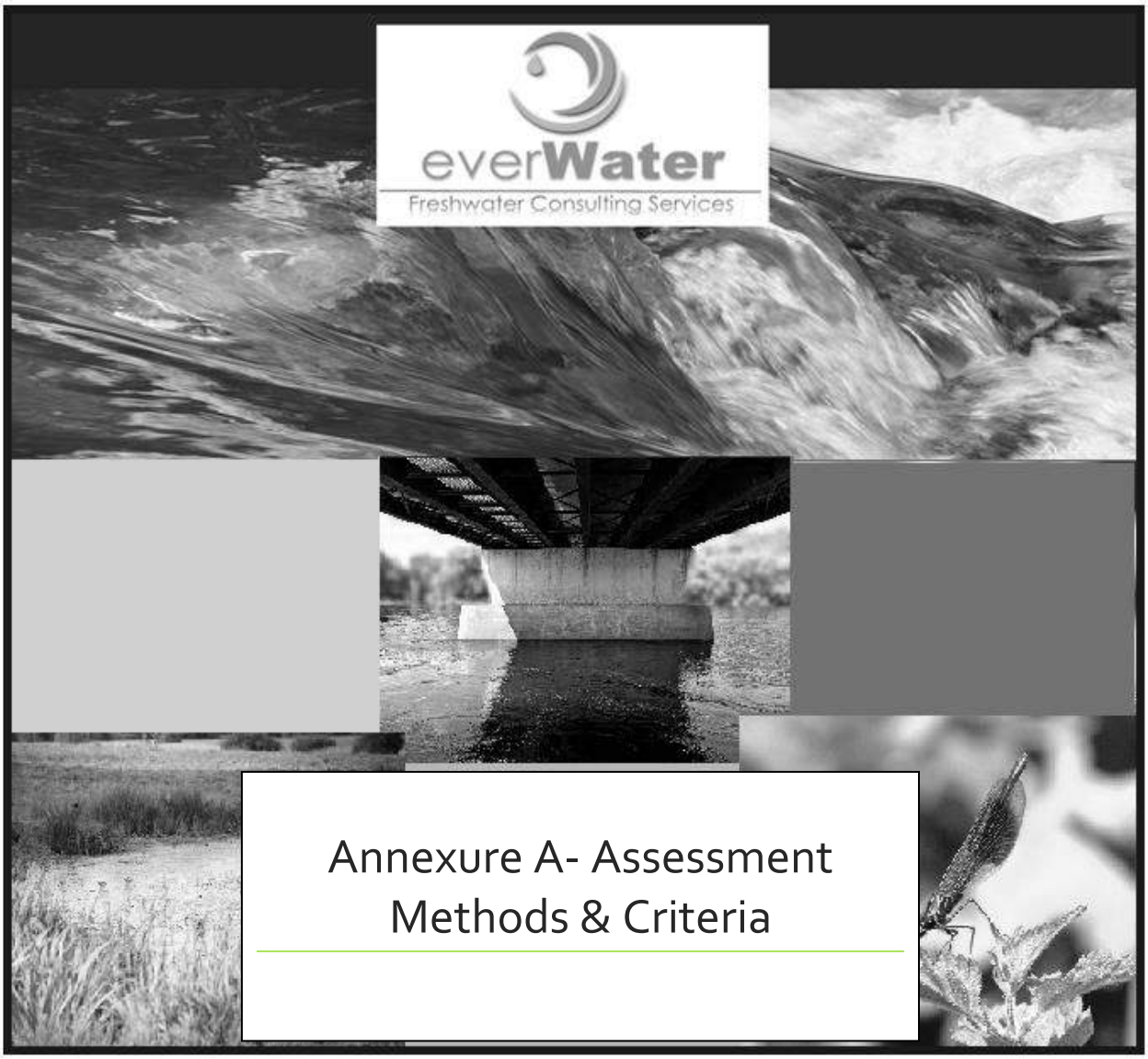
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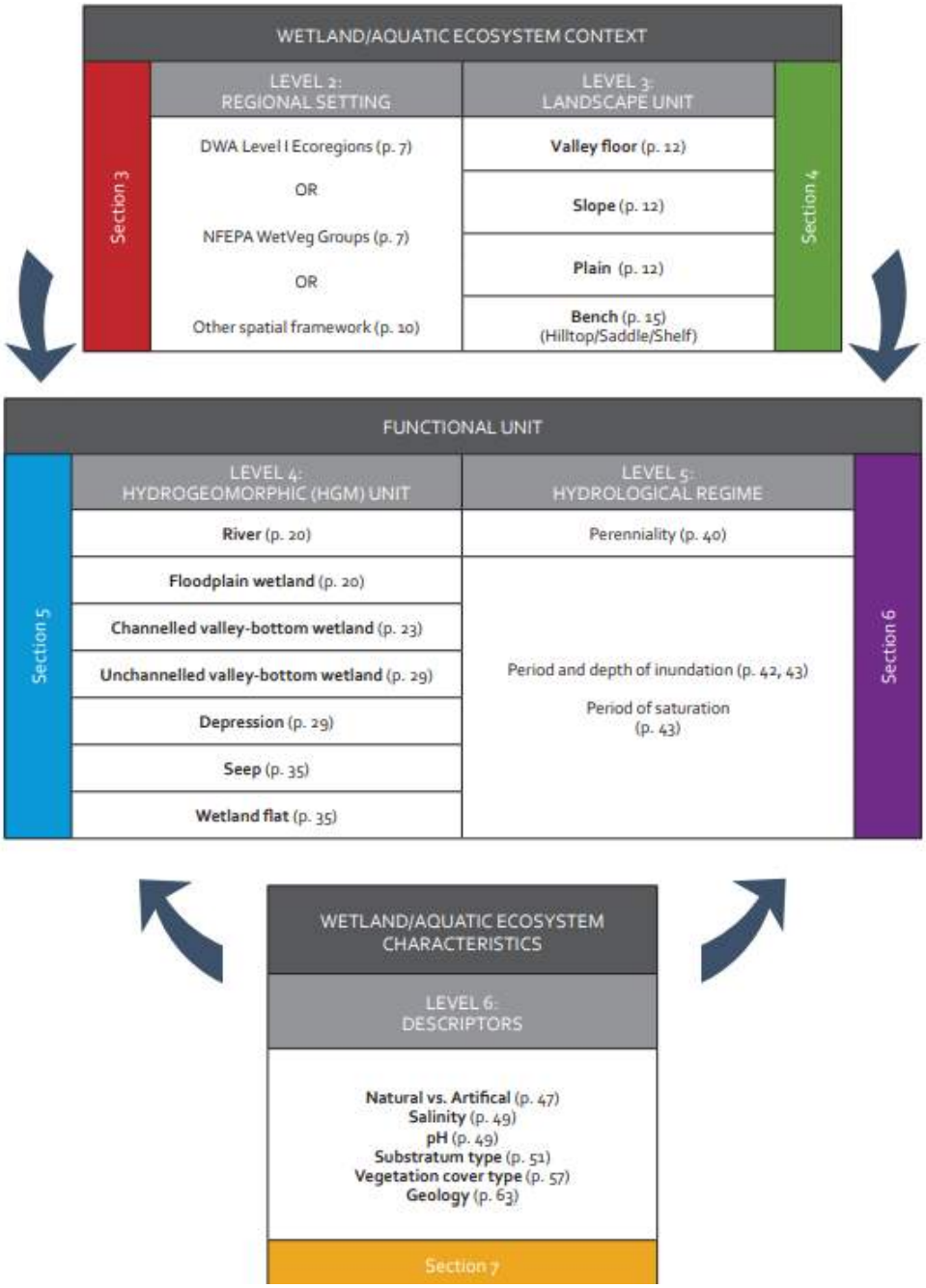


