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

JUNE 2025

(Updated October 2025)

Compiled by: Ms. Jeanne Snyman (M.Sc. Env Water Sciences, Pr. Sci. Nat)

EXECUTIVE SUMMARY

The client, Elgin Free Range Chickens (EFRC Agri Operations (Pty) Ltd.), proposes the development of a Free-Range Poultry Broiler Facility on the Remainder of Farm numbers 563, 564, 565, and Farm Kleinfontein number 954, Worcester, Western Cape (hereafter referred to as the project site). This freshwater report was commissioned for input into both the Environmental process and the Water Use Licence Application (WULA). The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed development area, as well as assess the impacts of the proposed activities on all freshwater features affected.

The study site is located just off Koppies Road, which extends from the R43, approximately 12 km northeast of Villiersdorp. The project area falls within the larger Hoeks River Catchment, specifically within Quaternary Catchment H40F, which forms part of the Breede-Gouritz Water Management Area (WMA). The landscape is generally characterised by undulating hills and valleys, predominantly used for agricultural purposes, and includes several small tributaries of the Ratel River. Other larger landscape features surrounding the property include the Stettyns mountains located to the far west.

The site contains four primarily seasonal streams (Streams A to D), which originate in the southeastern hills and flow north-northwest, eventually converging into two tributaries before joining the Ratel River. While their upper reaches remain natural, the streams become modified to varying degrees in farmed areas due to vegetation clearance, agricultural encroachment, instream dams, and canalisation, especially in Streams A and B. Both tributaries terminate in large farm dams near the Ratel River.

Due to their similar condition and geomorphological characteristics, as well as the fact that they form two distinct tributaries, Streams A and B were assessed as a single unit, as were Streams C and D. The freshwater assessment result can be summarised as follows:

	Stream A and B	Streams D and E
DWA catchment	H40F	
Vegetation type	Breede Shale Renosterveld (Critically Endangered)	
Rainfall region	Winter	
System	Inland System	
Regional Setting	Western Folded Mountains	
Landscape unit	Slope to Valley Floor	
Hydrogeomorphic Unit	Stream (Seasonal)	
Longitudinal zonation/Landform/ Outflow drainage	Foothill - Sand Bed	
Landform/Inflow drainage	Active Channel	
Substratum type	Loam and Clay	
Special conservational features (from desktop study)	**WCSBP (2017)**	Based on the 2023 WCBSP map (Figure 6), terrestrial Critical Biodiversity Areas (CBA's) were found around the remaining natural areas on the property

		Furthermore, aquatic Ecological Support Areas (ESA1: Ground Water Source) were also indicated specifically towards the south and east of the property.
	NFEPA	According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5) (refer to Figure 10), the broader catchment in which the project site is located is classified as a FishFEPA (Fish support area). In addition to the above, the National Wetlands Map classifies the Ratel River and its larger associated floodplain as East Coast Shale Renosterveld_Floodplain wetland, currently in a C condition (FEPA rank 5).
PES	D/E: Largely to Seriously modified	A/B: Natural to Largely Natural
EIS	Low to Moderate	High
RMO and REC	RMO – D: Maintain; REC – D	RMO – A: Maintain; REC – A/B
Proposed Buffer Zone	**Road Crossings:** As the proposed work will occur within the stream channels, the implementation of a buffer zone is not considered feasible. **Other Activities:** All other activities should be located outside a 30-meter buffer zone measured from the edge of the streams' riparian areas.	

Of the proposed project components, only the new stream crossings will directly impact the freshwater features on site. Additionally, the nature of the development (a chicken broiler facility), together with some management activities, could potentially pose a risk of indirect impacts on water quality and hydrology.

These activities might have an impact on the following:

- Loss of biodiversity, aquatic habitat and ecological structure;
- Potential hydrology modification and change in sediment balance;
- Potential Water Quality impacts.

In order to mitigate the above, several mitigation measures have been included and would be applicable to all affected freshwater features/stream crossings along the road.

CONCLUSION

With the implementation of appropriate mitigation measures, the proposed activities with their expected operational phase, are expected to result in a general short-term **low negative impact** on the site's freshwater features.

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**.

As all the indicated freshwater features found within the project site would be defined as a watercourse, any activities that are to take place within 32 meters thereof could require authorisation in terms of the relevant regulations of NEMA. In addition, Section 21 of the National Water Act and Regulation 1199 of 2009, as it relates to the NWA, will also apply, and therefore, a Water Use License will usually be required for the proposed development unless a General Authorisation is granted.

DOCUMENT GUIDE

The table below provides the specialist report requirements for the assessment and reporting of impacts on aquatic biodiversity in terms of Government Notice 320 as promulgated in Government Gazette 43110 of 20 March 2020 in line with the Department of Environmental Affairs screening tool requirements, as it relates to the National Environmental Management Act, 1998 (Act No. 107 of 1998).

No.	Requirements	Section in report/Notes
2.1	Assessment must be undertaken by a suitably qualified SACNASP registered specialist	Declaration Of Independence – pg iii and Annexure E.
2.3.1	Description of the preferred development site, including the following aspects-	
	a. Aquatic ecosystem type b. Presence of aquatic species and composition of aquatic species communities, their habitat, distribution and movement patterns	Flora and Fauna: pg. 8 Aquatic Assessment: pg. 12-13 & Annexure B
2.3.2	Threat status, according to the national web-based environmental screening tool of the species and ecosystems, including listed ecosystems as well as locally important habitat types identified	Conservation value: pg.10-11
2.3.3	National and Provincial priority status of the aquatic ecosystem (i.e. is this a wetland or river Freshwater Ecosystem Priority Area (FEPA), a FEPA sub-catchment, a Strategic Water Source Area (SWSA), a priority estuary, whether or not they are free-flowing rivers, wetland clusters, etc., a CBA or an ESA; including for all a description of the criteria for their given status	Conservation value: pg.10-11
2.3.4	A description of the Ecological Importance and Sensitivity of the aquatic ecosystem including: a. The description (spatially, if possible) of the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the site (e.g. movement of surface and subsurface water, recharge, discharge, sediment transport, etc.); b. The historic ecological condition (reference) as well as Present Ecological State (PES) of rivers (in-stream, riparian and floodplain habitat), wetlands and/or estuaries in terms of possible changes to the channel, flow regime (surface and groundwater)	Conservation value: pg.10-11; Aquatic Assessment: pg. 12-13 & Annexure B
2.4	Identify any alternative development footprints within the preferred development site which would be of a "low" sensitivity as identified by the national web-based environmental screening tool and verified through the Initial Site Sensitivity Verification	Activities have already been moved to fall within areas with low sensitivity.
2.5	Assessment of impacts – a detailed assessment of the potential impact(s) of the proposed development on the following very high sensitivity areas/ features:	Impact Assessment: pg. 14-18

2.5.1	Is the development consistent with maintaining the priority aquatic ecosystem in its current state and according to the stated goal?	Yes, if all mitigation measures are implemented all the RMO's (pg. 37) and the RQO's as stated in Table 1 (pg. 3) will be met.
2.5.2	Is the development consistent with maintaining the Resource Quality Objectives for the aquatic ecosystems present?	
2.5.3	How will the development impact on fixed and dynamic ecological processes that operate within or across the site, including: a. Impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regime (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes); b. Change in the sediment regime (e.g. sand movement, meandering river mouth/estuary, changing flooding or sedimentation patterns) of the aquatic ecosystem and its sub-catchment; c. The extent of the modification in relation to the overall aquatic ecosystem (i.e. at the source, upstream or downstream portion, in the temporary / seasonal / permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.) and d. Assessment of the risks associated with water use/s and related activities.	Impact Assessment: pg. 14-18
2.5.4	How will the development impact on the functionality of the aquatic feature including: a. Base flows (e.g. too little/too much water in terms of characteristics and requirements of system); b. Quantity of water including change in the hydrological regime or hydroperiod of the aquatic ecosystem (e.g. seasonal to temporary or permanent; impact of over abstraction or instream or off-stream impoundment of a wetland or river); c. Change in the hydrogeomorphic typing of the aquatic ecosystem (e.g. change from an unchanneled valley-bottom wetland to a channelled valley-bottom wetland); d. Quality of water (e.g. due to increased sediment load, contamination by chemical and/or organic effluent, and/or eutrophication); e. Fragmentation (e.g. road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal); and f. Loss or degradation of all or part of any unique or important features associated with or within the aquatic ecosystem (e.g. waterfalls, springs, oxbow lakes, meandering or braided channels, peat soil, etc).	Impact Assessment: pg. 14-18
2.5.5	How will the development impact on key ecosystem regulating and supporting services especially Flood attenuation; Streamflow regulation; Sediment trapping; Phosphate assimilation; Nitrate assimilation; Toxicant assimilation; Erosion control; and Carbon storage.	Impact Assessment: pg. 14-18
2.5.6	How will the development impact community composition (numbers and density of species) and integrity (condition, viability, predator-prey ratios, dispersal rates, etc.) of the faunal and vegetation communities inhabiting the site?	Impact Assessment: pg. 14-18

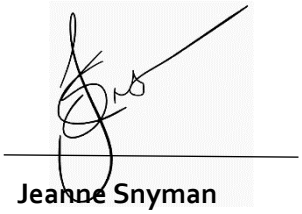
2.6	In addition to the above, where applicable, impacts to the frequency of estuary mouth closure should be considered, in relation to: size of the estuary; availability of sediment; wave action in the mouth; protection of the mouth; beach slope; volume of mean annual runoff; and extent of saline intrusion (especially relevant to permanently open systems).	N/A
2.7	The report must contain as a minimum the following information:	
2.7.1	Contact detail of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae.	Annexure E
2.7.2	A signed statement of independence by the specialist.	Declaration Of Independence – pg.xii
2.7.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment.	Aquatic Assessment: pg. 12-13 & Annexure B
2.7.4	The methodology used to undertake the site inspection and the specialist assessment, including equipment and modelling used, where relevant.	Annexure A
2.7.5	A description of the assumptions made, any uncertainties or gaps in knowledge or data.	Pg. 1
2.7.6	The location of areas not suitable for development, which are to be avoided during construction and operation, where relevant.	Impact Assessment: pg. 14-18
2.7.7	Additional environmental impacts are expected from the proposed development.	Impact Assessment: pg. 14-18
2.7.8	Any direct, indirect and cumulative impacts of the proposed development on site.	Summary of the expected impacts: pg. 19
2.7.9	The degree to which impacts and risks can be mitigated.	Summary of the expected impacts: pg. 19
2.7.10	The degree to which impacts and risks can be reversed.	Summary of the expected impacts: pg. 19
2.7.11	The degree to which the impacts and risks can cause loss of irreplaceable resources.	Summary of the expected impacts: pg. 19
2.7.12	A suitable construction and operational buffer for the aquatic ecosystem, using the accepted methodologies.	Aquatic Assessment: pg. 12-13 & Annexure B
2.7.13	Proposed impact management actions and impact management outcomes for inclusion in the Environmental Management Programme (EMPr).	Impact Assessment: pg. 14-18
2.7.14	A motivation must be provided if there were development footprints identified as per paragraph 2.3 for reporting in terms of Section 24(5)(a) and (h) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) that were identified as having a "low" aquatic biodiversity and sensitivity and that were not considered appropriate.	Described and motivated under Aquatic Assessment: pg. 12-13 & Annexure B, and Impact Assessment: pg. 14-18
2.7.15	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not.	Conclusion – pg.22
2.7.16	Any conditions to which this statement is subjected.	Included in mitigation measures set out under the Impact Assessment: pg. 14-18, and Risk Matrix – Annexure D.

Table of Contents

DECLARATION OF INDEPENDENCE

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

- I am subcontracted as specialist consultant by PHS Consulting, for input on the freshwater impacts related to activities associated with the proposed development of a free-range poultry broiler facility on the Remainder of Farm numbers 563, 564, 565 and Farm Kleinfontein number 954, Worcester, 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

SACNASP Reg. No: 400091/17

COPYRIGHT

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, Elgin Free Range Chickens (EFRC Agri Operations (Pty) Ltd.), proposes the development of a Free-Range Poultry Broiler Facility on the Remainder of Farm numbers 563, 564, 565, and Farm Kleinfontein number 954, Worcester, Western Cape (hereafter referred to as the project site). This freshwater report was commissioned for input into both the Environmental process and the Water Use Licence Application (WULA). The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed development area, as well as assess the impacts of the proposed activities on all freshwater features affected.

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, as well as determine the impact of the proposed activities on such freshwater features.

- 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 13 November 2024, 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.

- 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 and ecological importance, and sensitivity of the river 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 physical-chemical 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 Breede-Gouritz Catchment

In addition to the above legislation, the Department of Water and Sanitation has released the proposed classes of water resources and Resource Quality Objectives (RQOs) for the Breede-Gouritz Water Management Area, as published in Government Notice 1298 of Gazette 42053 on 23 November 2018, in terms of Section 13(4) of the National Water Act (1998).

For the H40E Catchment, which falls within the A3 Middle Breede Renosterveld zone, only general RQOs are applicable. These, along with RQOs specific to rivers within this quaternary catchment, have been set out for the section of the Breede River that runs through this area (and is not specifically applicable to the tributaries located on the property or the Ratel and Hoeks Rivers running through the catchment area).

.

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	Natural MAR (million m^3/a)
A3 Middle Breede Renosterveld	III	H40D		Doring River	Niv13	E	47.50
		H40F	A3-R04	Breede River	Nvii8	C/D	1042.80
		H40F		Breede River	Ni1	A/B	1043.40
		H40G		Poesjenels River	Nvii11	D	16.10
		H40H		Vink River	Niv15	D/E	15.60
		H40J		Willem Nels River	Nviii2	D/E	5.20
		H40J		Breede River	Nvii19	A/B	1081.90
		H40K		Keisers River	Nvii12	D	7.10
		H40K		Keisers River	Niv14	D	12.60
		H40L		Breede River	Nvi1	D	1099.90
		H30E		Kogmanskloof River	Nii2	D	52.00
		H50A		Breede River	Niii3	D	1153.40
		H50B	A3-R05	Breede River	Ni2	D	1170.10

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 study site is located just off Koppies Road, which extends from the R43, approximately 12 km northeast of Villiersdorp. The project area falls within the larger Hoeks River Catchment, specifically within Quaternary Catchment H40F, which forms part of the Breede-Gouritz Water Management Area (WMA). The landscape is generally characterised by undulating hills and valleys, predominantly used for agricultural purposes, and includes several small tributaries of the Ratel River. Other larger landscape features surrounding the property include the Stettyns mountains located to the far west.

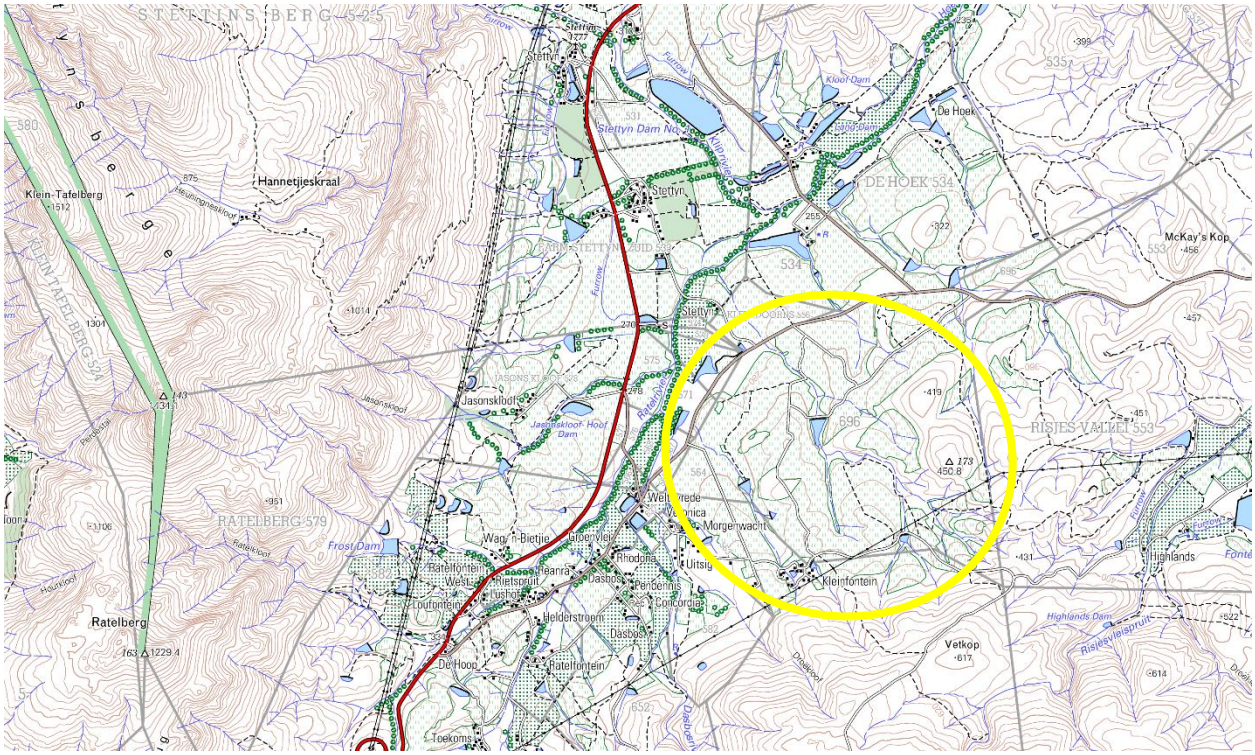


Figure 1: 1:50 000 Topographical map of the area with the project location (3319CD)

Proposed Activity

The client proposes the development of a Free-Range Poultry Broiler Facility. The Broiler Facility will involve the establishment of 20 Broiler Houses (approx. 1044m² per facility [87m x 12m]). Each facility will house approximately 17,000 birds. An Ablution facility, Guard House, Spray Race and Refrigerated Container will be located at the entrance to the site. Furthermore, an additional Ablution Facility and Residential Dwelling will be located at the broiler facilities. Numerous internal roads will be upgraded and realigned where applicable for biosecurity reasons, to improve traffic flow and safety, and to improve river crossings.

In addition to the above, the following services will also be included in the project:

Water:

A Water Treatment Plant is proposed to treat the water from the existing Boreholes (BH1 & BH2), which will be fed via a pipeline from the boreholes to the Water Treatment Plant. Thereafter, treated water will be sent to two proposed reservoirs (300kl each) on site. Water will be sent from the main reservoir directly to the broiler houses. Water storage tanks will be located at each chicken house (1 x 5000 L and 1 x 1000 L). All water pipelines will run, as far as possible, on the side of existing and the new roads. The HT power distribution lines will be located within the same trench.

Waste:

- Domestic Sewerage - underground collection/treatment tanks will be located at all ablution and domestic houses.
- Chicken Manure will be collected by surrounding farmers for fertilisation. Cold storage will be utilised as temporary storage for mortalities, which will then be disposed of at a bio-approved landfill site.

