



FRESHWATER ASSESSMENT FOR THE PROPOSED
DEVELOPMENT ON PORTION 39 OF THE FARM RIETVALLEI
115, ROBERTSON, WESTERN CAPE WESTERN CAPE
OCTOBER 2021

(Updated October 2023)

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EXECUTIVE SUMMERY

The applicant plans to develop +/- 30 hectares of vineyard infrastructure on Portion 39 of the farm Rietvallei Number 115 near Robertson in the Western Cape. An initial freshwater report was commissioned as part of the EIA Process in October 2021 and further updated in September/October 2023, to determine the impact of above activity. The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed development site as well as impacts that the development might have on the surrounding freshwater ecosystem.

The study area lies approximately 10 km directly east of Robertson and can be reached via the R60 towards Ashton, Western Cape. The area is located within Quaternary catchment H4oL, which falls within the Breede/Gouritz WMA.

Freshwater features found on site include Stream A with its associated tributaries as well as several other drainage lines located towards the west of the development area. Stream A originates on the foothill slopes of the Langeberg Mountain to the north, flowing southwards through the property and further downstream towards the Breede River. The stream would have historically flowed all the way to the Breede River, but is currently caught in a large dam just after passing under the R60 and is further downstream completely channeled in an artificial channel towards the river. From the field assessment, the drainage lines were found to be purely that, watercourses only channeling water for a short time during heavy rain spells, and was thus not included in the detail assessments, but addressed in the impact assessment and recommendations.

From a vegetation and biodiversity point of view, all freshwater features on site, presents high ecological function and is associated with the Robertson Karoo vegetation type. From the 2017 Western Cape Biodiversity Spatial Plan most of the stream is classified as an Ecological Support Area (ESA1 and 2 - Watercourse, Water Source). These areas are not essential for meeting biodiversity targets but play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. These areas should be maintained in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised. From the NFEPA map, the larger catchment in which the area falls, does not lie within a FEPA, with only the existing farm dams indicated as FEPA wetlands.

The IHI assessment compared with the site observations in that the riparian and instream integrity of the stream was found to be in a Natural (riparian) to Largely Natural (instream) state throughout the property. The EIS for the quaternary catchment area H4oL is 2,3 (High), which is slightly higher than that found for Stream A (Moderate), and could be attributed to Stream A's ephemeral nature, and thus being less sensitive to especially flow modifications. From the field assessment, all drainage lines were also found to still be in a natural state. The REC for freshwater features found on site would be recommended to be managed in a B class. Considering buffer zones, a 20m buffer zone from the edge of the riparian zone for

the main stream (Stream A), and a 15m buffer applying to the tributaries and other drainage lines is proposed.

With the latest layout plan, incorporating the proposed buffer zones, the impact of the surrounding area could pose the following impacts:

- Loss of biodiversity;
 - **Low negative impact of Local scale** without the implementation of mitigation measures.
 - **Very Low negative impact of Local scale** with mitigation measures in place.
- Water quality impacts.
 - **Medium-low long-term negative impact of local scale** on the freshwater features without any mitigation measures in place.
 - **Long-term Low to Very Low negative impact of local scale.**

Mitigation measures proposed to minimize the impact of the proposed development are as follows:

Construction phase:

- As stated during the pre-planning phase, in general, development over the named watercourses on site is not supported from a freshwater perspective;
- No new roads are to be constructed over the streams, with only existing roads to be used;
- It is proposed that a 15m buffer (from the drainage lines and tributaries) and 20m buffer (from Stream A), be kept during all clearing and development activities;
- During construction activities, all stream sections beyond the buffer zones should strictly be treated as a No-Go area;
- Clearing and planting should preferably take place during the drier summer months, when flow down the slopes will be at its lowest;
- Erosion berms, silt traps, etc. must be in place for all areas where vegetation removal or excavation activities occur to ensure excess sedimentation does not enter the adjacent stream areas;
- Construction materials must be stored at least 30m away from the adjacent stream areas and have suitable retention and bunding structures in place to prevent spills or run-off entering the streams.
- The following good site management should be practiced during the development phase:
 - Portable chemical toilets should be installed at all Work Sites or ensure that conveniently located site toilets are available, and these toilet sites may not be located within a horizontal distance of 100m of the identified stream areas.
 - Do not locate any reservoir, dam or depot for any substance which causes or is likely to cause pollution within the 1:100 year flood line, or within a horizontal distance of 100m of the identified stream areas.