Annexure A- Assessment Methods & Criteria

Freshwater assessment methods:

Geomorphological and Physical Description of the Freshwater Features

The Classification System for Wetlands and Other Aquatic Ecosystems in South Africa (Ollis, 2013), was utilised to classify freshwater features encountered within the proposed study area. A summary of the classification system is presented below.



Classification of aquatic systems and Present ecological State calculation

A formal Habitat Integrity (PES), EIS (Ecostatus level III) and REC assessment were conducted to get a good representation of the present ecological state of the affected freshwater areas.

Ecological Assessment

Wetland Habitat Integrity:

The Wetland Habitat Integrity (WETLAND-IHI) model, as developed by the Department of Water Affairs and Forestry, was used as RAPID assessment of the wetland areas, for the purpose of reporting on the Present Ecological state (PES) of the wetland system in question. The Wetland Index of Habitat Integrity (WETLAND-IHI) is a tool developed for use in the National Aquatic Ecosystem Health Monitoring Programme (NAEHMP), formerly known as the River Health Programme (RHP) (Department of Water Affairs and Forestry Resource Quality Services, 2007). The output scores from the WETLAND-IHI model are presented in the standard DWAF A-F ecological categories (Table 1-1) and provide a score of the Present Ecological State of the habitat integrity of the wetland system being examined.

TABLE 1-1. IHI ECOLOGICAL CATEGORIES

Ecological Category	PES % Score	Description
A	90-100 %	**Unmodified, natural.**
B	80-89 %	**Largely natural with few modifications:** A small change in natural habitats may have taken place but the ecosystem functions are essentially unchanged.
C	60-79 %	**Moderately modified:** Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.
D	40-59%	**Largely modified.** A large loss and change of natural habitat, biota and basic ecosystem functions has occurred.
E	20-39%	**Seriously modified.** The loss of natural habitat, biota and basic ecosystem functions is extensive.
F	0-20 %	**Critically / Extremely modified:** Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances, the basic ecosystem functions have been destroyed and the changes are irreversible.

Ecological Importance and Sensitivity (EIS)

The ecological importance of a water resource is an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scales. Ecological sensitivity refers to the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred.

The Ecological Importance and Sensitivity (EIS) assessment considers a range of biotic and habitat determinants that indicate either ecological importance or sensitivity. These determinants are evaluated using a four-point scale, and the median of the scores is calculated to establish the overall EIS category.