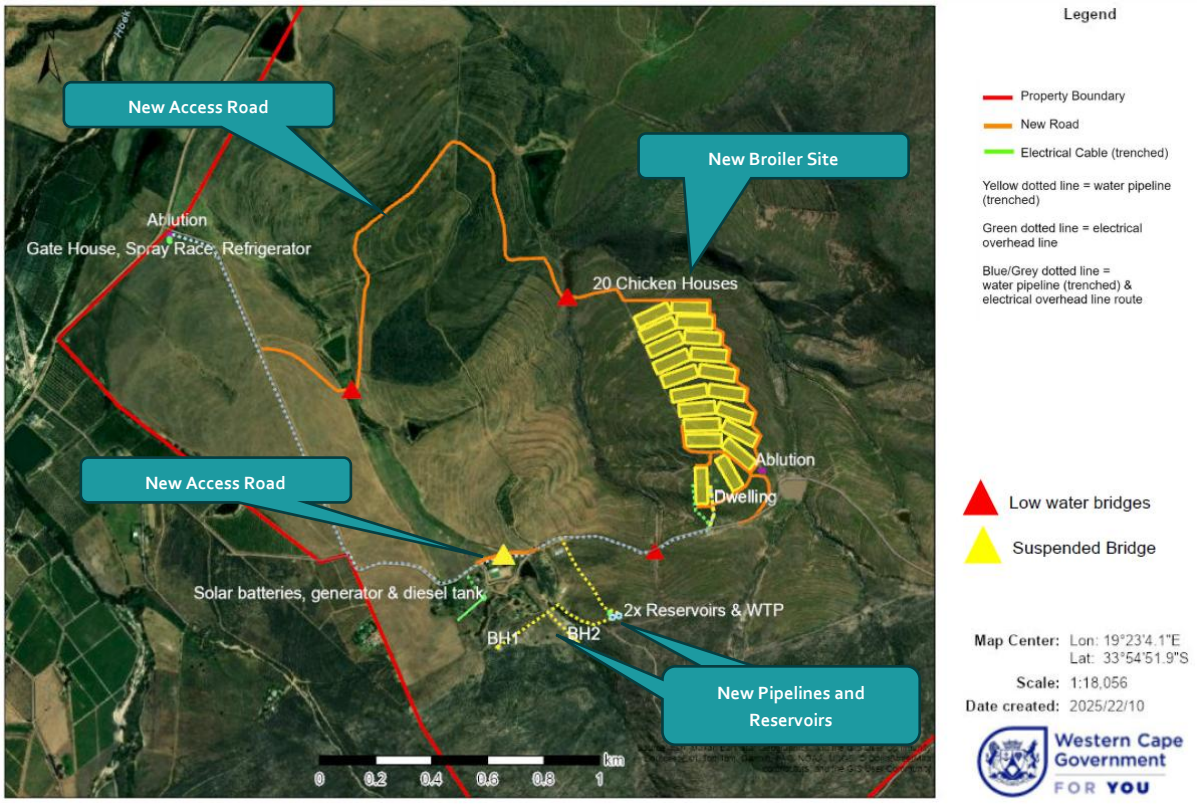


Figure 2: Proposed activities in relation to the affected freshwater features (Google Earth, 2025).

Historical and current land use

The project site is generally surrounded by a mix of agricultural land, natural areas, and a few small watercourses. According to the National Land Cover Map (Figure 3), the new development will largely fall over areas classified as Cultivated – commercial annual crops rain-fed / dryland (Temporary crops) (dark brown), Cultivated - fallow land & old fields (grass) (Pink) and Shrubland – Low Shrubland Fynbos (light green).

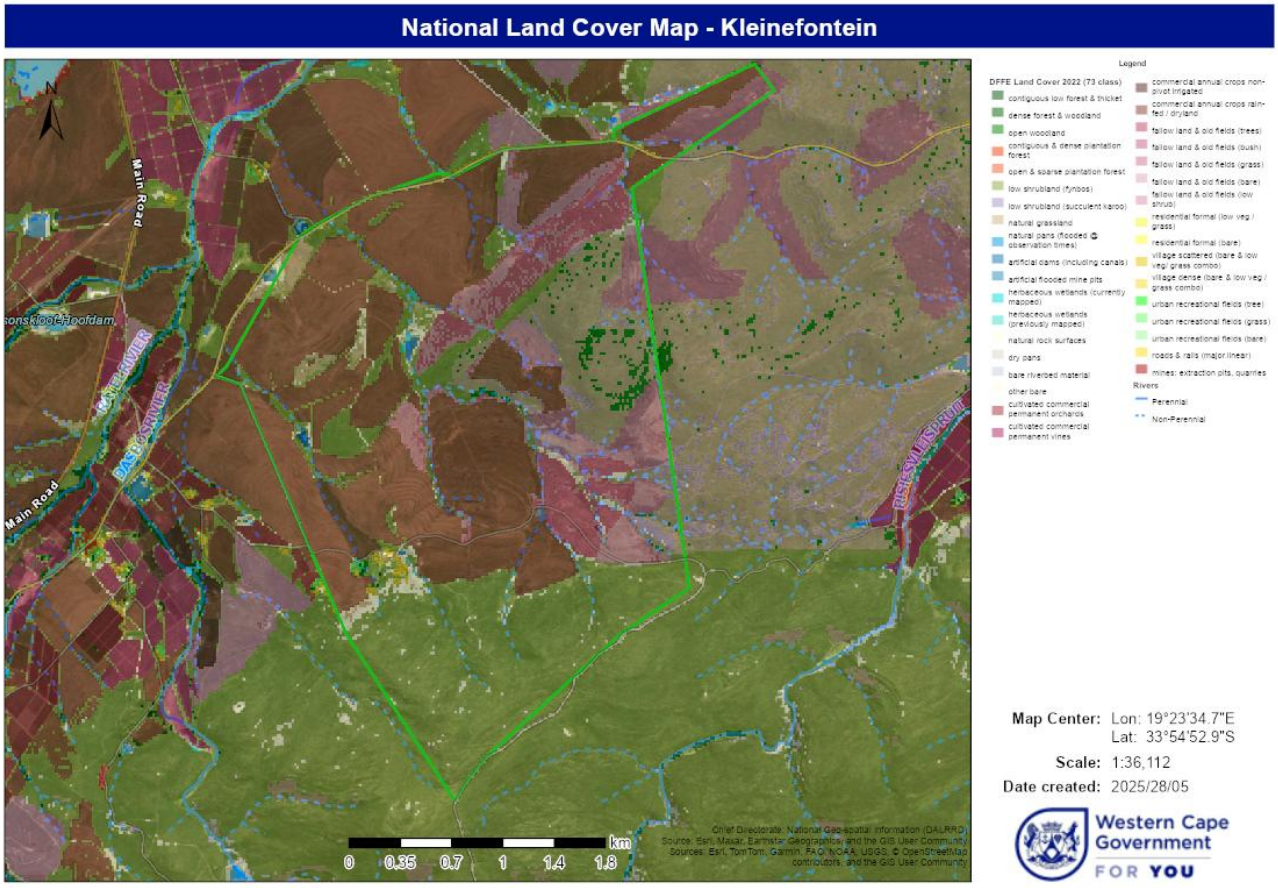


Figure 3: National land cover map (2014) covering the proposed development area (CFM, 2025)

Climatic conditions of the site

Villiersdorp's climate was used as a benchmark for the site and can be classified as a Mediterranean climate, which is generally characterised by warm, dry summers and cool, wet winters. The surrounding mountains and Theewaterskloof Dam influence the local microclimate, with slightly cooler and wetter conditions compared to more inland or low-lying parts of the Breede Valley. The project area receives about 519mm of rain annually (CFM, 2025). The chart below shows the average rainfall values for Villiersdorp per month. In the last year, it received the lowest rainfall (9,9mm) in February and the highest (155.5mm) in June. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Villiersdorp range from 16°C in July to 30°C in February. The region is the coldest during July, when the mercury drops to 6°C on average during the night.

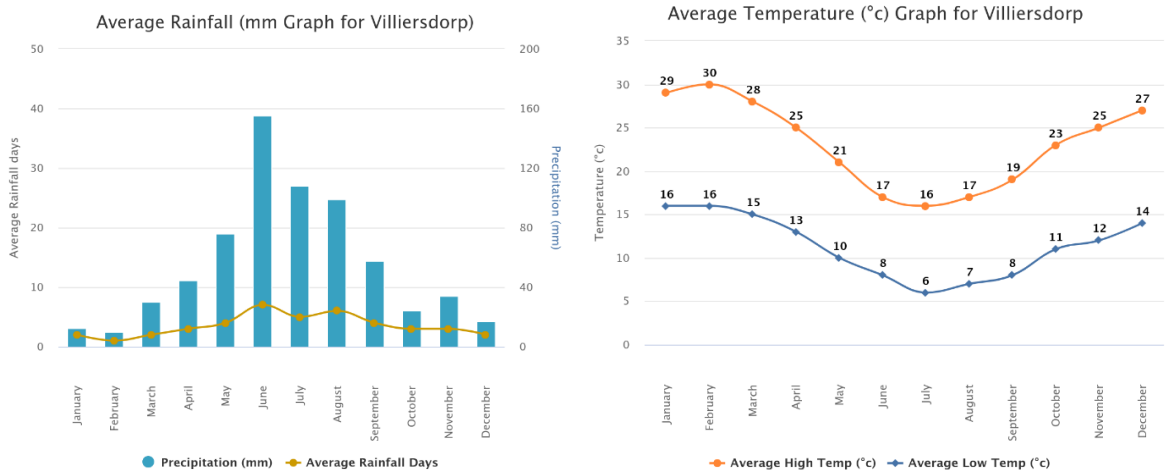


Figure 4: Climate graphs for the Villiersdorp area (World Weather Online, 2025)

Flora and Fauna

Flora

Vegetation associated with the project site is largely classified as the Endangered Breede Shale Renosterveld (FRs8), represented by the blue area in Figure 5. Smaller patches of North Sonderend Sandstone Fynbos (purple area) and Robertson Karoo (yellow area) are also present.

Breede Shale Renosterveld typically occurs in patches throughout the Breede River Valley, from Tulbagh to Swellendam. More specifically, it is found on most of the valley floor between Tulbagh and Wolseley, in isolated small patches near Worcester, in diverse patches between Stettyn and McGregor (south of the Breede River), and as a near-continuous but irregular band on the southern foothills of the Langeberg Mountains from Philipsdale (near Worcester) to Ashton. The most extensive areas occur near Ashton, McGregor, and at the confluence of the Riviersonderend and Breede Rivers west of Swellendam.

The vegetation and landscape features generally associated with this type include low hills, slightly undulating to undulating plains, and lower mountain slopes. In the eastern regions, open, tall shrublands—possibly closely affiliated with FRs12 Central Rûens Shale Renosterveld—are found, where microphyllous shrubs form the dominant layer. Breede Shale Renosterveld transitions into Robertson Karoo in the central valley. Karoo shrublands typically occur on the northern aspects, while renosterveld is found on the southern aspects, with a decline in karoo shrubland extent to the south. Heuweltjies (mound-like features) are prominent, often supporting bush clumps in moister areas and succulent shrubs in drier habitats (Mucina & Rutherford, 2006).

Vegetation found within the affected freshwater features ranged from being in a largely natural state to being largely to seriously modified condition at places. Terrestrial riparian vegetation generally found within the healthier riparian areas included

Sandolien (*Dodonaea viscosa* var. *angustifolia*), Taaibos (*Rhus undulata*), Bittergombos (*Lycium ferocissimum*), Kraalbos (Aizoon africanum L.), Renosterbos (*Elytropappus rhinocerotis*), *Pteronia sp.* and Cotton Milkweed (*Gomphocarpus fruticosus*). Vegetation marking wetter areas included *Ischyrolepis gaudichaudiana*, *Platycaulos major*, *Cyperus congestus*, *Merxmuellera stricta*, *Juncus sp*. and the common reed (*Phragmites australis*).

Fauna

No aquatic-dependent fauna of special concern was observed during the field survey; however, several bird species were noted in the wetter areas. As the site borders a protected area to the southeast, the stream corridors are also expected to serve as migration routes for surrounding wildlife.

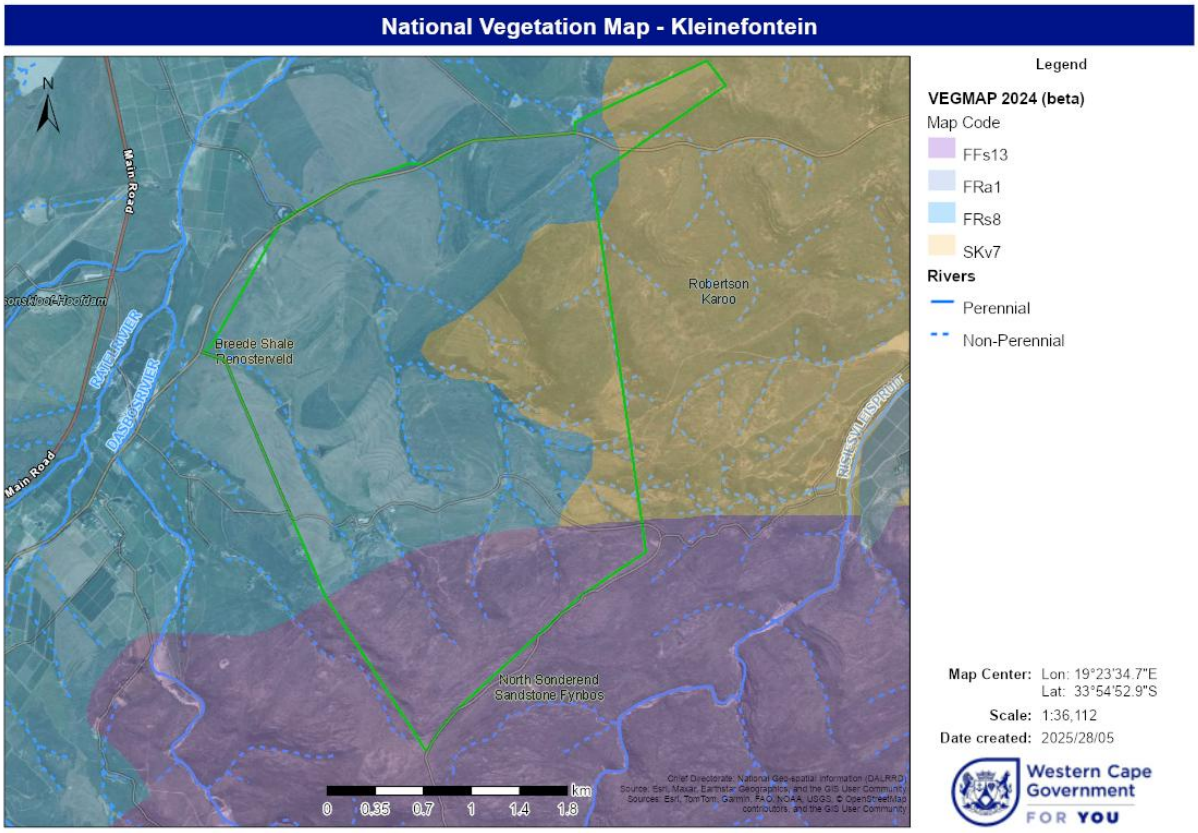


Figure 5: National vegetation map for the project site (green polygon) (CFM, 2025).

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 6), several terrestrial Critical Biodiversity Areas (CBA's) were found along the remaining natural areas on the property. These areas are areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure, and such areas are to be maintained in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

Furthermore, aquatic Ecological Support Areas (ESA1: Ground Water Source) were also indicated specifically towards the south and east of the property. These areas play a vital role in helping to sustain the baseflow of surrounding rivers, wetlands, and streams during dry periods.

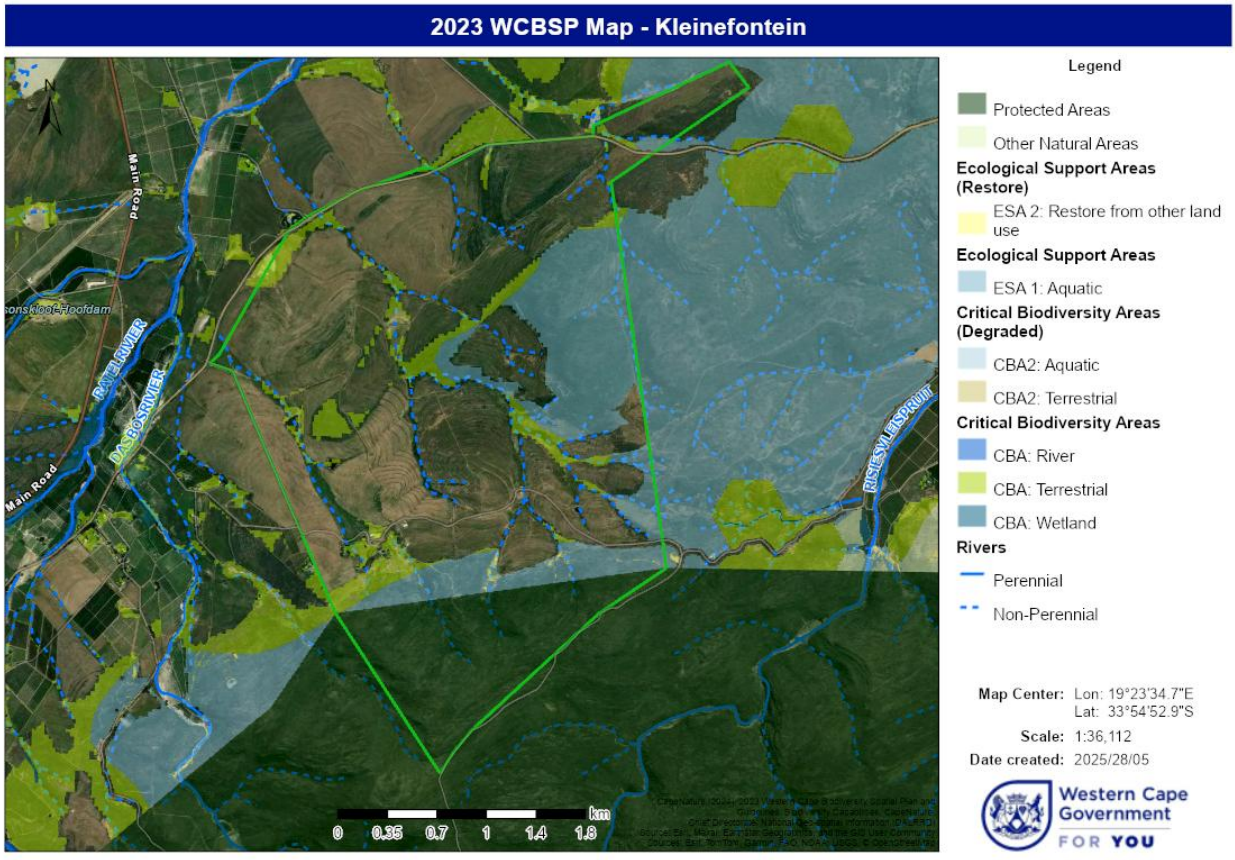


Figure 6: 2025 Western Cape Biodiversity Spatial Plan for the project site (green polygon) (CFM, 2025).

NFEPA map

Freshwater Ecosystem Priority Areas (FEPAs) are strategic spatial priorities identified to support the long-term conservation of freshwater ecosystems and the sustainable use of water resources. According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5) (refer to Figure 10), the broader catchment in which the project site is located is classified as a FishFEPA (Fish support area).