TABLE 1-2 DEFINITION OF THE SCALE USED TO ASSESS BIOTIC AND HABITAT DETERMINANTS

Scale	Definition
1	One species/taxon judged as rare or endangered at a local scale.
2	More than one species/taxon judged to be rare or endangered on a local scale.
3	One or more species/taxon judged to be rare or endangered on a Provincial/regional scale.
4	One or more species/taxon judged as rare or endangered on National scale (SA Red Data Books)

TABLE 1-3. ECOLOGICAL IMPORTANCE AND SENSITIVITY CATEGORIES (DWAF, 1999)

EISC	General description	Range of median
Very high	Quaternaries/delineations considered to be unique on a national and international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3-4
High	Quaternaries/delineations considered to be unique on a national scale based on their biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) may be sensitive to flow modifications but in some cases may have substantial capacity for use.	>2-≤3
Moderate	Quaternaries/delineations considered to be unique on a provincial or local scale due to biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are not usually very sensitive to flow modifications and often have substantial capacity for use.	>1-≤2
Low/ marginal	Quaternaries/delineations not unique on any scale. These rivers (in terms of biota and habitat) are generally not very sensitive to flow modifications and usually have substantial capacity for use.	≤1

Recommended Management Objective (RMO), Recommended Ecological Category (REC), Freshwater Delineation and Buffer Zones

Recommended Management Objective

The RMO (table below) was determined based on the results obtained from the PES, reference conditions and EIS of the freshwater resource (sections above), with the objective of either maintaining, or improving the ecological integrity of the freshwater resource in order to ensure continued ecological functionality.

TABLE 1-4: RECOMMENDED MANAGEMENT OBJECTIVES (RMO) FOR WATER RESOURCES BASED ON PES & EIS SCORES.

PES			Ecological Importance and Sensitivity (EIS)			
			Very High	High	Moderate	Low
	A	Pristine	A Maintain	A Maintain	A Maintain	A Maintain
	B	Natural	A Improve	A/B Improve	B Maintain	B Maintain
	C	Good	A Improve	B/C Improve	C Maintain	C Maintain
	D	Fair	C Improve	C/D Improve	D Maintain	D Maintain
	E/F	Poor	D* Improve	E/F* Improve	E/F* Maintain	E/F* Maintain

***PES Categories E and F are considered ecologically unacceptable (Malan and Day, 2012) and therefore, should a freshwater resource fall into one of these PES categories, an REC class D is allocated by default, as the minimum acceptable PES category.**

Recommended Ecological Category

The four ecological importance and sensitivity categories can be regarded as equivalent to the four default ecological management classes (DEMC; A to D) proposed for the purposes of the National Water Act (Table A-4), i.e. it is suggested that a very high ecological importance and sensitivity should justify the assignment of a very high ecological management class, etc. Default ecological management classes are defined in terms of the sensitivity of a system to disturbance and the risk of damaging the system (i.e. its capacity for sustainability and self-recovery). Based on this, there would be a desire to manage the system within particular ranges of protection. The Recommended Ecological Class (REC) for the affected freshwater features were determined by considering the results of the IHI and EIS assessments.

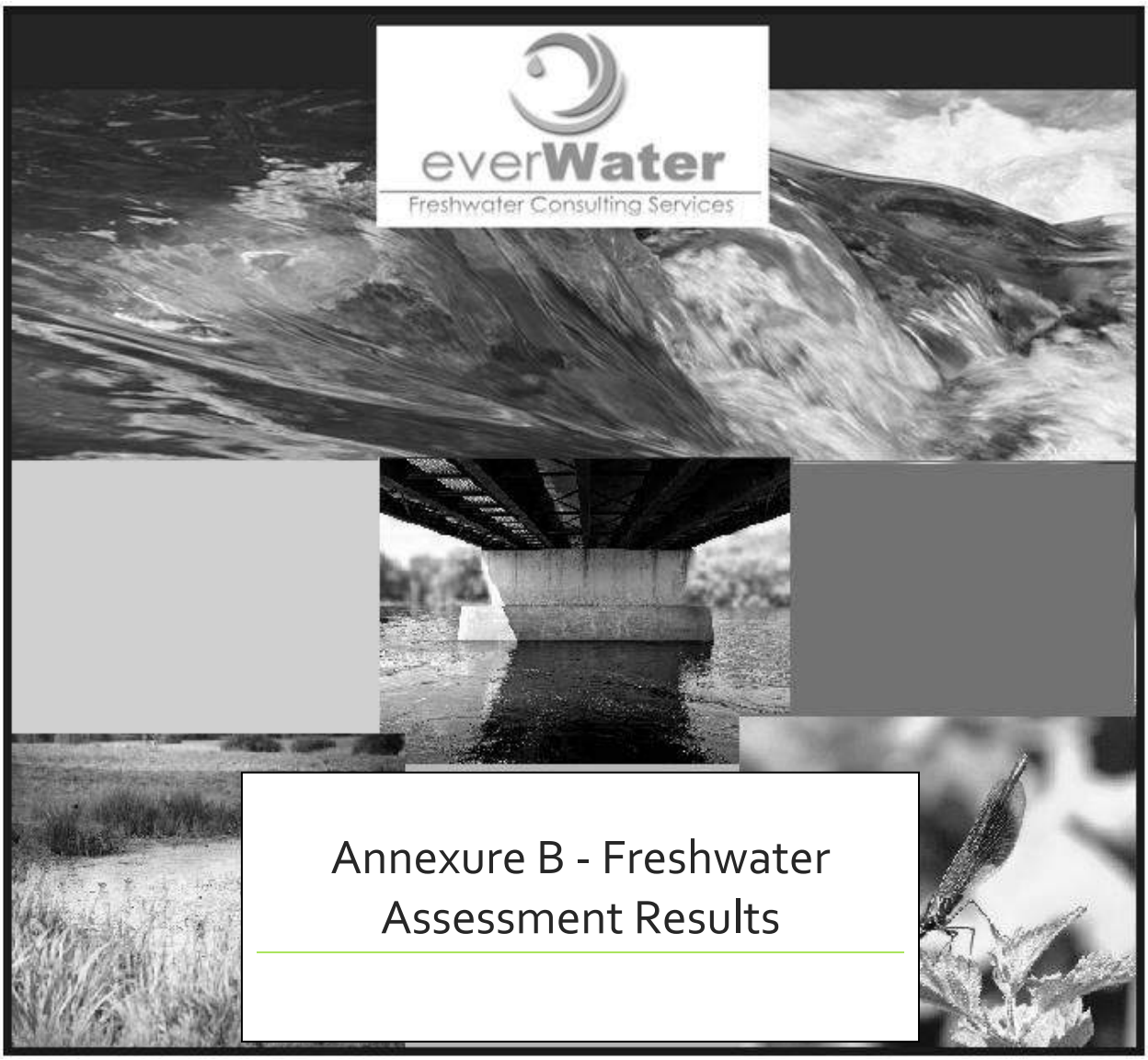
TABLE 1-5: DEFAULT ECOLOGICAL MANAGEMENT CLASSES FOR RIVERS (ADAPTED FROM KLEYNHANS 1996 AND KLEYNHANS ET AL. 1998).