FishFEPAs, or fish sanctuaries, are sub-quaternary catchments that are critical for the protection of threatened and near-threatened freshwater fish species indigenous to South Africa. These catchments are denoted by either a red or black fish symbol on the map. The sub-quaternary catchment associated with the project area is marked with a black fish, indicating the presence of at least one population of vulnerable or near-threatened fish species, or a population of special concern. The primary objective of FishFEPAs is to prevent further decline in the condition of aquatic ecosystems, particularly those supporting sensitive fish species. As such, no further deterioration in river condition should occur within fish sanctuaries, and no new permits should be issued for the introduction or stocking of invasive alien fish species in these catchments.

In addition to the above, the National Wetlands Map classifies the Ratel River and its larger associated floodplain as East Coast Shale Renosterveld_Floodplain wetland, currently in a C condition (FEPA rank 5). These wetlands are marked as being critically endangered – both from a vegetation and wetland ecosystem perspective.

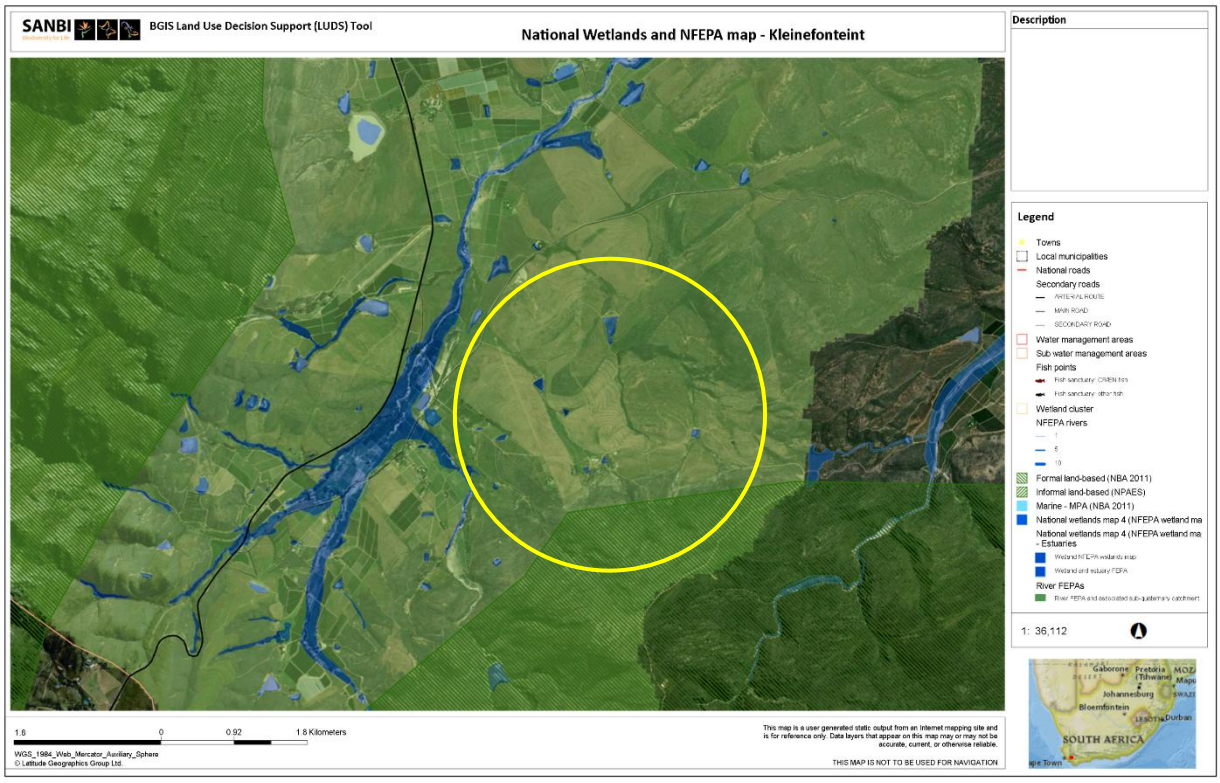


Figure 7: NFEPA map for the larger area surrounding the Project site (yellow circle)(SANBI GIS, 2025).

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 beginning of the wet season, with the site visit done on 29 April 2025. Freshwater features found within the project site included several small seasonal tributaries of the Ratel River with their associated wet areas.

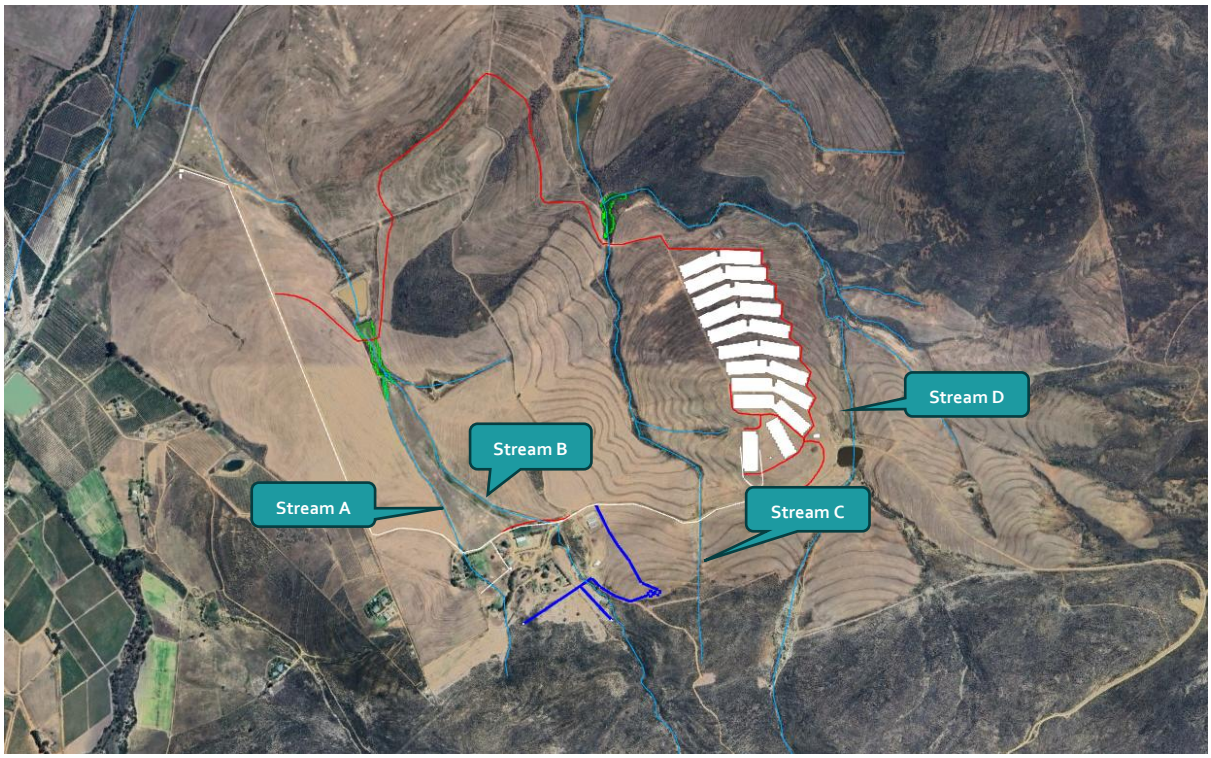


Figure 8: Satellite imagery indicating the project site with the proposed new roads (red lines), the broiler area (white polygons) as well as the affected streams (blue lines) with their associated wetland areas (green polygons).

For the purpose of this report, the freshwater features on site are referred to as Streams A to D (shown in Figure 8). All four streams are primarily seasonal, with permanently wet areas observed along their channels, suggesting a degree of groundwater contribution to baseflow. They originate in the hills to the southeast and flow generally in a north-northwestern direction, where Streams A and B, and Streams C and D converge, respectively, before joining the Ratel River.

The upper reaches of these streams remain largely in a natural state; however, their condition deteriorates to varying degrees (moderately to seriously modified) upon entering farmed areas. In these sections, several historic impacts have been observed, including vegetation removal, agricultural encroachment into riparian zones, the construction of instream dams, and artificial

canalisation, particularly in Streams A and B. Both of these converged stream systems terminate in large farm dams shortly before reaching the Ratel River.

A large portion of the Streams A and B system likely historically comprised an unchanneled valley-bottom wetland. However, this area has been so extensively modified that it has lost all ecological function. Only a small remnant of the wetland remains at the confluence of the two streams. In contrast, Streams C and D have been the least impacted, with large sections still ranging from largely natural to moderately modified in condition.

Due to their similar condition and geomorphological characteristics, as well as the fact that they form two distinct tributaries, Streams A and B were assessed as a single unit, as were Streams C and D.

Geomorphological and Ecological Assessment

The freshwater features mentioned above were assessed using the Classification System for Wetlands and Other Aquatic Ecosystems in South Africa (Ollis et al., 2013). Additionally, the River Index of Habitat Integrity (IHI) for rivers and streams, were utilised to determine the Present Ecological State (PES) of the affected freshwater features. Together with the Ecological Importance and Sensitivity (EIS) method, these tools were employed to evaluate the ecological condition, functional performance, and overall importance of the rivers, streams or wetlands on site.

Based on the above assessments, the Recommended Management Objective (RMO) and Recommended Ecological Class (REC) were determined. These approaches provide a comprehensive understanding of the streams' current state, their ecological roles, and their significance in terms of biodiversity and resilience. They also offer valuable insights into the key ecological drivers influencing these systems. Each freshwater feature has been evaluated using the methodology outlined in ***Annexure 1***, and detailed results of these assessments are provided in ***Annexure 2***.

TABLE 2: SUMMARY OF THE RIVER ASSESSMENT FOR THE UNNAMED TRIBUTARIES

	Stream A and B	Streams D and E
DWA catchment	H40F	
Vegetation type	Breede Shale Renosterveld (Critically Endangered)	
Rainfall region	Winter	
System	Inland System	
Regional Setting	Western Folded Mountains	
Landscape unit	Slope to Valley Floor	
Hydrogeomorphic Unit	Stream (Seasonal)	
Longitudinal zonation/Landform/ Outflow drainage	Foothill - Sand Bed	
Landform/Inflow drainage	Active Channel	
Substratum type	Loam and Clay	

Special conservational features (from desktop study)	**WCSBP (2017)**	Based on the 2023 WCBSP map (Figure 6), terrestrial Critical Biodiversity Areas (CBA's) were found around the remaining natural areas on the property Furthermore, aquatic Ecological Support Areas (ESA1: Ground Water Source) were also indicated specifically towards the south and east of the property.	
	NFEPA	According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5) (refer to Figure 10), the broader catchment in which the project site is located is classified as a FishFEPA (Fish support area). In addition to the above, the National Wetlands Map classifies the Ratel River and its larger associated floodplain as East Coast Shale Renosterveld_Floodplain wetland, currently in a C condition (FEPA rank 5).	
PES	D/E: Largely to Seriously modified		A/B: Natural to Largely Natural
EIS	Low to Moderate		High
RMO and REC	RMO – D: Maintain; REC – D		RMO – A: Maintain; REC – A/B
Proposed Buffer Zone	**Road Crossings:** As the proposed work will occur within the stream channels, the implementation of a buffer zone is not considered feasible. **Other Activities:** All other activities should be located outside a 30-meter buffer zone measured from the edge of the streams' riparian areas.		

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.

Of the proposed project components, only the new stream crossings will directly impact the freshwater features on site. Additionally, the nature of the development (a chicken broiler facility) could potentially pose a risk of indirect impacts on water quality, primarily affecting Streams C and D, as well as some limited hydrological impacts during the maintenance phase.

These activities might impact on the following:

- Loss of biodiversity, aquatic habitat and ecological structure;
- Potential hydrology modification and change in sediment balance;
- Potential Water Quality impacts.

Potential Impact – Loss of biodiversity and ecological structure:

The proposed activities involve the installation of three new road crossings, two over Streams A and B, and one over Stream C, as well as one pipeline crossing over Stream B. The road crossings will require soil excavation, vegetation clearance, and in-stream construction, and are therefore expected to have a definite impact on biodiversity and ecological structure at the crossing points. In contrast, the pipeline crossing will consist of a treated timber pole spanning the watercourse, with the pipeline mounted above the stream. As this method avoids direct disturbance to the streambed and banks, it is expected to have minimal impact on the aquatic environment.

Streams A and B have already been assessed as being in a largely to seriously modified state with low EIS at the proposed crossing locations, with significant existing alterations to the streambed and banks, as well as extensive vegetation removal. Consequently, the construction of road crossings over Streams A and B is expected to result in a **short-term, low negative impact**.

Although the general condition of Stream C was found to be in a largely natural state with high EIS, the proposed road crossing will be located at an existing informal crossing that has already undergone vegetation clearance and soil compaction. The formalisation of this crossing, combined with the rehabilitation of the surrounding disturbed areas, is anticipated to result in a **long-term, low to medium positive impact on the directly surrounding section of the stream**.

Mitigation measures:

To try and minimise this impact, the following mitigation measures are proposed.

Construction Phase:

- All road crossing structures must be designed to avoid obstruction of streamflow, including low flows.
- Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.
- If any flow is present within the streams during construction, appropriate measures must be taken to divert the water around the work area and ensure its release downstream.
- A buffer zone extending 6 meters upstream and downstream of the construction footprint should be clearly demarcated. No disturbance or activity should occur beyond these designated areas within the stream channel.
- The boundaries of this buffer zone must be physically demarcated using high-visibility fencing or flagging prior to the commencement of any construction activities.
- Work within the stream channels should be limited strictly to essential areas.
- Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.

- All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete.

Operational Phase:

- All rehabilitated and revegetated areas within the wetland/stream areas should be monitored for the following 2 years, ensuring the establishment of good plant biodiversity.
- Monitoring of all stream crossings for signs of erosion, debris build-up or nuisance growth around the culverts, should be included and addressed in a formal Maintenance and Management Plan for the project.
- No use of machinery is allowed within any wetland/stream channels for the operational phase.
- All debris must be removed and properly disposed of.
- No dumping of debris should be allowed in the stream/wetland areas.
- Any wetland/ riparian or instream areas disturbed by Maintenance activities to be rehabilitated and revegetated (if necessary) after maintenance works

Impact with mitigation measures:

Should all mitigation measures be taken into account, the general impact of the above activities would be deemed to be of:

- **Construction Phase**: Short-term, Low Negative nature
- **Operational Phase:** Long Term, Low to Medium Positive nature**.**

Potential Impact - Water Quality Impairment:

During the construction phase, vegetation clearing and physical disturbances to stream banks and wetland areas at freshwater crossings may increase the risk of erosion and subsequent sedimentation in downstream freshwater systems. Additionally, construction activities inherently carry a risk of general pollution, which could lead to the degradation of surface water quality in receiving freshwater features. This impact is expected to be of a **short-term, low to medium negative nature**, affecting the immediate surrounding freshwater environment.

Looking at operational phase impacts, the nature of the proposed development, a chicken broiler facility located on a slope, poses a potential risk of significant water quality degradation in nearby freshwater systems. Broiler litter is typically rich in nutrients, microbes, organics, and trace metals; therefore, runoff from the broiler site could lead to eutrophication in downstream areas, particularly following the first seasonal rains. If not properly mitigated, such runoff could substantially degrade water quality and indirectly impact aquatic biodiversity associated with the streams.

The client has indicated that management practices will include dry sweeping and the removal of manure, followed by high-pressure washing of broiler areas, with wash water directed into surrounding pastures. In addition, as part of a stormwater management plan, the construction of stormwater swales along access roads is proposed, designed to accumulate runoff in designated dry pans.

Should the above be applied, the operational phase of the project is expected to have a **very low negative impact on water quality within Streams C and D**.

Mitigation measures:

The following mitigation measures are proposed to minimise any impacts:

Construction Phase:

- As mentioned above, construction activities should preferably take place during the drier months, and special attention should be given to managing water quality impacts in the construction Environmental Management Programme (EMP).
- Temporary silt fencing, sandbags, or berms should be installed within downstream channels to prevent sediment generated during construction from entering downstream freshwater features.
- Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only.
- Designate stockpile locations at least 50 metres away from any watercourses or wetland areas.
- Prevent contaminated runoff from construction sites from entering adjacent streams or wetlands by using diversion drains and berms. Temporary detention basins or sediment traps should be constructed to capture excess sediment before it reaches wetland or stream areas.
- Good Site Management Practices include:
    - Portable chemical toilets must be provided at all work sites, or ensure that conveniently located site toilets are available. Toilet facilities must not be located within 100 metres of any stream or wetland areas.
    - Maintain and clean toilets regularly to ensure they remain in good working order and hygienic condition.
    - No waste or foreign materials may be dumped into streams or wetlands. These areas must also not be used for cleaning clothing, tools, or equipment.
    - Prevent the discharge of water containing polluting matter or visible suspended solids directly into streams or wetland areas.
    - Immediately clean any accidental oil or fuel spills or leaks. Do not hose or wash spills into the surrounding natural environment.
    - All operations involving the use of cement and concrete (outside of the batching plant) must be carefully controlled.
    - Limit cement and concrete mixing to designated sites wherever possible.

Operational Phase

- The existing plans would sufficiently address the possible water quality impacts posed by the broiler site.

Impact with mitigation measures:

If these mitigation measures are adhered to, the impact of the proposed upgrade works is expected to have a **Low to very low negative impact on the water quality of downstream freshwater features.**

Potential Impact – Flow modification and change in sediment balance:

The following flow modification impacts are expected during the construction and operational phases of the project.

Construction Phase

- If flow is present during construction, activities within the streams and associated wetland areas may impede flow, resulting in short-term hydrological modifications to downstream wetland features and potentially causing prolonged inundation of upstream wetland areas.
- Although construction is planned for the drier summer months, the risk of flow disruption remains. Warm and dry conditions may exacerbate impacts by reducing the availability of low/baseflows, thereby affecting ecosystems downstream that rely on these flows for ecological functioning.

Operational Phase

- The initial design for the proposed stream crossings (now the **alternative option**), particularly at the confluence of Streams A and B and at the lower crossing over Stream C, did not accommodate subsurface flow. This would have impeded groundwater movement and likely caused fragmentation and possible desiccation of downstream wetland areas associated with these reaches. In response, the **preferred option** now incorporates subsurface drainage via a no-fines sub-soil drain and an embedded pipe network to maintain hydrological connectivity and lower any flow modification impacts associated with these structures. Engineer plans for both the preferred and alternative options have been added under Annexure C.

Mitigation measures:

In order to reduce the possible impact of any flow modifications occurring, the following mitigation is proposed.:

Construction Phase:

- Low water bridges should be installed at or slightly below the natural streambed level to avoid obstructing low flows and to facilitate the unimpeded movement of aquatic biota.
- As mentioned under "Loss of Biodiversity", should flow be present during construction, temporary diversion structures should be implemented to reroute stream and wetland flow

around the active work area, ensuring that low flows remain uninterrupted throughout the construction period.

- As the client proposes to include subsoil drainage in the low-water bridge structures, the following mitigation should be taken into account:
    - Drainage should consist of several pipes or a continuous stone layer.
    - The subsoil drain's cross-sectional area should roughly match or exceed the flow cross-section of the natural subsurface seepage path, both up and downstream of the bridge. This should be at a minimum 0.3–0.5 m depth and width.
    - The subsoil drain must be wrapped in geotextile or similar to keep fine wetland sediments out.
    - Stone size must be uniform and coarse to maintain voids for long-term flow.

Operational Phase

- Regular maintenance should be conducted to remove debris accumulation and control nuisance vegetation growth, as outlined under the "Loss of Biodiversity" section, to prevent blockages and ensure continued flow over the bridge structure.

Impact with mitigation measures:

Should all mitigation measures be taken into account, the general impact of the above activities would be deemed to be of:

- **Construction Phase**: Short-term, Low Negative nature
- **Operational Phase:** Long Term, Low to Negligible Negative nature.

Summary of the expected impacts:

TABLE 3: SUMMARY OF THE EXPECTED IMPACTS RELATING TO THE CONSTRUCTION PHASE.

SITE CLEARANCE, CONSTRUCTION PHASE		
	Preferred Alternative	
Nature of impact:	Development of the new Chicken broiler and associated infrastructure.	
Description and consequence of impact or risk:	Impacts causing loss of the aquatic ecology and biodiversity of all the indicated stream crossings.	
Indirect impacts:	Water quality impairment and possible erosion, as well as flow modification within the marked streams and associated wet areas.	
	Without mitigation	**With mitigation**
MAGNITUDE of impact:	**Medium (-)** This impact could result in a remarkable alteration of the aquatic function and processes within the directly surrounding freshwater features.	**Low (-)** This impact could result in a slight alteration of the aquatic function and processes within the directly surrounding freshwater features.
DURATION:	**Short term**	

SITE CLEARANCE, CONSTRUCTION PHASE		
	Preferred Alternative	
	0-3 years.	
EXTENT (special scale/ influence of impact):	**Local** The impacted area should be limited to the site and the immediate surrounding area.	
IRREPLACEABLE loss of resources:	**Medium potential** Resources can be replaced with effort.	
INTENSITY and degree to which the impact can be REVERSED:	**Medium** With no mitigation in place, the natural processes of the affected freshwater features could be remarkably altered. Natural functions and processes can be reversed to their pre-activity state.	
PROBABILITY of occurrence:	**Medium** There is a distinct probability that the impact will occur.	
Significance rating of impact <u>without</u> <u>and with</u> mitigation:	**Medium-Low (-)** The overall significance of the above potential impact is predicted to be Medium-high, without mitigation. Impacts are important and require mitigation measures to reduce the negative impacts to acceptable levels.	**Low (-) to Low (+)** With mitigation, the overall significance of the above potential impacts is predicted to be low, with mitigation, and within the acceptable range.
Cumulative impact (with mitigation):	**Low on the larger freshwater system**	

TABLE 4: SUMMARY OF THE EXPECTED IMPACTS RELATING TO THE OPERATION PHASE.

OPERATIONAL PHASE		
	Preferred Alternative	
Nature of impact:	Operation of the Brioler site as well as proposed bridge maintenance activities.	
Description and consequence of impact or risk:	The most significant impact during the operational phase is expected to be limited flow modification and loss of biodiversity resulting from ongoing future maintenance activities.	
Indirect impacts:	A small possibility of a reduction in water quality through the operation of the broiler, which could cause eutrophication and limited loss in biodiversity in the surrounding streams C and D (where only the most sensitive species will be affected).	
	Without mitigation	**With mitigation**
MAGNITUDE of impact:	**Low (-)** This impact could result in minimal alteration of the aquatic function and processes within all affected freshwater features, largely through short-term impedance of flow through possible debris build-up around the low water bridges/during the maintenance clearing activities.	**Low (+)** Natural functioning of the environment is restored to some degree, with better flow within the streams through well-functioning bridge and rehabilitated areas.
DURATION:	**Short term**	

OPERATIONAL PHASE		
	Preferred Alternative	
	Although maintenance activities will take place throughout the operational phase of the broiler site, their actual occurrence and associated impacts will be limited to short, intermittent periods.	
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 Medium** Natural functioning of the environment is minimally to remarkably affected. Natural processes can be reversed to their original state.	
PROBABILITY of occurrence:	**Medium Probability** There is a distinct probability that the impact will occur	**Low probability** There is a low probability that the impact will occur
Significance rating of impact <u>without and with</u> mitigation:	**Low to Medium-low (-)** The overall significance of the above potential impact is predicted to be Low to Medium-low, without mitigation. Although impacts fall within an acceptable range, impacts are still considered important, and mitigation measures are required to reduce the negative impacts.	**Very Low (-)** This impact would result in a very limited change in the aquatic function within affected freshwater features.
Cumulative impact:	**Low negative impact on the larger freshwater system**	

Results and recommendations

The site contains four primarily seasonal streams (Streams A to D), which originate in the southeastern hills and flow north-northwest, eventually converging into two tributaries before joining the Ratel River. While their upper reaches remain natural, the streams become modified to varying degrees in farmed areas due to vegetation clearance, agricultural encroachment, instream dams, and canalisation, especially in Streams A and B. Both tributaries terminate in large farm dams near the Ratel River.

Due to their similar condition and geomorphological characteristics, as well as the fact that they form two distinct tributaries, Streams A and B were assessed as a single unit, as were Streams C and D. The freshwater assessment result can be summarised as follows:

TABLE 5. SUMMARY OF THE RIVER ASSESSMENT FOR THE UNNAMED TRIBUTARIES

	Stream A and B	Streams D and E
DWA catchment	H40F	
Vegetation type	Breede Shale Renosterveld (Critically Endangered)	

Rainfall region	Winter		
System	Inland System		
Regional Setting	Western Folded Mountains		
Landscape unit	Slope to Valley Floor		
Hydrogeomorphic Unit	Stream (Seasonal)		
Longitudinal zonation/Landform/ Outflow drainage	Foothill - Sand Bed		
Landform/Inflow drainage	Active Channel		
Substratum type	Loam and Clay		
Special conservational features (from desktop study)	**WCSBP (2017)**	Based on the 2023 WCBSP map (Figure 6), terrestrial Critical Biodiversity Areas (CBA's) were found around the remaining natural areas on the property Furthermore, aquatic Ecological Support Areas (ESA1: Ground Water Source) were also indicated specifically towards the south and east of the property.	
	NFEPA	According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset and the National Wetlands Map (NWM5) (refer to Figure 10), the broader catchment in which the project site is located is classified as a FishFEPA (Fish support area). In addition to the above, the National Wetlands Map classifies the Ratel River and its larger associated floodplain as East Coast Shale Renosterveld_Floodplain wetland, currently in a C condition (FEPA rank 5).	
PES	D/E: Largely to Seriously modified		A/B: Natural to Largely Natural
EIS	Low to Moderate		High
RMO and REC	RMO – D: Maintain; REC – D		RMO – A: Maintain; REC – A/B
Proposed Buffer Zone	**Road Crossings:** As the proposed work will occur within the stream channels, the implementation of a buffer zone is not considered feasible. **Other Activities:** All other activities should be located outside a 30-meter buffer zone measured from the edge of the streams' riparian areas.		

Of the proposed project components, only the new stream crossings will directly impact the freshwater features on site. Additionally, the nature of the development (a chicken broiler facility), together with some management activities, could potentially pose a risk of indirect impacts on water quality and hydrology.

These activities might have an impact on the following:

- Loss of biodiversity, aquatic habitat and ecological structure;
- Potential hydrology modification and change in sediment balance;
- Potential Water Quality impacts.

In order to mitigate the above, several mitigation measures have been included and would be applicable to all affected freshwater features/stream crossings along the road.

Conclusion

With the implementation of appropriate mitigation measures, the proposed activities with their expected operational phase are expected to result in a general short-term **low negative impact** on the site's freshwater features.

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**.

As all the indicated freshwater features found within the project site would be defined as a watercourse, any activities that are to take place within 32 meters thereof could require authorisation in terms of the relevant regulations of NEMA. In addition, Section 21 of the National Water Act and Regulation 1199 of 2009, as it relates to the NWA, will also apply, and therefore, a Water Use License will usually be required for the proposed development unless a General Authorisation is granted.

References:

Department of Water Affairs and Forestry. (1999). *Resource Directed Measures for Protection of Water Resources. Volume 3: River Ecosystems Version 1.0*. Resource Directed Measures for Protection of Water Resources, Pretoria, South Africa.

Department of Water Affairs and Forestry, 2005. A practical field procedure for identification and delineation of wetlands and riparian areas. Final Draft. DWAF, Pretoria, South Africa.

DWAF (2007). *Manual for the assessment of a Wetland Index of Habitat Integrity for South African floodplain and channelled valley bottom wetland types* by M. Rountree (ed); C.P. Todd, C. J. Kleynhans, A. L. Batchelor, M. D. Louw, D. Kotze, D. Walters, S. Schroeder, P. Illgner, M. Uys. and G.C. Marneweck. Report no. N/0000/00/WEI/0407. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria, South Africa.

Driver, Nel, Snaddon, Murray, Roux, Hill. (2011). *Implementation Manual for Freshwater Ecosystem Priority Areas*. Draft Report for the Water Research Commission.

Kleynhans C.J., Thirion C. and Moolman J. 2005. A Level 1 Ecoregion Classification System for South Africa, Lesotho and Swaziland. Report No. N/0000/00/REQ0104. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria

Macfarlane, D.M., Bredin, I.P., Adams, J.B., Zungu, M.M., Bate, G.C. and Dickens, C.W.S. 2014. *Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report.* WRC Report No TT 610/14, Water Research Commission, Pretoria

Macfarlane D; Kotze D; Ellery W; Koopman V; Goodman PS; Goge M; Walters D. 2009. WET-Health. WRC Report No TT 340/09, Water Research Commission, Pretoria

Marnewecke, G. & Kotze, D., 1999. Appendix W6: Guidelines for delineating the boundaries of a wetland and the zones within a wetland in terms of the South African Water Act. Version 1.0. Department of Water Affairs and Forestry, Pretoria, South Africa.

Mucina, L. and Rutherford, M. C. (eds.) (2004) *Vegetation map of South Africa, Lesotho and Swaziland*. Strlitzia 18. South African National Biodiversity Institute, Pretoria.

National Environmental Management Act (NEMA) 107 of 1998

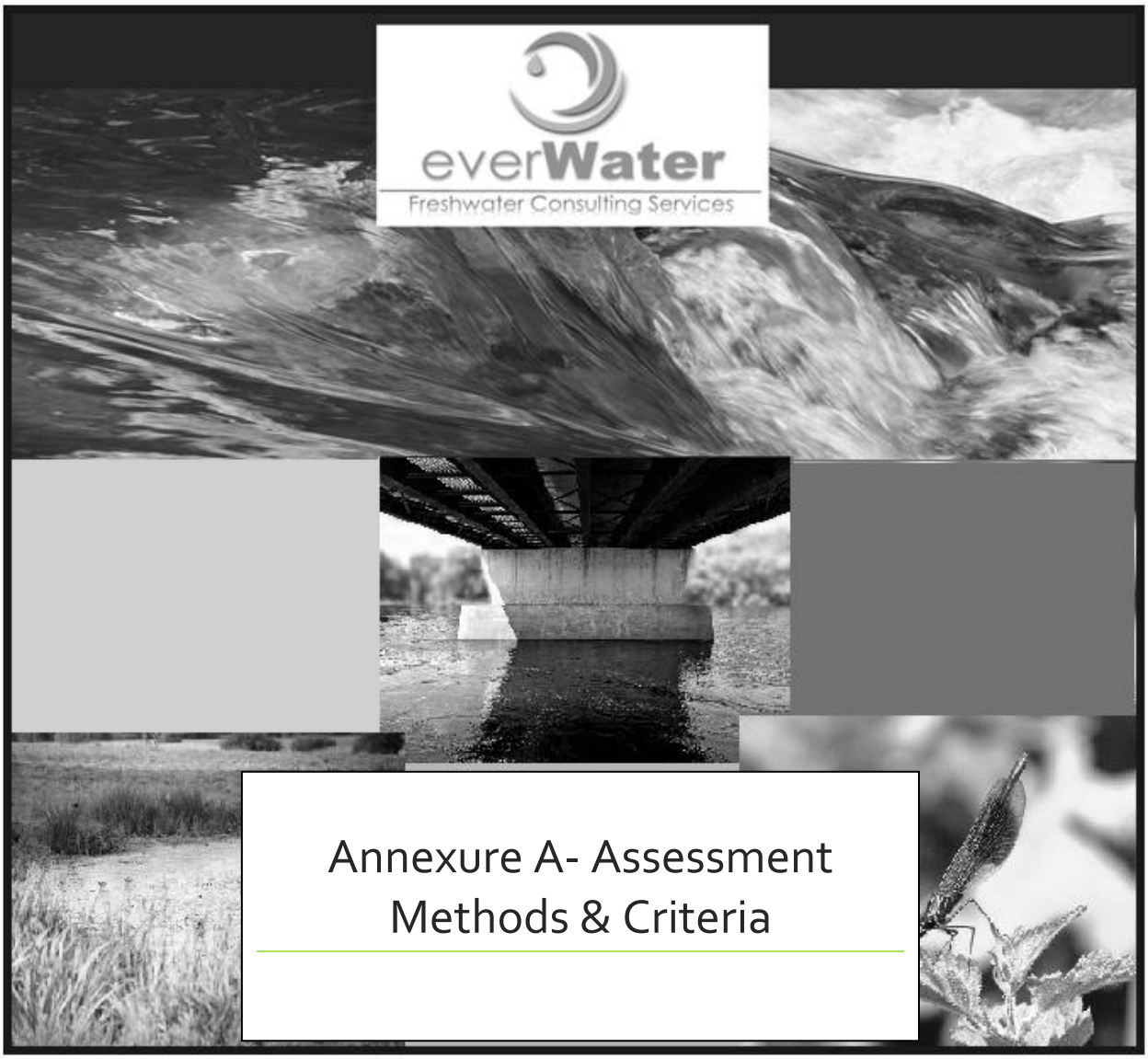
National Water Act 36 of 1998. Section 21(c) and (i).

SANBI Biodiversity GIS. http://bgis.sanbi.org

SANBI (2009). Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute (SANBI).

Van Ginkel, C. E., Glen, R. P., Gordon-Gray, K. D., Cilliers, C. J., Muasya, M. and P. P. van Deventer (2011) *Easy identification of some South African wetland plants.* WRC Report No TT 479/10

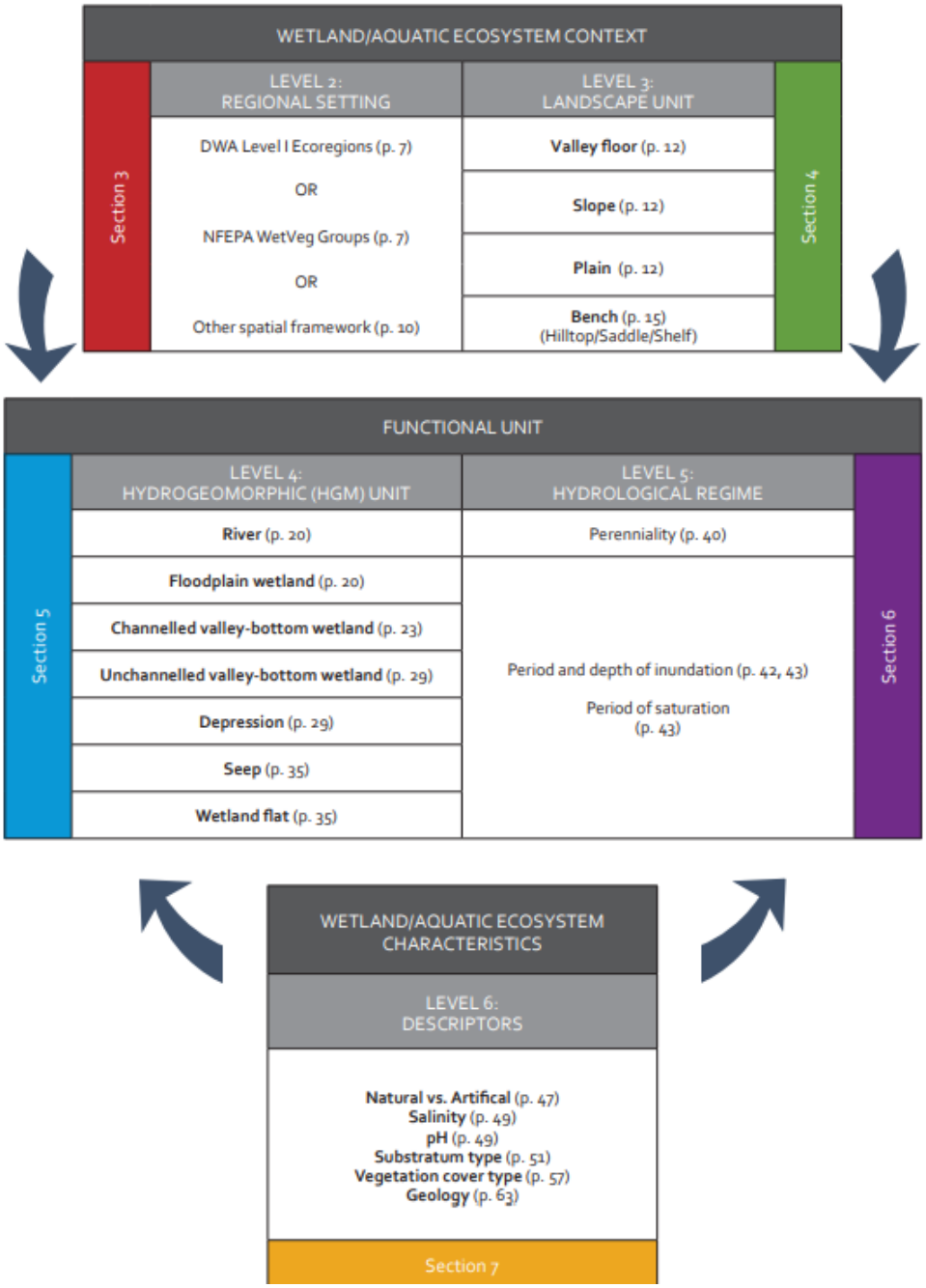
WRC. (2011). *Atlas for Freshwater Ecosystem Priority Areas* – Maps to support sustainable development of water resources (WRC Report No. TT 500/11).


everWater
Freshwater Consulting Services
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

River Habitat integrity (PES)

The habitat integrity of a river refers to the maintenance of a balanced composition of physico-chemical and habitat characteristics on a temporal and spatial scale that is comparable to the characteristics of natural habitats of the same region (Kleynhans 1996). The determination and categorization of the state of various biophysical attributes of rivers relative to the natural or close to the natural reference condition provides the information needed to derive desirable and attainable future ecological objectives for the river as well as determine to which degree it has been altered from its natural state.

During the habitat integrity assessment, the instream and riparian zone aspects of the river or stream are assessed in terms of the number and severity of disturbances on the stream. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of the degradation of a river. The river type context is also taken into account in order to consider the weight of the abovementioned metrics on both the instream and riparian zone and includes the flow regime, geomorphic zone as well as size of the river assessed.

The result of the integrity assessment is a percentage that is used to derive a descriptive habitat integrity category for the instream and riparian zone components and is also used as an indicator on the Present Ecological State (PES).

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)	>3-4

	are usually very sensitive to flow modifications and have no or only a small capacity for use.	
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.