Default Ecological Management Classes	Description Of Perceived Conditions And Allowable Risk

A Highly sensitive systems: No human-induced hazards	Highly sensitive systems. The natural abiotic template should not be modified. The characteristics of the resource should be determined by unmodified natural disturbance regimes. There should be no human-induced hazards to the abiotic and biotic maintenance of the resource.
B Sensitive systems: Small risk allowed	Sensitive systems. Only a small risk of modifying the natural abiotic template and exceeding the resource base should be allowed. Although the risk to the well-being and survival of especially intolerant biota (depending on the nature of the disturbance) at a very limited number of localities may be slightly higher than expected under natural conditions, the resilience and adaptability of biota must not be compromised. The impact of acute disturbances must be totally mitigated by the presence of sufficient refuge areas.
C Moderately sensitive systems: Moderate risk allowed	Moderately sensitive systems. A moderate risk of modifying the abiotic template and exceeding the resource base may be allowed. Risks to the well being and survival of intolerant biota (depending on the nature of the disturbance) may generally be increased with some reduction of resilience and adaptability at a small number of localities. However, the impact of local and acute disturbances must at least partly be mitigated by the presence of sufficient refuge areas.
D Resilient systems: Large risk allowed	Resilient systems. A large risk of modifying the abiotic template and exceeding the resource base may be allowed. Risks to the well-being and survival of intolerant biota (depending on the nature of the disturbance) may be allowed to generally increase substantially with resulting low abundances and frequency of occurrence, and a reduction of resilience and adaptability at a large number of localities. However, the associated increase in the abundance of tolerant species must not be allowed to assume pest proportions. The impact of local and acute disturbances must at least to some extent be

Freshwater Delineation and Buffer Zones

Freshwater features were delineated at a desktop level using historical digital satellite imagery (2003-2024) as well as topographical maps and were verified during a field visit according to the guidelines suggested by DWA (2008). Furthermore, the Buffer Zone Tool for the Determination of Aquatic Impact Buffers developed by the Department of Water and Sanitation (2014) was used to determine the extent of the buffer zone required for all freshwater features.



Annexure B - Freshwater Assessment Results

Habitat Integrity (PES)

Geelsloot Stream.

IHI Assessment and Results:

The Index of Habitat Integrity (IHI) assessment presented below was undertaken for the section of the Geelsloot Stream adjacent to the project site. The assessment scores reflect the current ecological condition of the stream reach as it flows past the property.

TABLE 2. INDEX OF HABITAT INTEGRITY ASSESSMENT RESULTS AND CRITERIA ASSESSED FOR THE RIPARIAN ZONE OF THE AFFECTED SECTION OF THE GEELSLOOT STREAM.

RIPARIAN ZONE HABITAT INTEGRITY	Geelsloot Stream
Vegetation Removal (Impact 1 - 25)	23
Exotic Vegetation (Impact 1 - 25)	14
Bank Erosion (Impact 1 - 25)	8
Channel Modification (Impact 1 - 25)	23
Water Abstraction (Impact 1 - 25)	0
Inundation (Impact 1 - 25)	0
Flow Modification (Impact 1 - 25)	16
Water Quality (Impact 1 - 25)	15
INTEGRITY CLASS	**F**

TABLE 3. INDEX OF HABITAT INTEGRITY ASSESSMENT RESULTS AND CRITERIA ASSESSED FOR INSTREAM ZONE OF THE AFFECTED SECTION OF THE GEELSLOOT STREAM.

INSTREAM HABITAT INTEGRITY	Geelsloot Stream
Water Abstraction (Impact 1 - 25)	0
Flow Modification (Impact 1 - 25)	20
Bed Modification (Impact 1 - 25)	23
Channel Modification (Impact 1 - 25)	23
Water Quality (Impact 1 - 25)	13
Inundation (Impact 1 - 25)	0
Exotic Macrophytes (Impact 1 - 25)	0
Exotic Fauna (Impact 1 - 25)	0
Rubbish Dumping (Impact 1 - 25)	18

INTEGRITY CLASS	E

Findings:

The IHI results are consistent with the field observations, indicating that both the instream and riparian habitat integrity of the Geelsloot Stream are already highly degraded. This reach was classified as **Seriously to Critically Modified (Category E/F)**, primarily as a result of extensive channelisation and bed modification, together with significant alterations to the natural flow regime following incorporation of the stream into the urban stormwater system. These historical modifications have substantially reduced the ecological integrity and natural functioning of the stream.

Ecological Importance and Sensitivity (EIS)

TABLE B-2. RESULTS OF THE EIS ASSESSMENT

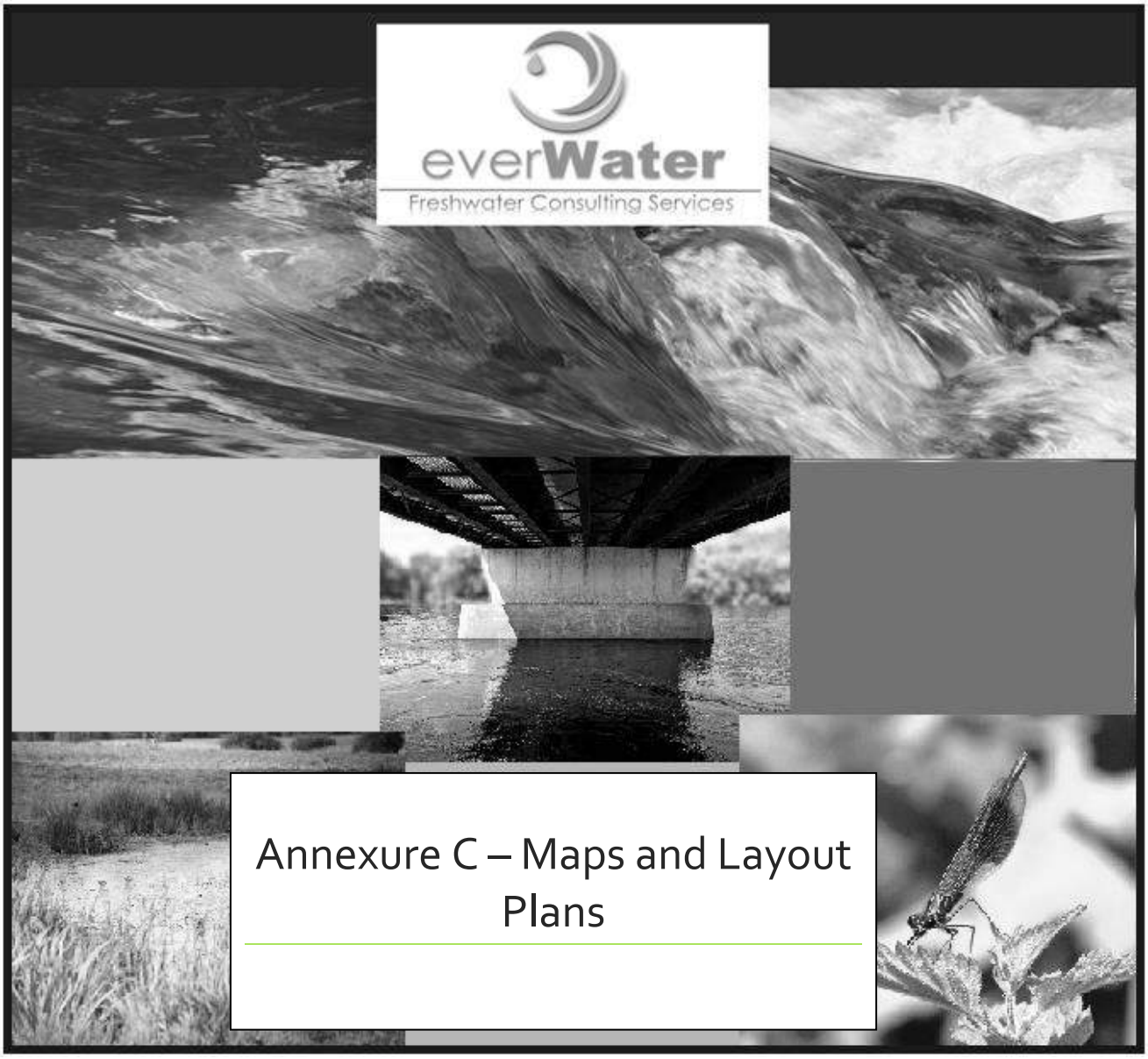
Biotic Determinants	Geelsloot Stream
Rare and endangered biota	0
Unique biota	0.5
Intolerant biota	0.5
Species/taxon richness	1
Aquatic Habitat Determinants	
Diversity of aquatic habitat types or features	0.5
Refuge value of habitat type	1
Sensitivity of habitat to flow changes	0.5
Sensitivity of flow-related water quality changes	0.5
Migration route/corridor for instream and riparian biota	0.5
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	0
Total	0.5
EIS CATEGORY	**Low to Very Low**

RMO, REC and Buffer zone.

TABLE B-3. RESULTS OF THE RMO, REC AND BUFFER ZONE ASSESSMENT

	RMO	REC	Buffer zone
Geelsloot Stream	E/F* Maintain ***PES Categories E and F are considered ecologically unacceptable (Malan and Day, 2012) and therefore, should a freshwater resource fall into one of these PES categories, an REC class**	D: Resilient systems. A large risk of modifying the abiotic template and exceeding the resource base may be allowed. Risks to the well-being and survival of intolerant biota (depending on the nature of the disturbance) may be allowed to generally increase substantially with resulting low abundances and	n/a

	D is allocated by default, as the minimum acceptable PES category	frequency of occurrence, and a reduction of resilience and adaptability at a large number of localities. However, the associated increase in the abundance of tolerant species must not be allowed to assume pest proportions. The impact of local and acute disturbances must at least to some extent be	


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Annexure C – Maps and Layout Plans