Impact Assessment Criteria

The freshwater impacts are rated in accordance with the Environmental Impact Assessment Regulations, 2014, as amended, and the criteria are 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).

The following criteria have been used to evaluate the significance of impacts:

- **Nature**: This is an appraisal of the type of effect the activity is likely to have on the affected environment. The description includes what is being affected and how. The nature of the impact will be classified as positive or negative, and direct or indirect.
- **Extent and location**: This indicates the spatial area that may be affected

Rating	Extent	Description
1	Site	Impacted area is only at the site – the actual extent of the activity.
2	Local	Impacted area is limited to the site and its immediate surrounding area
3	Regional	Impacted area extends to the surrounding area, the immediate and the neighbouring properties.
4	Provincial	Impact considered of provincial importance
5	National	Impact considered of national importance – will affect entire country.

- **Duration**: This measures the lifetime of the impact

Rating	Duration	Description
1	Short term	0 – 3 years, or length of construction period
2	Medium term	3 – 10 years
3	Long term	> 10 years, or entire operational life of project.
4	Permanent – mitigated	Mitigation measures of natural process will reduce impact – impact will remain after operational life of project.
5	Permanent – no mitigation	No mitigation measures of natural process will reduce impact after implementation – impact will remain after operational life of project.

- **Intensity/magnitude**: This is the degree to which the project affects or changes the environment; it includes a measure of the reversibility of impacts

Rating	Intensity	Description
1	Negligible	Change is slight, often not noticeable, natural functioning of environment not affected.
2	Low	Natural functioning of environment is minimally affected. Natural, cultural and social functions and processes can be reversed to their original state.
3	Medium	Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.
4	High	Cultural and social functions and processes disturbed – potentially ceasing to function temporarily.
5	Very high	Natural, cultural and social functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.

- **Probability**: This is the likelihood or the chances that the impact will occur

Rating	Probability	Description
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur is low due to its design or historic experience.
3	Medium	There is a distinct probability of the impact occurring.
4	High	It is most likely that the impact will occur
5	Definite	The impact will occur regardless of any prevention measures.

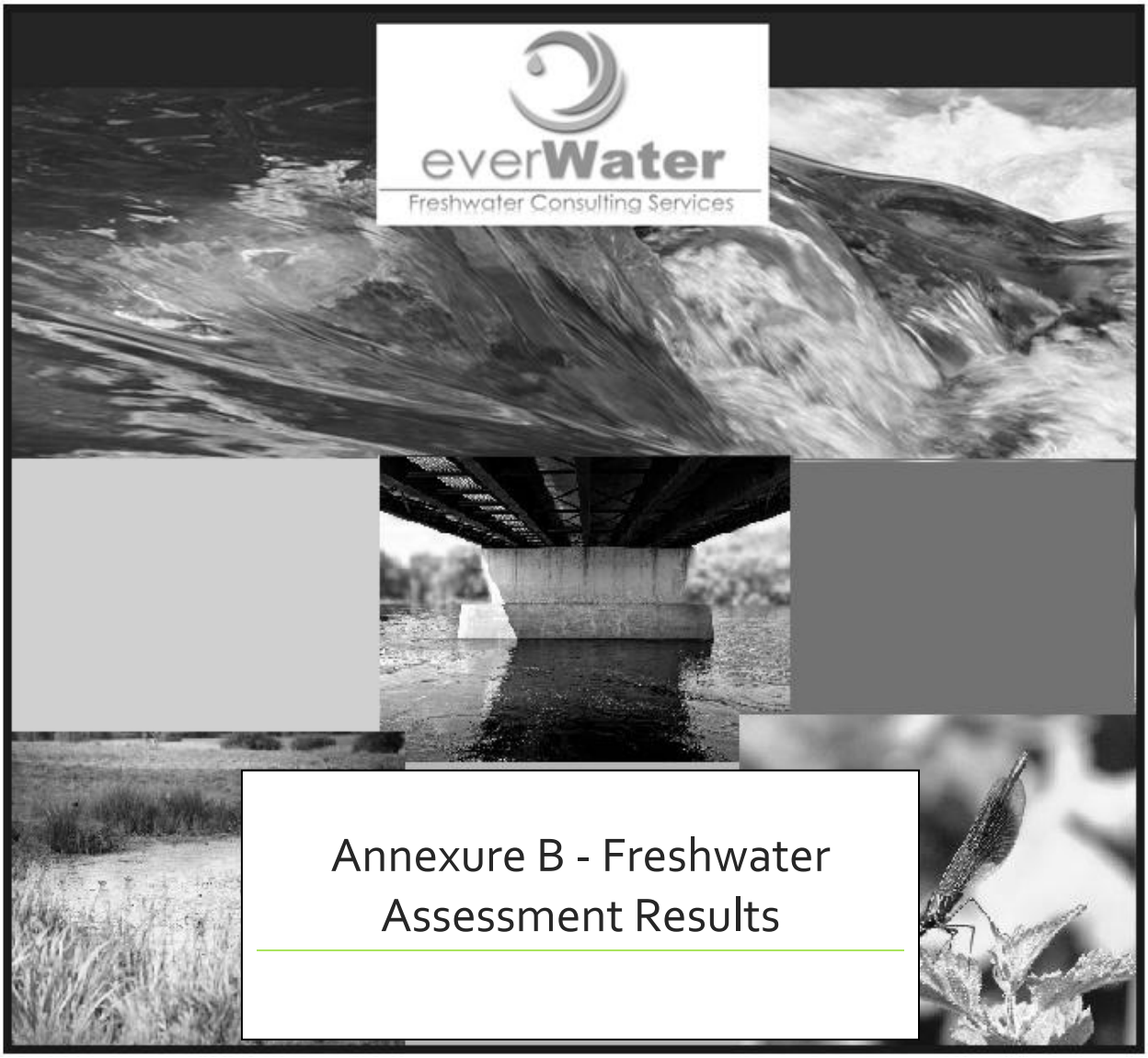
- **Potential for irreplaceable loss of resources:** This is the degree to which the project will cause loss of resources that are irreplaceable

Rating	Potential for irreplaceable loss of resources	Description
1	Low	No irreplaceable resources will be impacted.
3	Medium	Resources can be replaced, with effort.
5	High	There is no potential for replacing a particular vulnerable resource that will be impacted.

- **Significance**: The significance will be rated by combining the consequence of the impact and the probability of occurrence (i.e. consequence x probability = significance). The maximum value which can be obtained is 100 significance points

Rating	Significance	Description
1-14	Very low	No action required.
15-29	Low	Impacts are within the acceptable range.
30-44	Medium-low	Impacts are within the acceptable range but should be mitigated to lower significance levels wherever possible.
45-59	Medium-high	Impacts are important and require attention; mitigation is required to reduce the negative impacts to acceptable levels.
60-80	High	Impacts are of great importance, mitigation is crucial.
81-100	Very high	Impacts are unacceptable.

- **Cumulative Impacts**: This refers to the combined, incremental effects of the impact. The possible residual impacts will also be considered



Annexure B - Freshwater Assessment Results

Habitat Integrity (PES)

IHI Assessment and Results:

The following assessment was conducted for Streams A and B, and Streams C and D, respectively, as they were considered similar units based on their condition and geomorphological characteristics. Streams A and B, as well as Streams C and D, each converge near the proposed development area, forming two tributaries that flow toward the Ratel River. This assessment focuses on the condition of the larger stream sections surrounding the proposed road crossings.

TABLE B-1. INDEX OF HABITAT INTEGRITY ASSESSMENT RESULTS AND CRITERIA ASSESSED FOR THE RIPARIAN ZONE OF THE AFFECTED STREAMS AT THEIR STREAM CROSSINGS.

RIPARIAN ZONE HABITAT INTEGRITY	Streams A and B	Streams D and E
Vegetation Removal (Impact 1 - 25)	20	3
Exotic Vegetation (Impact 1 - 25)	0	0
Bank Erosion (Impact 1 - 25)	15	8
Channel Modification (Impact 1 - 25)	15	0
Water Abstraction (Impact 1 - 25)	12	3
Inundation (Impact 1 - 25)	5	0
Flow Modification (Impact 1 - 25)	12	3
Water Quality (Impact 1 - 25)	7	3
INTEGRITY CLASS	**E**	**B**

TABLE B-2. INDEX OF HABITAT INTEGRITY ASSESSMENT RESULTS AND CRITERIA ASSESSED FOR THE INSTREAM ZONE OF THE AFFECTED STREAMS AT THEIR STREAM CROSSINGS.

INSTREAM HABITAT INTEGRITY	Streams A and B	Streams D and E
Water Abstraction (Impact 1 - 25)	14	3
Flow Modification (Impact 1 - 25)	14	3
Bed Modification (Impact 1 - 25)	18	0
Channel Modification (Impact 1 - 25)	15	0
Water Quality (Impact 1 - 25)	5	0

Inundation (Impact 1 - 25)	5	0
Exotic Macrophytes (Impact 1 - 25)	0	0
Exotic Fauna (Impact 1 - 25)	0	0
Rubbish Dumping (Impact 1 - 25)	5	3
INTEGRITY CLASS	**D**	**A**

Findings:

According to the IHI (Index of Habitat Integrity) assessment, Streams A and B were found to be in a *Largely to Seriously Modified* state, in their riparian and instream zones. The primary impacts on these streams include the presence of upstream dams, significant alteration of the original streambed and channel, and loss of riparian vegetation.

Streams D and E were assessed to be in a Natural to *Largely natural* state, with only slight flow modification and bank erosion (natural), found within the stream.

Ecological Importance and Sensitivity (EIS)

TABLE B-3. RESULTS OF THE EIS ASSESSMENT

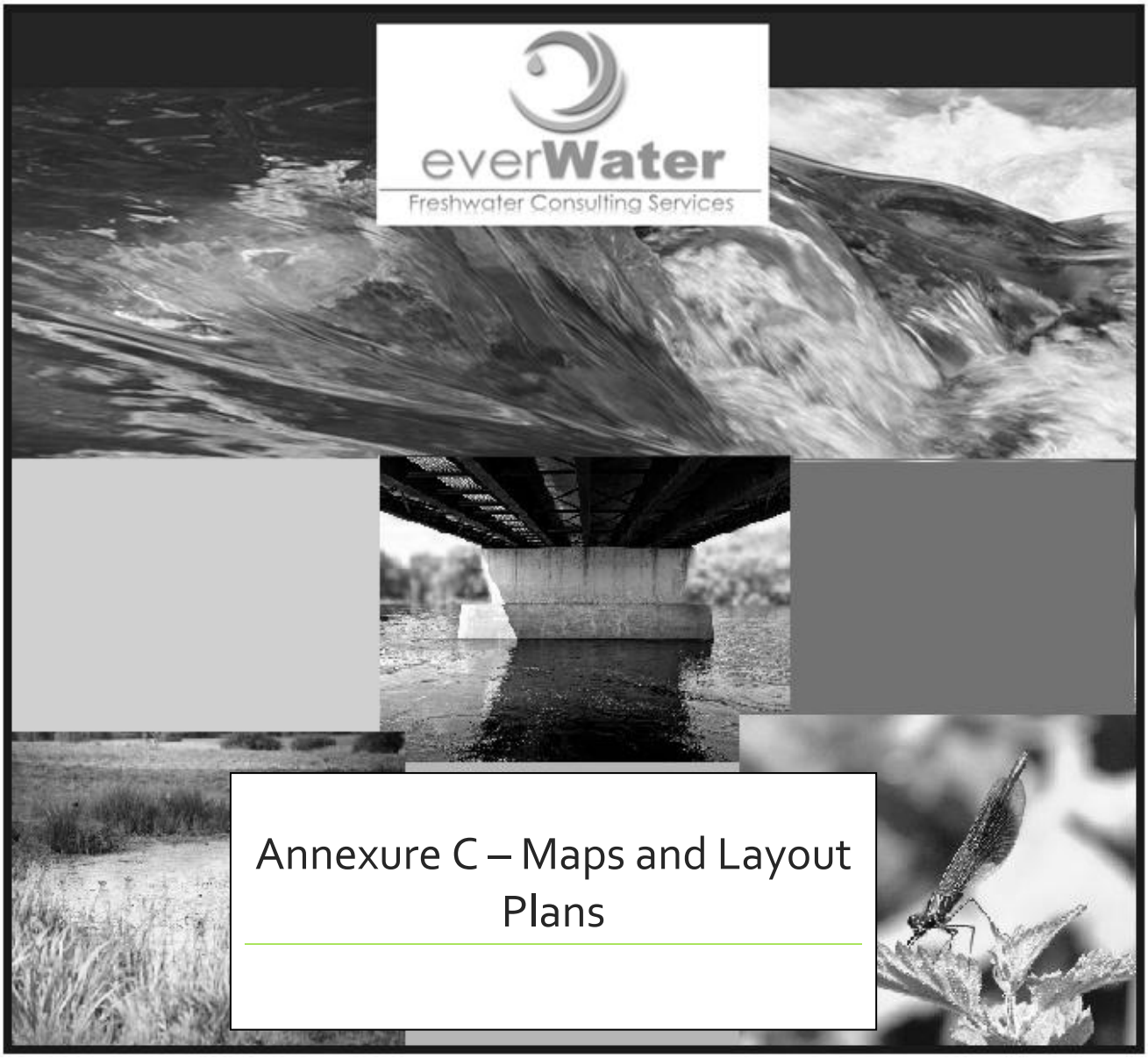
Biotic Determinants	Streams A and B	Streams D and E
Rare and endangered biota	1.5	3
Unique biota	0.5	2
Intolerant biota	1	2
Species/taxon richness	0.5	3
Aquatic Habitat Determinants		
Diversity of aquatic habitat types or features	2	2.5
Refuge value of habitat type	1	2.5
Sensitivity of habitat to flow changes	0.5	1
Sensitivity of flow-related water quality changes	0.5	1
Migration route/corridor for instream and riparian biota	2	2
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	1	1
Total	1.05	2
EIS CATEGORY	**Low to Moderate**	**High**

RMO, REC and Buffer zone.

TABLE B-4. RESULTS OF THE RMO, REC AND BUFFER ZONE ASSESSMENT

	RMO	REC	Buffer zone
Streams A and B	D-Maintain	Resilient systems. A large risk of modifying the abiotic template	**Road crossings**: As the work will occur

		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	within the stream channels at the proposed road crossings, the implementation of a buffer zone is not considered feasible. **<u>Other activities:</u>** All other activities should fall outside of 30m of the stream's riparian zones.
Streams D and E	A-Maintain	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.	


everWater
Freshwater Consulting Services
Annexure C – Maps and Layout Plans

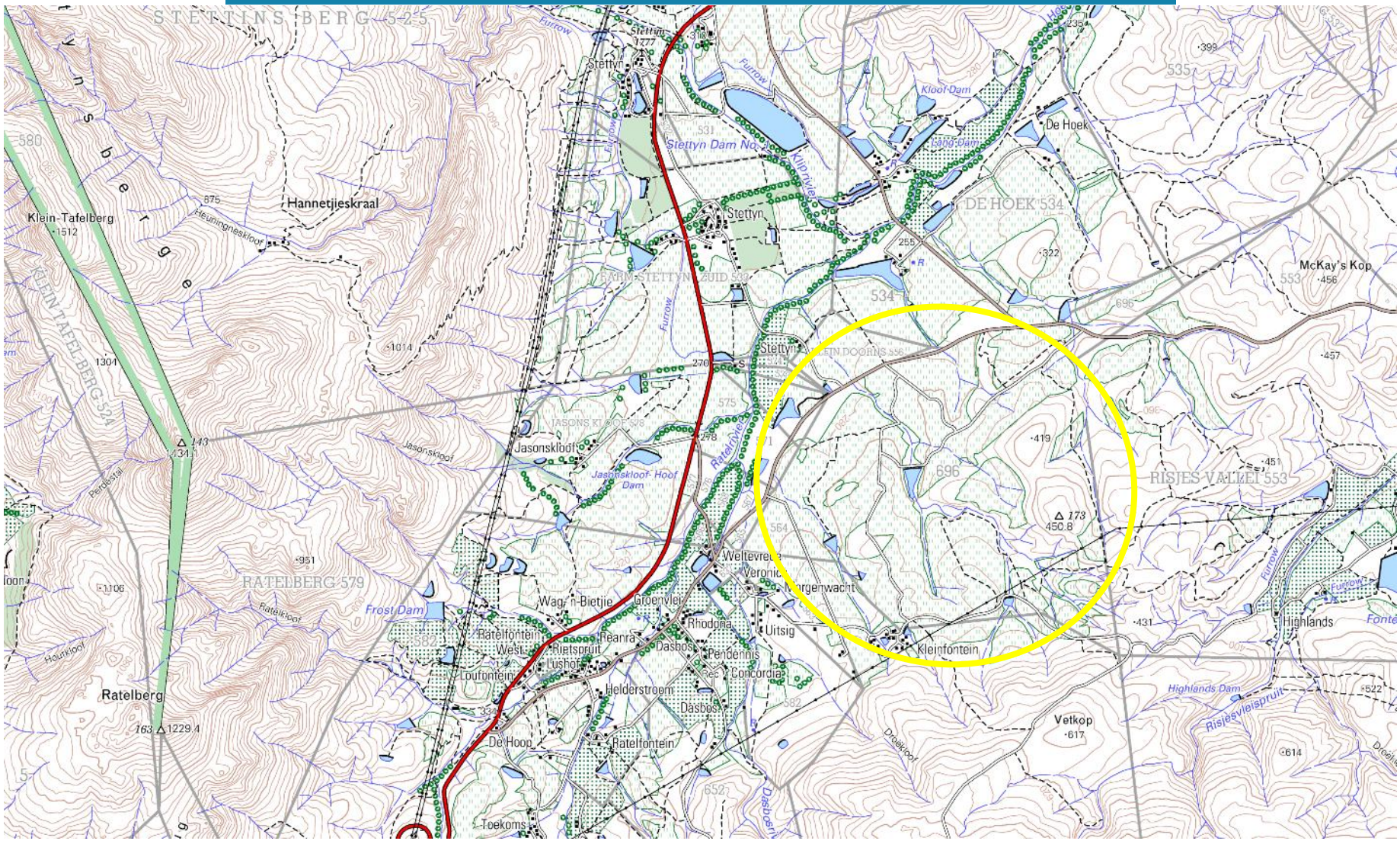


Figure C-1: 1:50 000 Topographical map of the area with the project location (3319CD)