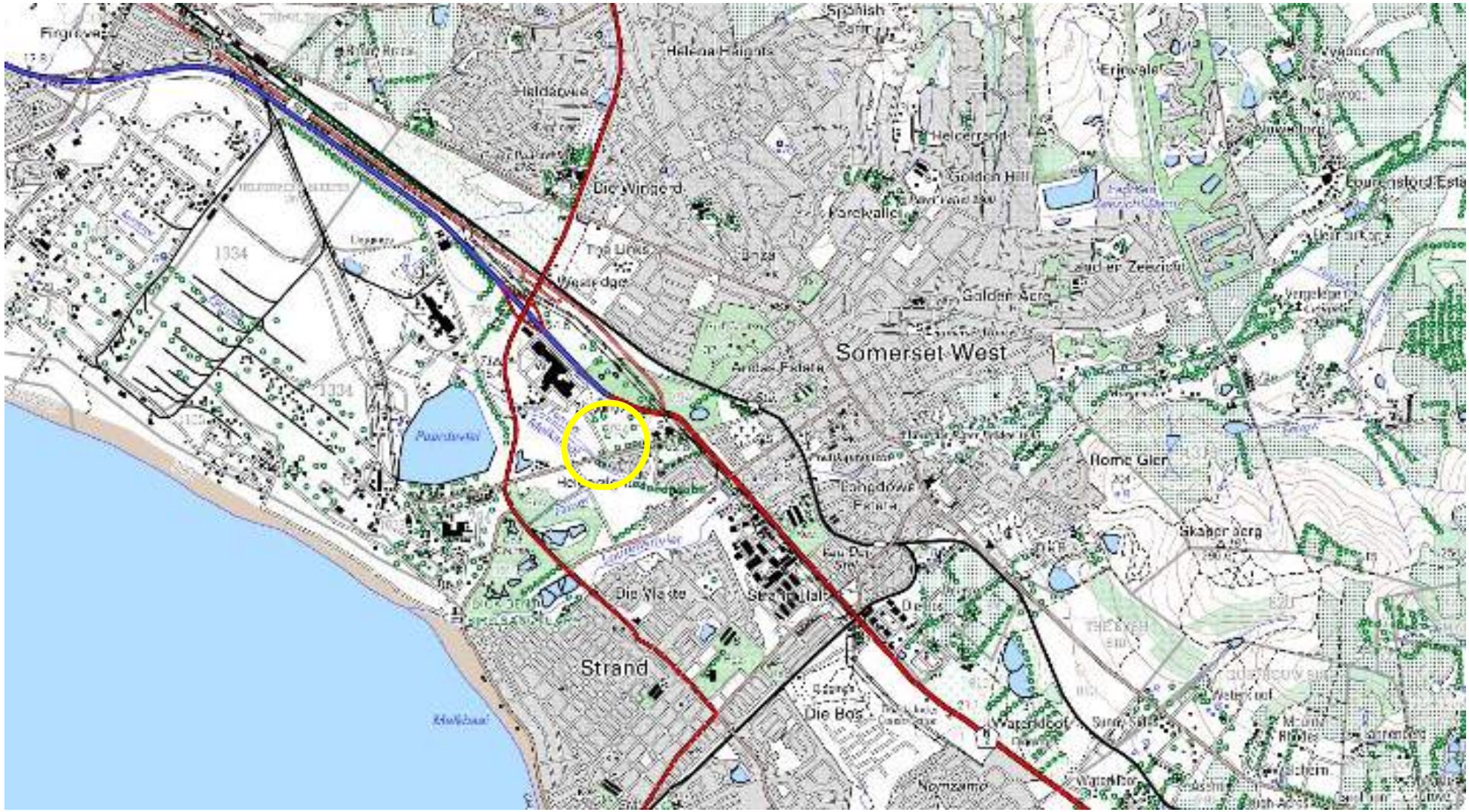
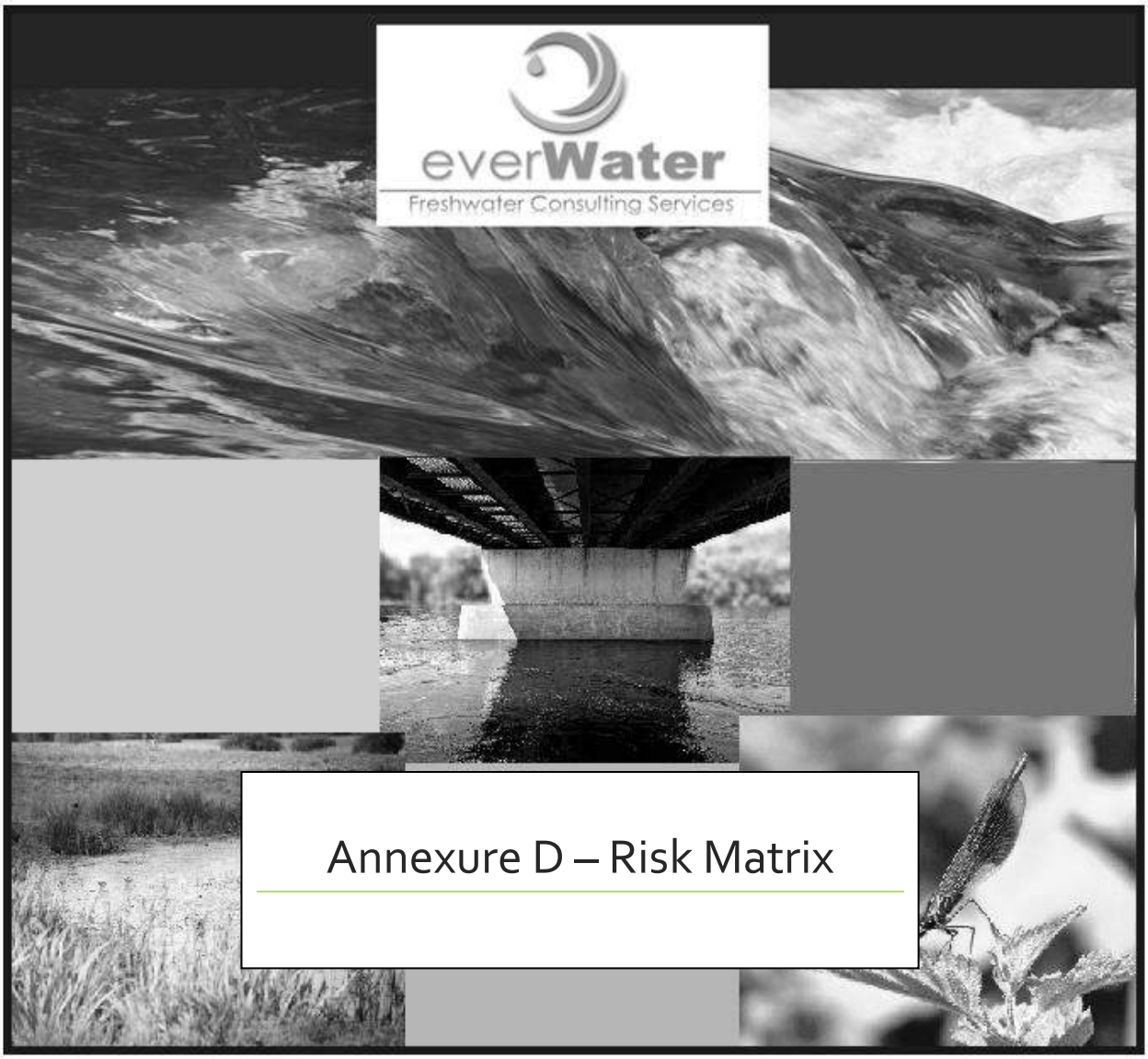


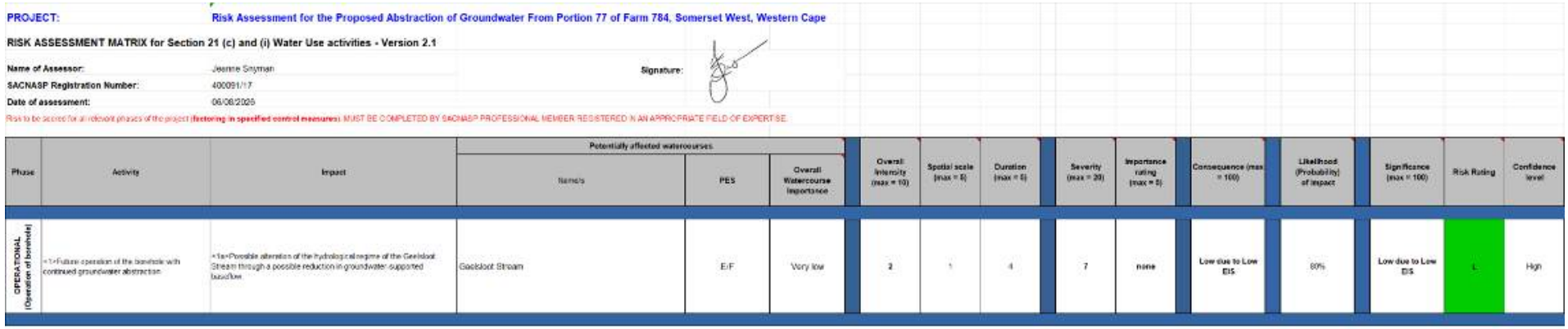
Figure C-1: 1:50 000 Topographical map of the area with the project location (3418BB)



Figure 15: Satellite imagery indicating the project site and abstraction point (yellow pin) in relation to the two mapped wetland areas (orange polygons), the Geelsloot Stream (Blue line), the stormwater channels (orange lines) and the actual extent of the current artificially wet area (green polygon).



Annexure D – Risk Matrix



PROJECT:	Risk Assessment for the Proposed Abstraction of Groundwater From Portion 77 of Farm 784, Somerset West, Western Cape	
RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities - Version 2.1		
Name of Assessor:	Jeanne Snyman	Signature:
SACNASP Registration Number:	400091/17	
Date of assessment:	06/08/2026	

Risk to be scored for all relevant phases of the project (factoring in specified control measures) MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE

Phase	Activity	Impact	Potentially affected watercourses: Name/s	PES	Overall Watercourse Importance	Overall Intensity (max = 10)	Spatial scale (max = 5)	Duration (max = 5)	Severity (max = 20)	Importance rating (max = 5)	Consequence (max = 100)	Likelihood (Probability) of impact	Significance (max = 100)	Risk Rating	Confidence level
OPERATIONAL (Operation of borehole)	1) Future operation of the borehole with continued groundwater abstraction	1a) Possible alteration of the hydrological regime of the Geelsloot Stream through a possible reduction in groundwater-supported baseflow	Geelsloot Stream	E/F	Very low	2	1	4	7	none	Low due to Low EIS	80%	Low due to Low EIS	L	High