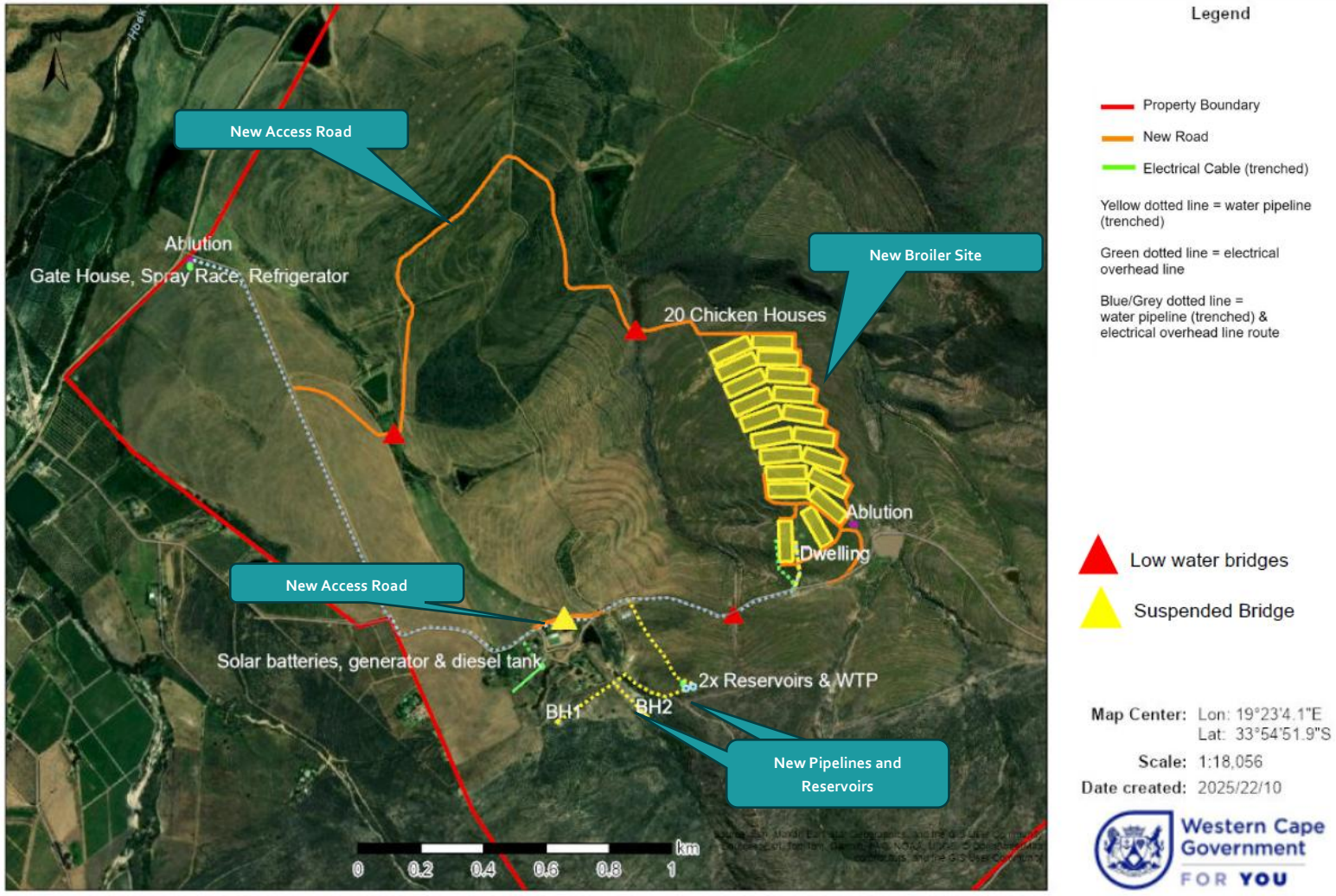


Figure C-2: Proposed activities in relation to the affected freshwater features (Google Earth, 2025).

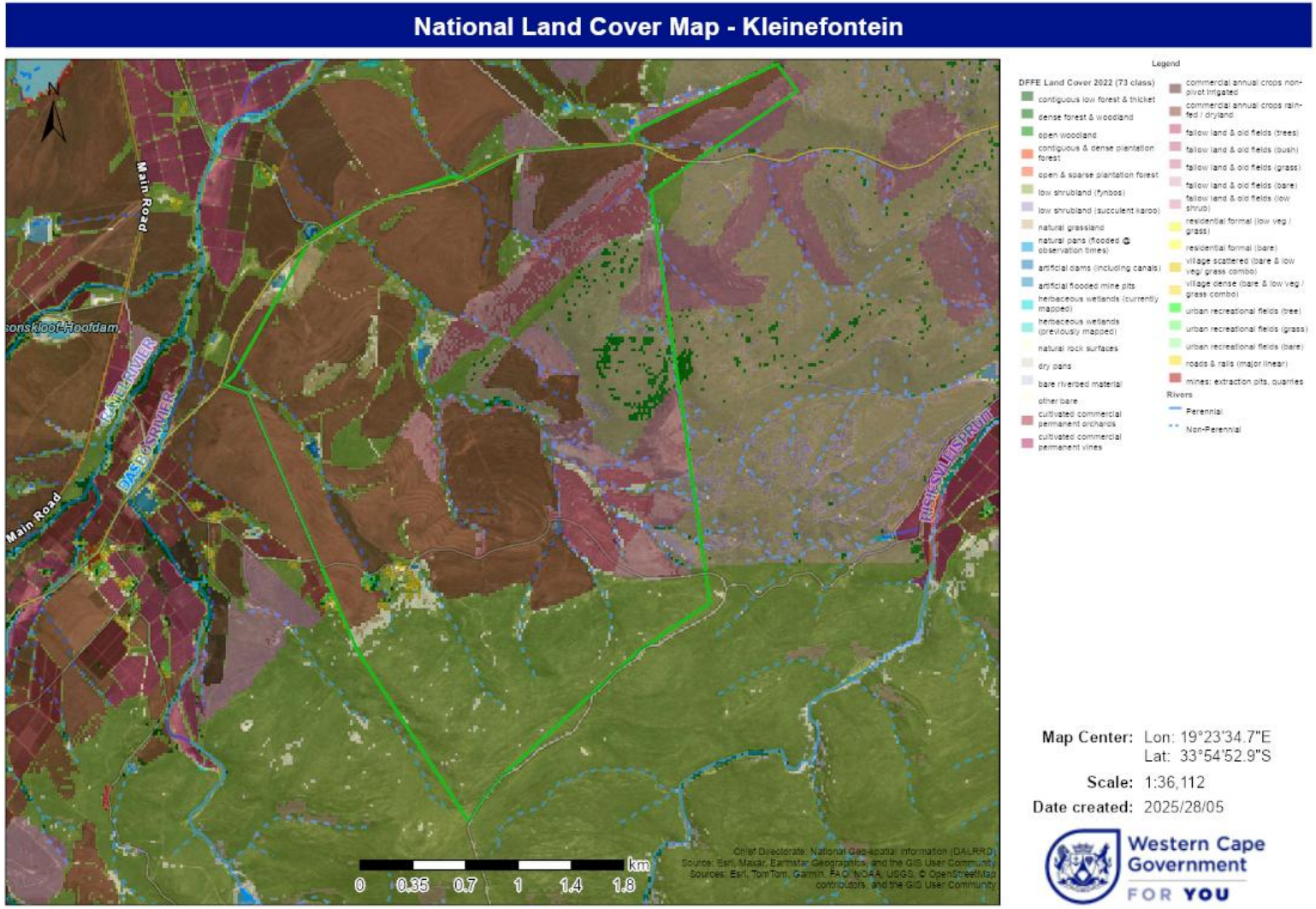


Figure C-3: National land cover map (2014) covering the proposed development area (CFM, 2025)

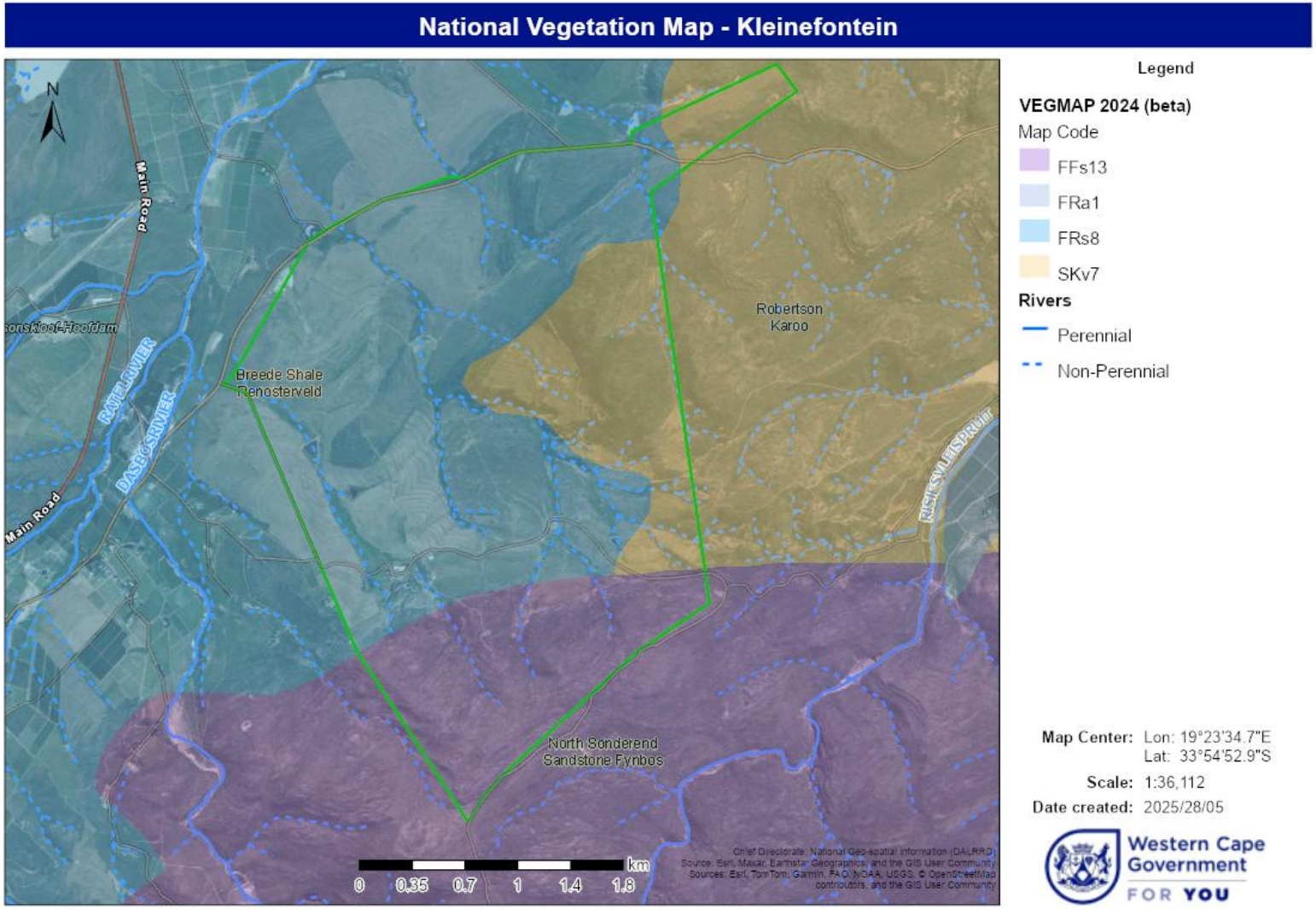


Figure C-4: National vegetation map for the project site (green polygon) (CFM, 2025).

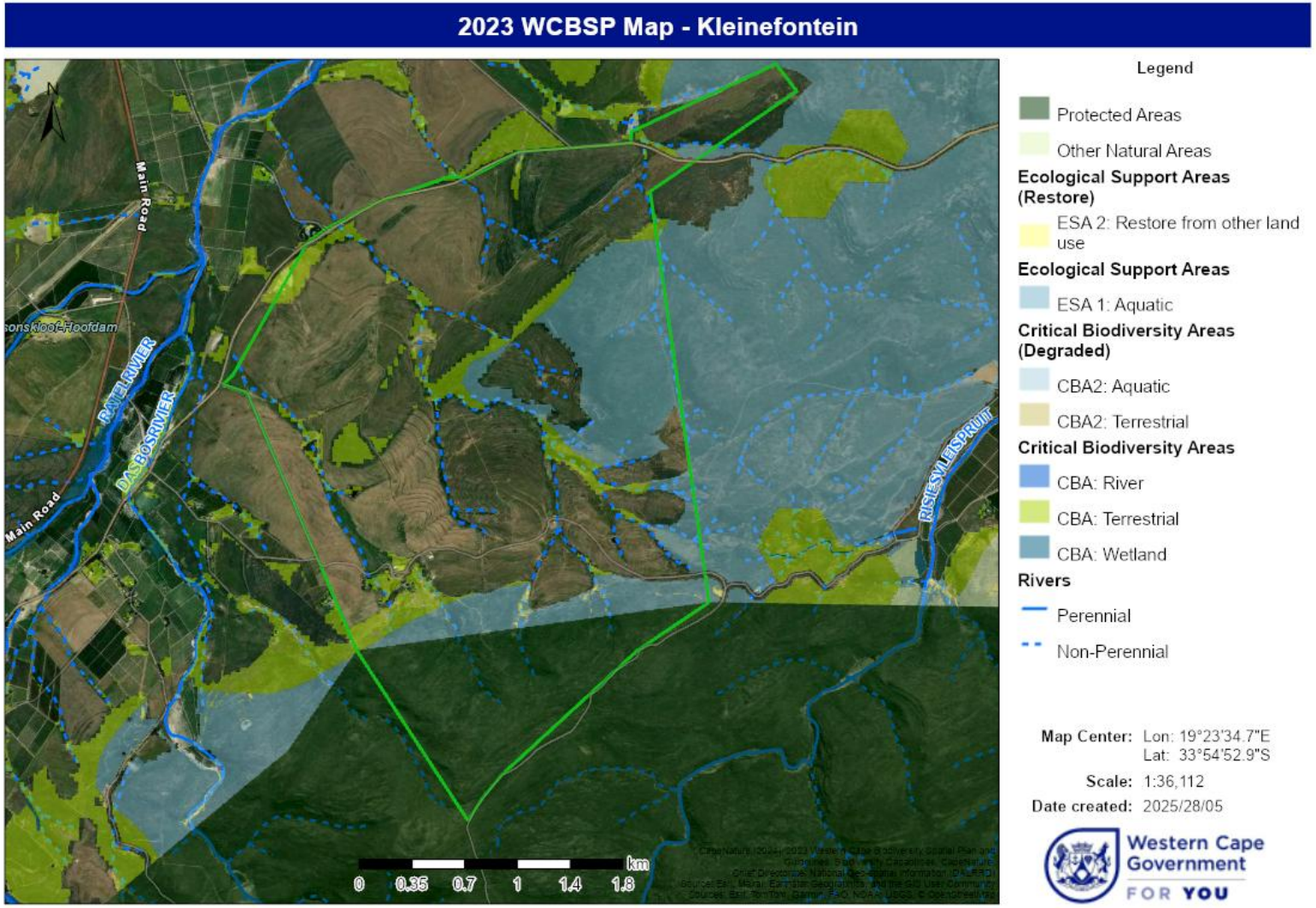


Figure C-5: 2025 Western Cape Biodiversity Spatial Plan for the project site (green polygon) (CFM, 2025).

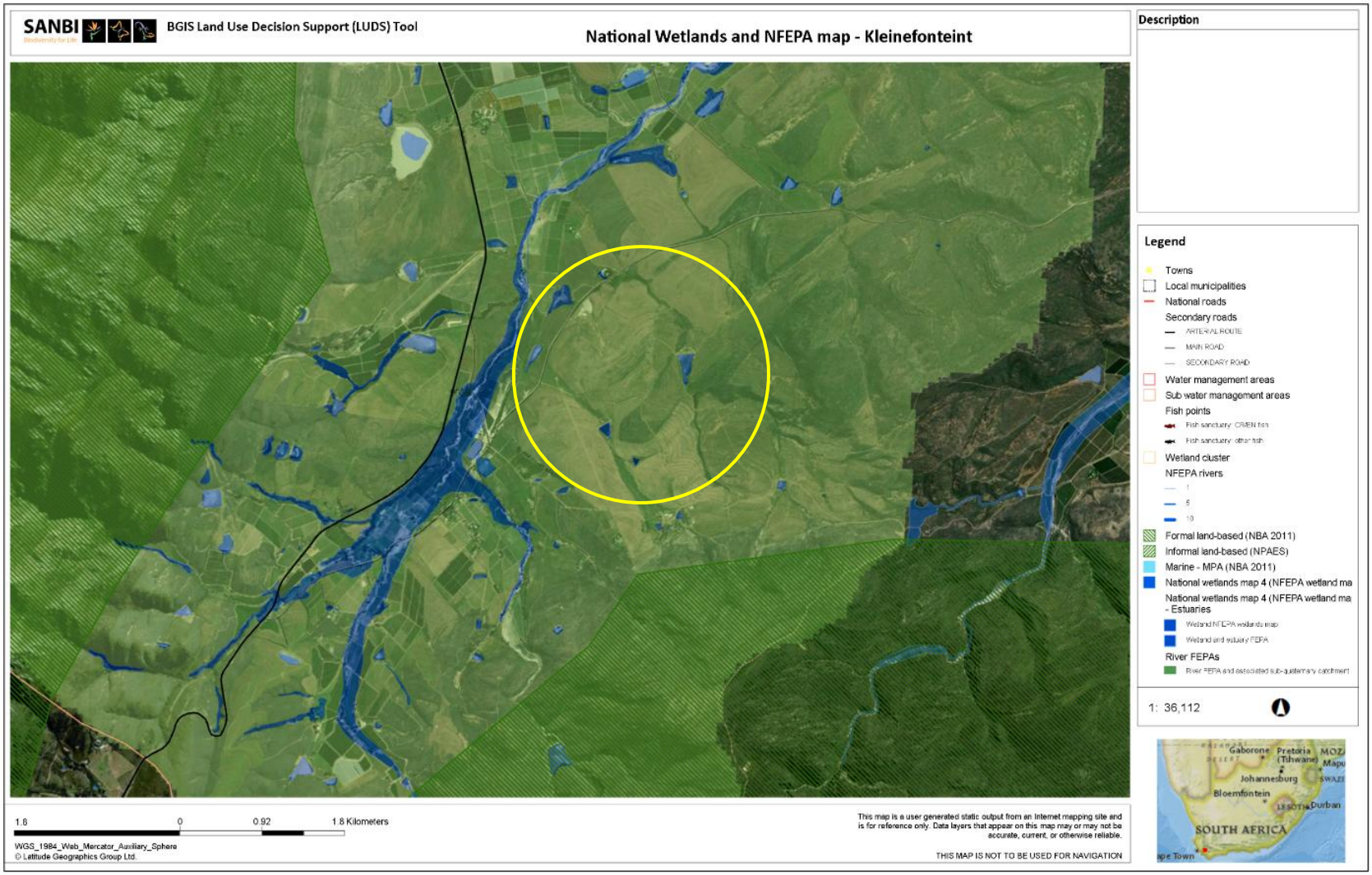


Figure C-6: NFEPA map for the larger area surrounding the Project site (yellow circle)(SANBI GIS, 2025).