Mitigation Measures:

- Restrict groundwater abstraction to the recommended pumping rate of 2.2 L/s for 12 hours per day (approximately 95 m³/day) from the recommended pump intake depth of 35 m below ground level (mbgl).
- Implement a groundwater monitoring programme to monitor groundwater levels, groundwater quality and abstraction volumes.
    - Equip the borehole with a slotted conduit pipe (35 mm internal diameter Class 6 HDPE pipe) attached to the pump rising main and installed approximately 1 m above the pump inlet to facilitate groundwater level monitoring.
    - Record groundwater levels and abstraction volumes at least monthly. Where feasible, automatic flow meters and water level loggers should be installed to record hourly measurements.
    - Appoint a SACNASP-registered hydrogeologist to review the monitoring data annually and compile an annual groundwater monitoring report assessing groundwater trends, the sustainability of the abstraction, and any corrective actions that may be required.



Annexure E – Details, Expertise And Curriculum Vitae Of Specialist

Abbreviated Curriculum Vitae

Personal Details

Surname : Snyman

Names : Jeanne Celeste

Date of Birth : 17 June 1983

Nationality : RSA

Profession : Freshwater Ecologist (SACNASP reg nr: 400091/17)

Key Qualifications

Academic Qualifications Institution (Date finished)	**Degree(s) or Diploma(s) obtained:**
North West University _ Potchefstroom campus. (2004)	BSc degree with Zoology and Microbiology
North West University _ Potchefstroom campus. (2006)	M.Env degree in Water Sciences (Cum laude),
North West University _ Potchefstroom campus. (2006)	Postgraduate Certificate In Education (PGCE)

Work Experience

Jeanne Snyman is Pr Sci Nat registered (400091/17) in the following fields of practice: Water Resource Science. Jeanne is an Aquatic, Wetland and Biodiversity Specialist with more than 13 years' experience in the environmental consulting field. She possesses a BSc. Masters in Freshwater Sciences and has worked on projects related to residential developments, infrastructural developments, sustainable energy and general natural resource management. Her work focusses mostly on doing Freshwater Impact Assessments, River Management and Maintenance plans, Rehabilitation plans and Audit Reports. Each project takes a total of approximately 24 (Supplementary Reports) to 50 hours (Freshwater assessments, RMMP's and Rehabilitation plans).

List of 2025/2026 projects:

- Snyman, J.C. February 2025. Freshwater Assessment For The New Water Use Of Biodegradable Effluent From The Remainder Of Farm 494, Clanwilliam, Western Cape
- Snyman, J.C. February 2025. Freshwater Baseline Report For The Proposed New Agricultural Development On The Remainder Of Farm 472, Vanrhynsdorp, Western Cape
- Snyman, J.C. March 2025. Freshwater Assessment For The Proposed New Development On Portion 14 Of Farm Slange Rivier 303, Swellendam, Western Cape
- Snyman, J.C. May 2025. Freshwater Assessment For The Alleged Unauthorised Activities That Took Place On Portion 1 Of Farm No. 320, Western Cape
- Snyman, J.C. June 2025. Freshwater Assessment For The Proposed Development Of A Free-Range Poultry Broiler Facility On The Farm Numbers 563, 564, 565 And Farm Kleinfontein Number 954, Worcester, Western Cape
- Snyman, J.C. July 2025. Freshwater Impact Assessment for the proposed New La Vallon development on Portions 5 and 6 of farm 1426 , Paarl, Western Cape
- Snyman, J.C. October 2025. Freshwater Assessment For Alleged Unlawful Activities That Took Place On Portion 16 Of Farm Derde Heuvel 149, Montagu Rd, Western Cape
- Snyman, J.C. October 2025. Rehabilitation Plan And Mmp For The Alleged Unlawful Activities That Took Place On Portion 16 Of Farm Derde Heuvel 149, Montagu Rd, Western Cape
- Snyman, J.C. September 2025. Second Addendum To The Freshwater Assessment For The Proposed Development On The Rhebokskloof Estate, Paarl
- Snyman, J.C. September 2025. Freshwater Assessment For The Proposed New Jebo Connect Fibre Cable, Bredasdorp, Western Cape
- Snyman, J.C. November 2026. Freshwater Assessment For The Proposed New Development On Erf2278, Camps Bay, Western Cape
- Snyman, J.C. February 2026. Freshwater Risk Assessment For The Proposed New Baboon Enclosure On The Remainder Of Farm 1049, Western Cape
- Snyman, J.C. February 2026. River Maintenance And Management Plan For The Proposed New Casa Maris Residential Development, Somerset West, Western Cape
- Snyman, J.C. March 2026. Site Sensititivy Verification Report For The Unauthorised Establishment Of Free-Range Chicken Houses On Portion 34 Of Farm 811, Tesselaarsdal, Caledon, Western Cape.
- Snyman, J.C. March 2026. Freshwater Assessment For The Proposed And Existing Activities On Portions 45 And 38 Of Farm 115, Robertson, Western Cape
- Snyman, J.C. May 2026. Freshwater Risk Assessment For The Proposed Baboon-Proof Northern Fence, Cape Town, Western Cape
- Snyman, J.C. May 2026. Freshwater Impact Assessment And Risk Matrix For The Proposed Abland (Pty) Ltd Development, Somerset West, Western Cape
- Snyman, J.C. May 2026. Audit Report For Authorised Water Use Activities On Portion 2 And 9 Of Farm January's Kraal 580, Malmesbury Rd, Western Cape