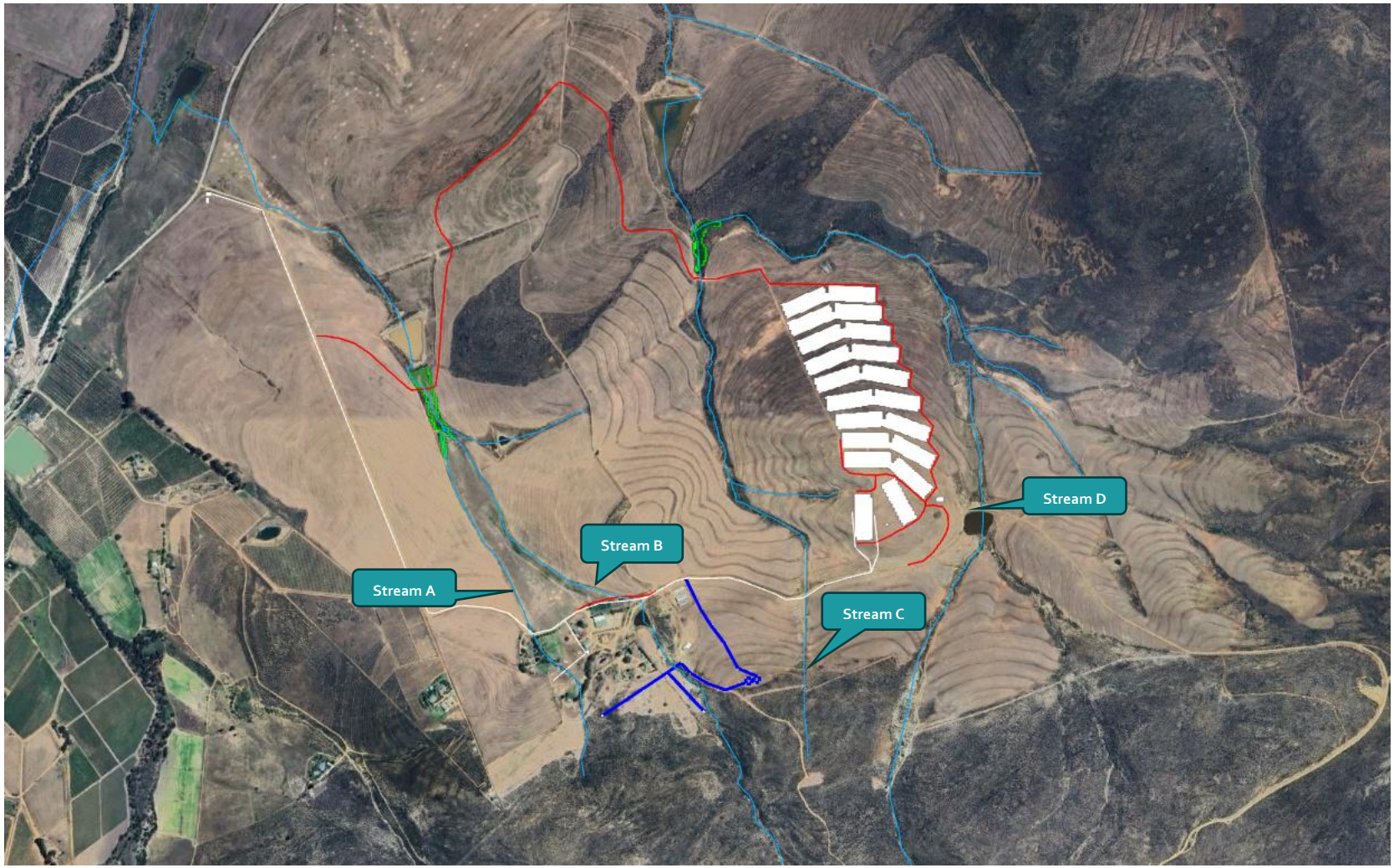


Figure C-7: Satellite imagery indicating the project site with the proposed new roads (red lines), the broiler area (white polygons) as well as the affected streams (blue lines) with their associated wetland areas (green polygons).

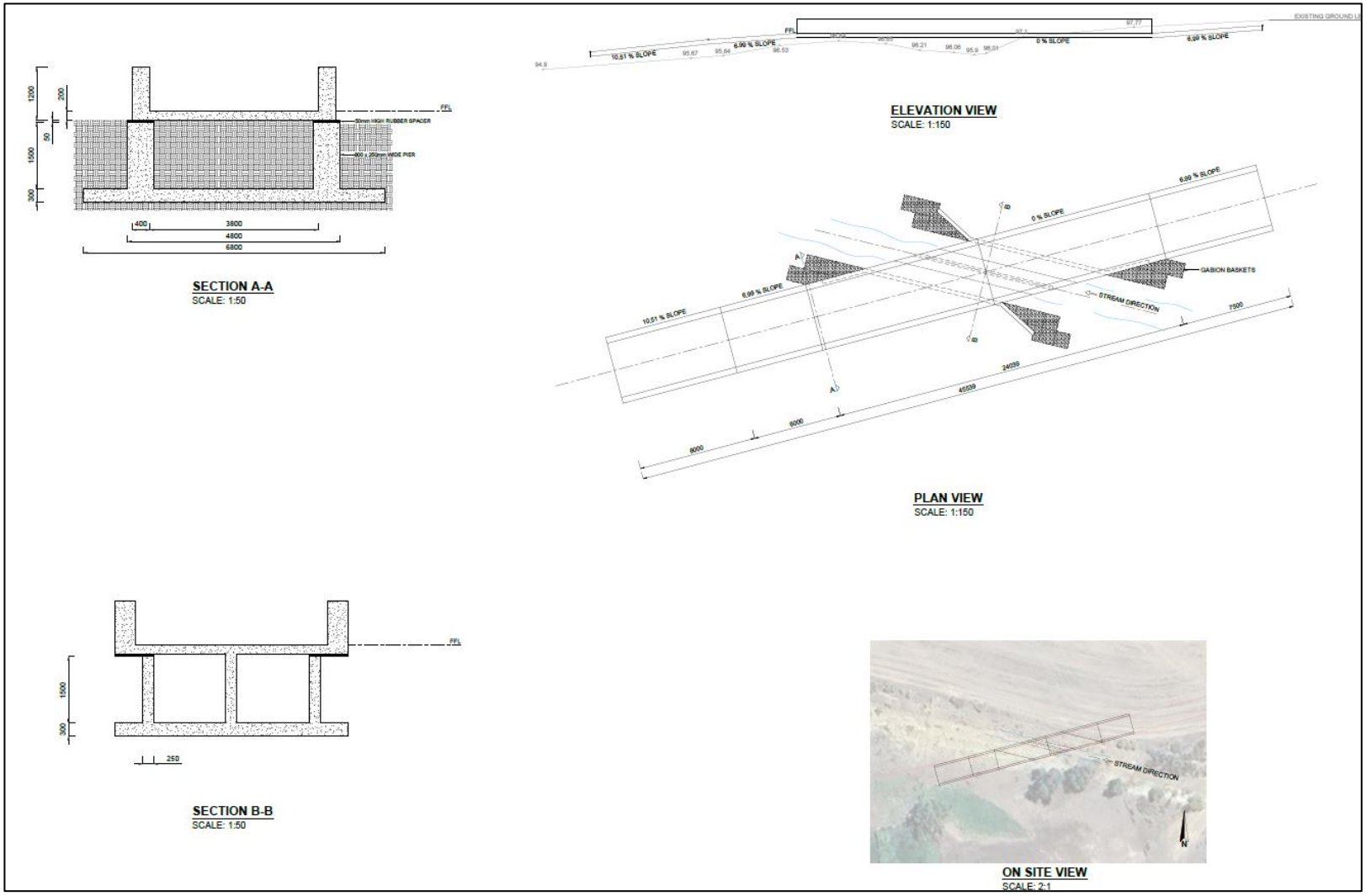


Figure C-8: Engineer drawings for the preferred alternative for the bridge crossing Stream B.

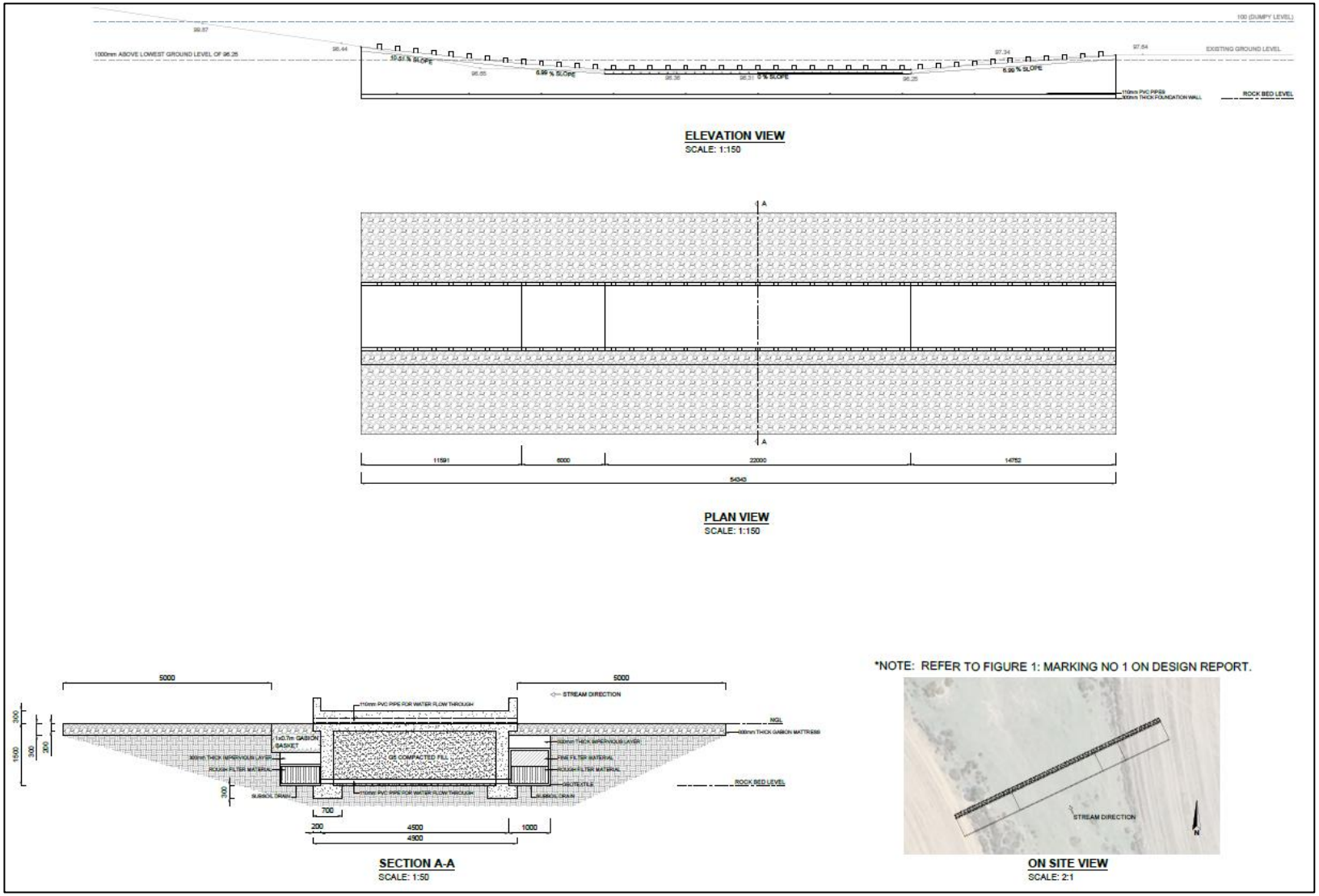


Figure C-9: Engineer drawings for the preferred alternative for the bridge crossing after the confluence of Streams A & B.

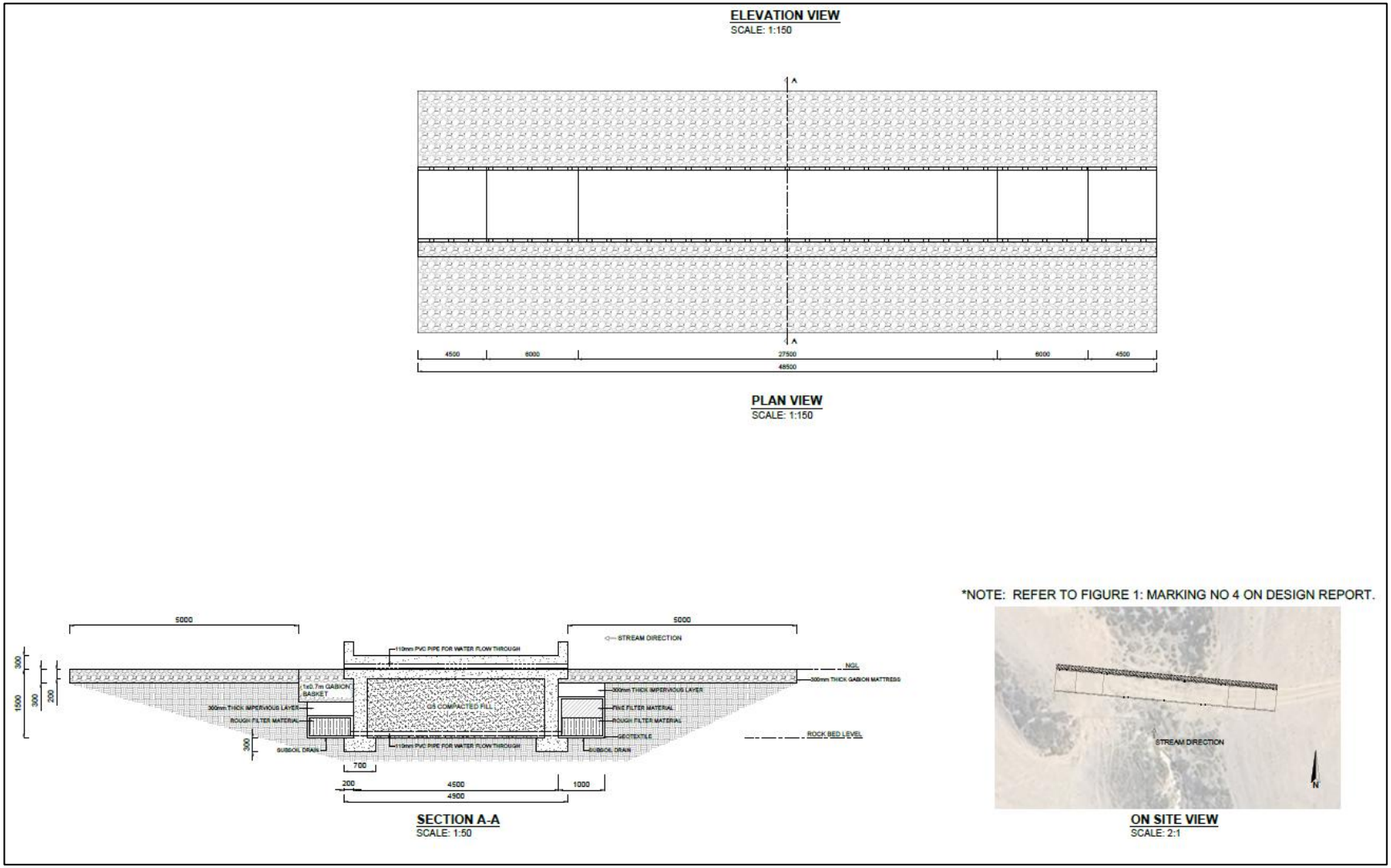


Figure C-10: Engineer drawings for the preferred alternative for the bottom bridge crossing Stream C.

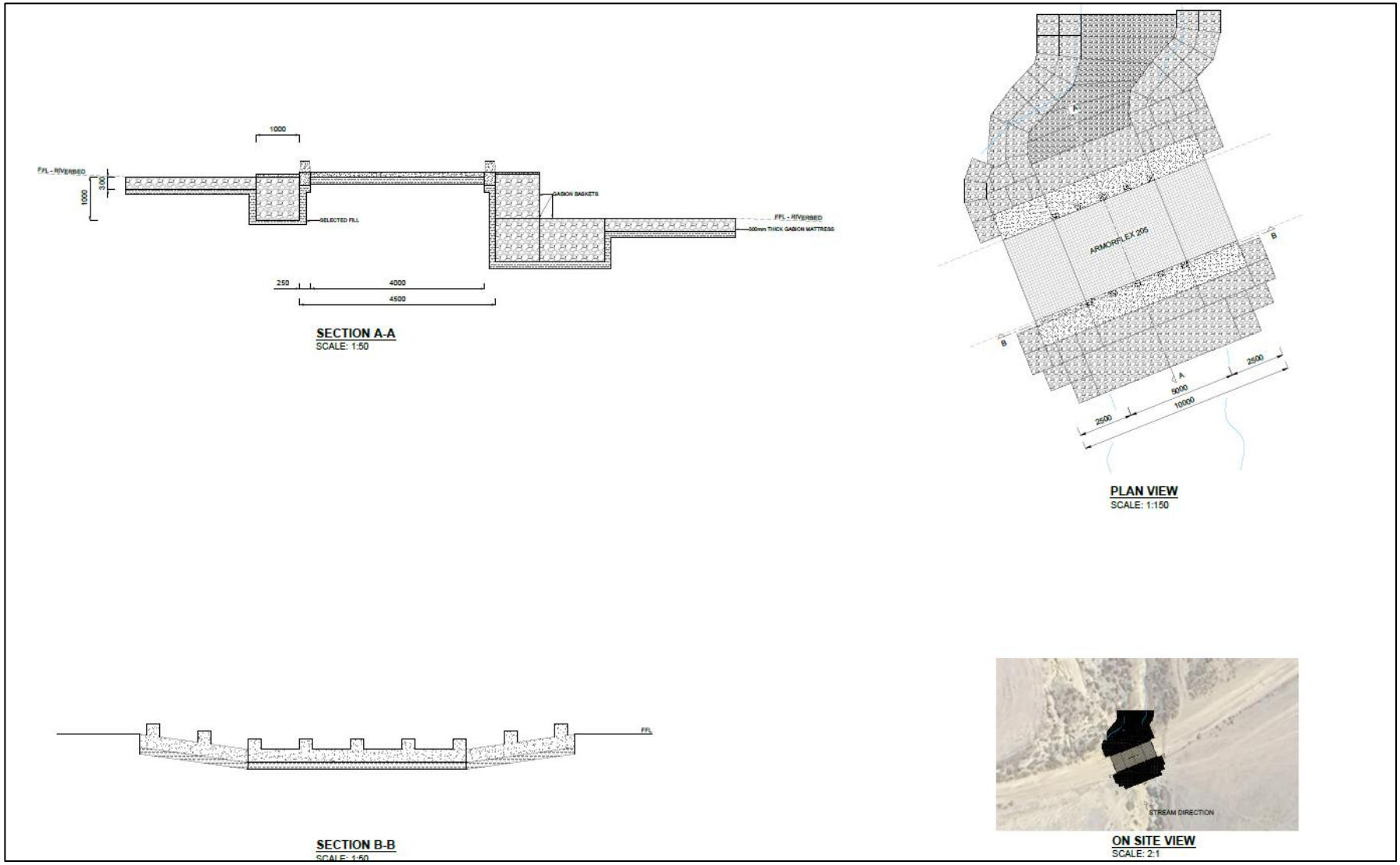
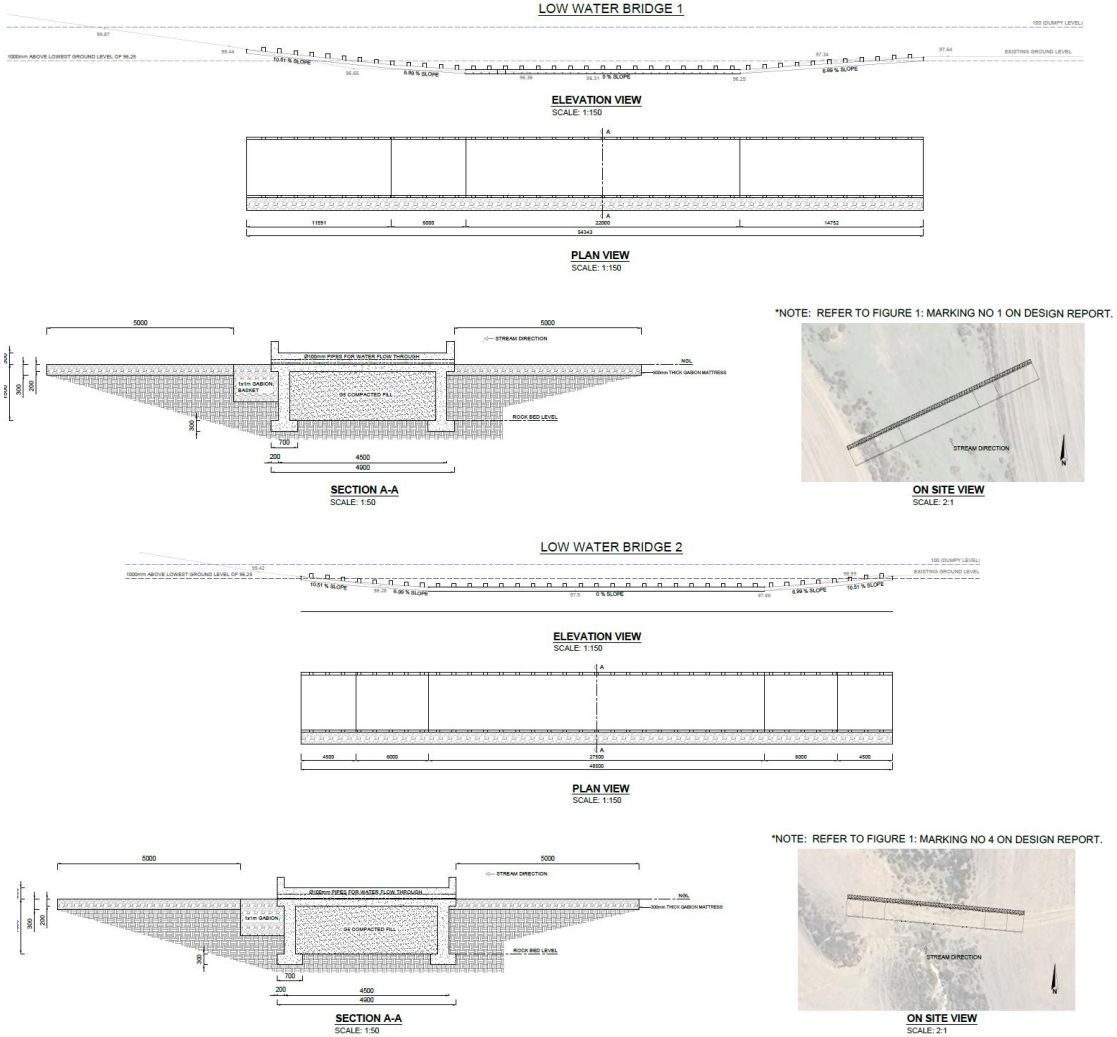
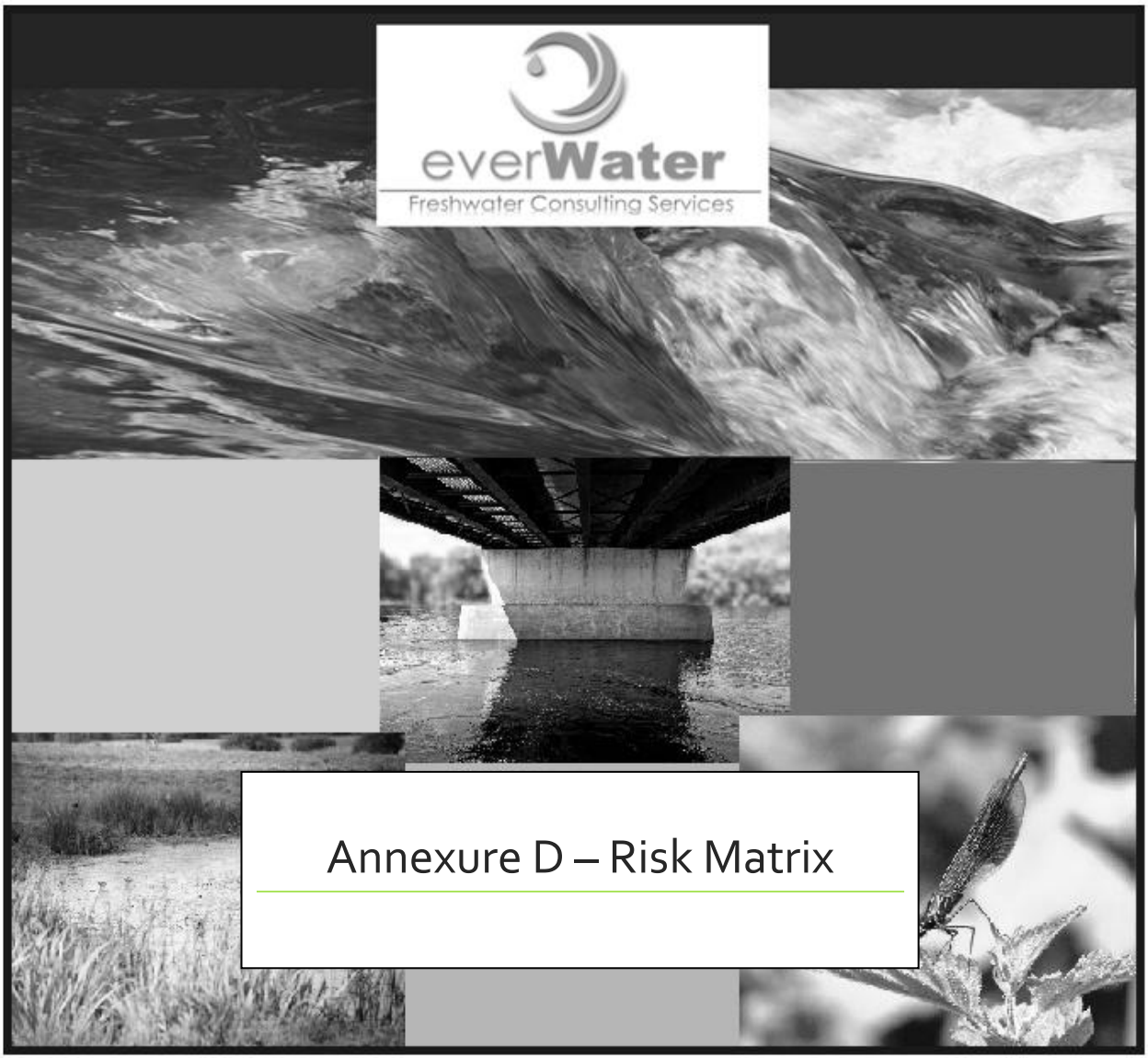


Figure C-11: Engineer drawings for the preferred alternative for the top crossing at Stream C.

Alternative bridge designs for the bridge crossings at the confluence of Streams A & B and the bottom of Stream C, which does not include subsurface drainage:





Annexure D – Risk Matrix

PROJECT: Risk Assessment for the Proposed New Development on Farm numbers 563, 564, 565 and Farm Kleinfontein number 954, Worcester, 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: 05/06/2025

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			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
			Name/s	PES	Overall Watercourse Importance										
CONSTRUCTION (Stream crossings)	<1>Site access	<1a>Slight altering of bed and banks and slight loss of biodiversity	Stream A and B	D/E	Low	2	1	1	4	2	8	20%	1.6	L	High
			Stream C and D	A/B	High	2	1	1	4	4	16	20%	3.2	L	High
	<2>Excavation of soils and vegetation removal associated with site preparation around the construction site.	<2a>Altering the bed and banks, loss of biodiversity and possible siltation and sedimentation, as well as other pollutants towards receiving freshwater features.	Stream A and B	D/E	Low	4	1	1	6	2	12	100%	12	L	High
			Stream C and D	A/B	High	4	1	1	6	4	24	100%	24	L	High
	<3>Construction activities associated with the new road crossings.	<3a>Further altering the bed and banks, loss of biodiversity and possible siltation and sedimentation, as well as other pollutants towards receiving freshwater features.	Stream A and B	D/E	Low	4	1	1	6	2	12	80%	9.6	L	High
			Stream C and D	A/B	High	2	1	1	4	4	16	80%	12.8	L	High
	<4>Construction activities associated with the pipeline crossing.	<4a>Very slight altering the bed and banks and loss of biodiversity.	Stream B	B/C	Low	2	1	1	4	2	8	20%	1.6	L	High
OPERATIONAL (Operation of broiler)	<1>Future operation of the broiler facility	<1a>Risk of water quality impacts on Stream C and D	Stream C and D	A/B	High	2	1	1	4	4	16	80%	12.8	L	High
OPERATIONAL (Future road and dam maintenance)	<1>Future culvert maintenance with clearing of sediment and debris build-up or nuisance vegetation.	<1a>Disturbance of soils and local biodiversity	Stream A and B	D/E	Low	2	1	1	4	2	8	60%	4.8	L	High
			Stream D and E	A/B	High	2	1	1	4	4	16	60%	9.6	L	High

Mitigation Measures:

Construction Phase:

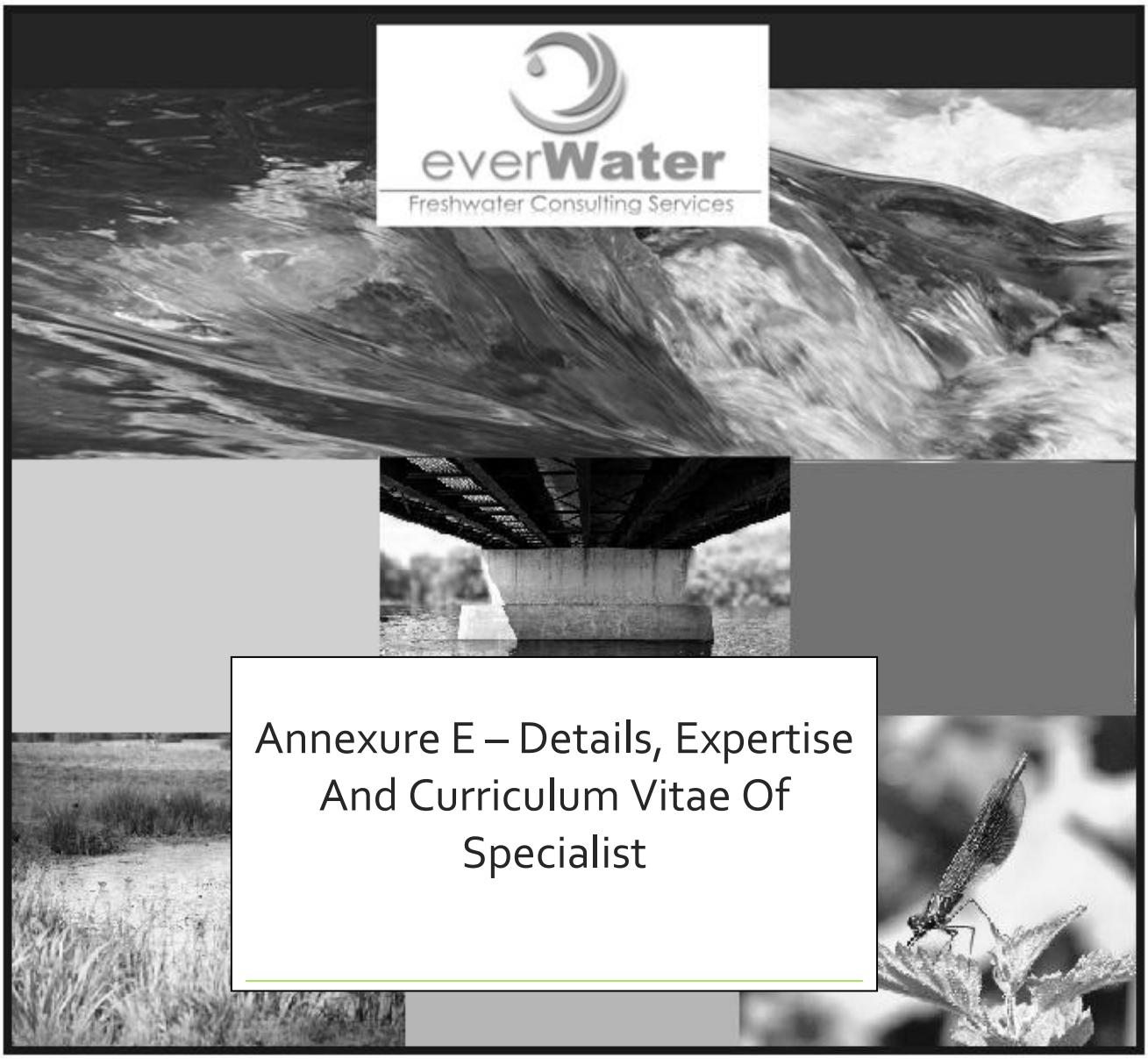
- All road crossing structures must be designed to avoid obstruction of streamflow, including low flows.
- Construction activities directly involving freshwater features (i.e., road and pipeline crossings) should preferably be scheduled during the dry summer months—typically from December to March—when rainfall and runoff are at their lowest.
- If any flow is present within the streams during construction, appropriate measures must be taken to divert the water around the work area and ensure its release downstream.
-

- A buffer zone extending 6 meters upstream and downstream of the construction footprint should be clearly demarcated. No disturbance or activity should occur beyond these designated areas within the stream channel.
- The boundaries of this buffer zone must be physically demarcated using high-visibility fencing or flagging prior to the commencement of any construction activities.
- Work within the stream channels should be limited strictly to essential areas.
- Clearing of riparian or wetland vegetation must be avoided where possible or otherwise kept to a minimum. Where practicable, vegetation should be pruned or topped rather than grubbed or uprooted.
- All wetland/stream areas disturbed during construction must be rehabilitated and revegetated with appropriate indigenous wetland and riparian buffer species once construction is complete
- Special attention should be given to managing water quality impacts in the construction Environmental Management Programme (EMP).
- Temporary silt fencing, sandbags, or berms should be installed within downstream channels to prevent sediment generated during construction from entering downstream freshwater features.
- Implement a phased clearing approach, limiting vegetation clearance to areas required for active construction only.
- Designate stockpile locations at least 50 metres away from any watercourses or wetland areas.
- Prevent contaminated runoff from construction sites from entering adjacent streams or wetlands by using diversion drains and berms. Temporary detention basins or sediment traps should be constructed to capture excess sediment before it reaches wetland or stream areas.
- Good Site Management Practices include:
    - Portable chemical toilets must be provided at all work sites, or ensure that conveniently located site toilets are available. Toilet facilities must not be located within 100 metres of any stream or wetland areas.
    - Maintain and clean toilets regularly to ensure they remain in good working order and hygienic condition.
    - No waste or foreign materials may be dumped into streams or wetlands. These areas must also not be used for cleaning clothing, tools, or equipment.
    - Prevent the discharge of water containing polluting matter or visible suspended solids directly into streams or wetland areas.
    - Immediately clean any accidental oil or fuel spills or leaks. Do not hose or wash spills into the surrounding natural environment.
    - All operations involving the use of cement and concrete (outside of the batching plant) must be carefully controlled.
    - Limit cement and concrete mixing to designated sites wherever possible.
- Low water bridges should be installed at or slightly below the natural streambed level to avoid obstructing low flows and to facilitate the unimpeded movement of aquatic biota.

- As mentioned under "Loss of Biodiversity", should flow be present during construction, temporary diversion structures should be implemented to reroute stream and wetland flow around the active work area, ensuring that low flows remain uninterrupted throughout the construction period.
- As the client proposes to include subsoil drainage in the low-water bridge structures, the following mitigation should be taken into account:
    - Drainage should consist of several pipes or a continuous stone layer.
    - The subsoil drain's cross-sectional area should roughly match or exceed the flow cross-section of the natural subsurface seepage path, both up and downstream of the bridge. This should be at a minimum 0.3–0.5 m depth and width.
    - The subsoil drain must be wrapped in geotextile or similar to keep fine wetland sediments out.
    - Stone size must be uniform and coarse to maintain voids for long-term flow.

Operational Phase:

- All rehabilitated and revegetated areas within the wetland/stream areas should be monitored for the following 2 years, ensuring the establishment of good plant biodiversity.
- Monitoring of all stream crossings for signs of erosion, debris build-up or nuisance growth around the low water bridges, should be included and addressed in a formal Maintenance and Management Plan for the project.
- No use of machinery is allowed within any wetland/stream channels for the operational phase.
- All debris must be removed and properly disposed of.
- No dumping of debris should be allowed in the stream/wetland areas.
- Any wetland/ riparian or instream areas disturbed by Maintenance activities to be rehabilitated and revegetated (if necessary) after maintenance works.



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 2023/2024 projects:

- Snyman, J.C. March 2024. Freshwater Assessment For Alleged Unlawful Activities That Took Place On Portion 16 Of Farm Derde Heuvel 149, Montagu Rd, Western Cape
- Snyman, J.C. March 2024. Freshwater Impact Assessment for the Proposed Maintenance Activities Associated with Main Road 174, Stellenbosch, Western Cape
- Snyman, J.C. May 2024. Freshwater Assessment For The Proposed Expansion Of The Berg River Boulevard, Paarl, Western Cape.
- Snyman, J.C. May 2024. Situation Assessment For The Rehabilitation Of A Section Of A Non-Perennial Watercourse, at Farm Sandfontein 232/5, Swellendam RD.
- Snyman, J.C. July 2024. Freshwater Compliance Statement For The Proposed Extension Of The Quay Link Road, Saldanha Feeport Development, Saldanha, Western Cape
- Snyman, J.C. September 2024. Freshwater Assessment And RMMP For The Proposed Dam Repair Works On Farm 43, Stellenbosch, Western Cape
- Snyman, J.C. September 2024. Freshwater Assessment For The Proposed Upgrading Of The Klapmuts Wastewater Treatment Works (Wwtw), Portion 5 Of Farm 736, Paarl, Western Cape
- Snyman, J.C. September 2024. Freshwater Assessment For The Proposed New Development On Portion 14 Of Farm Slange Rivier 303, Swellendam, Western Cape.
- Snyman, J.C. September 2024. Freshwater Assessment For The Proposed Upgrading Of The Onrus Main Pump Station, On The Remainder Of Erf 2702, Caledon, Western Cape
- Snyman, J.C. October 2024. Freshwater Compliance Statement For The Proposed Works Within The Bok River As Part Of The Extension Of The Blue Bay Lodge Development, Saldanha, Western Cape
- Snyman, J.C. October 2024. Freshwater Monitoring Plan For The Proposed Operation Of The New Korhaanshoogte Dam, Portion 25 Of Farm 433, Clanwilliam
- Snyman, J.C. November 2024. Audit Report For The Rehabilitation Of A Section Of A Non-Perennial Watercourse, At Farm Sandfontein 232/5, Swellendam Rd
- Snyman, J.C. February 2025. Freshwater Assessment For The Proposed New Proposed Casa Maris Residential Development, Somerset West, Western Cape
- 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