- Do not dump waste of any nature, or any foreign material into the streams, nor are these areas to be used for cleaning of clothing, tools or equipment.
 - Carefully control all on-site operations that involve the use of cement and concrete (this applies to areas other than the batching plant).
- All contaminated runoff from the construction site should be prevented from directly entering the freshwater features.

Operational phase:

- All future development should fall outside of a 15m buffer zone (from the drainage lines and tributaries) and 20m buffer zone (from Stream A).
- Should any stormwater/drainage channels be established within the cultivation areas, such channels should be properly vegetated, preferably with indigenous vegetation such as Kweek grass (*Cynodon dactylon*), which should stabilise the banks and would create opportunity for other surrounding indigenous vegetation to establish and lower the risk of erosion.
- It is proposed that good floor management practices are followed, such as seasonal cover crops in between orchard/vineyard rows, or by mulching the ground, in order to minimize erosion.

CONCLUSION

Due to the largely natural state, high ecological function and moderate EIS of the streams, loss of freshwater features on site due to clearing and planting of agricultural land, in general, is not supported. With the newest layout plan, incorporating the proposed buffer zones, together with other suggested mitigation measures, much of the negative impact is alleviated and the proposed development is deemed to have a **cumulatively low negative impact on the directly affected freshwater features, and a negligible impact on the larger freshwater system (including the Breede River)**. As these streams are defined as a watercourse, any listed activities that are to take place within 32 meters thereof will require authorization in terms of the relevant regulations of NEMA. In addition, the 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 be required for the proposed.

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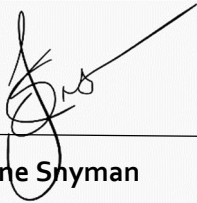
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DECLARATION OF INDEPENDENCE

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

- I am subcontracted as specialist consultant by Green360 (Pty) Ltd, for input in the EIA for the proposed development on Part of Portion 39 of the farm Rietvallei Number 115 near Robertson in the Western Cape.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.



Jeanne Snyman

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Glossary of Terms

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

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

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

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

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

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

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

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

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

Marginal Plants and habitat on the edge of waterbodies

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

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

Reach/ section A portion / stretch of a river

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

Abbreviations

BGCMA – Breede-Gouritz Catchment Management Agency

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

WCBSP – Western Cape Biodiversity Spatial Plan

WMA – Water Management Area

Introduction

The applicant plans to develop +/- 30 hectares of vineyard infrastructure on Portion 39 of the farm Rietvallei Number 115 near Robertson in the Western Cape. An initial freshwater report was commissioned as part of the EIA Process in October 2021 and further updated in September/October 2023, to determine the impact of above activity. The aim of this report is to describe the previous and present ecological state of the freshwater features surrounding the proposed development site as well as impacts that the development might have on the surrounding freshwater ecosystem.

Assumptions and limitations

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 utilized to undertake this study:

- Analysis of the freshwater ecosystems was undertaken at a rapid level and did not involve detailed habitat and biota assessments (Ecosystem level III);
- The WET-health assessment was carried out using South African Department of Water and Sanitation developed methodologies. These assessments were carried out to provide information on the ecological condition and ecological importance and sensitivity of the river systems impacted.
- 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/soils found on the study was done.

Background

Site location, regional and project description

The study area lies approximately 10 km directly east of Robertson and can be reached via the R60 towards Ashton, Western Cape. The area is located within Quaternary catchment H4oL, which falls within the Breede/Gouritz WMA. The general landscape around the site is characterised by rolling hills and a few small unnamed tributaries, and the large Langeberg mountains lying to the far north.

The project would entail the clearance and planting of **+/- 30ha** on Portion 39 of the farm Rietvallei Number 115, Robertson.

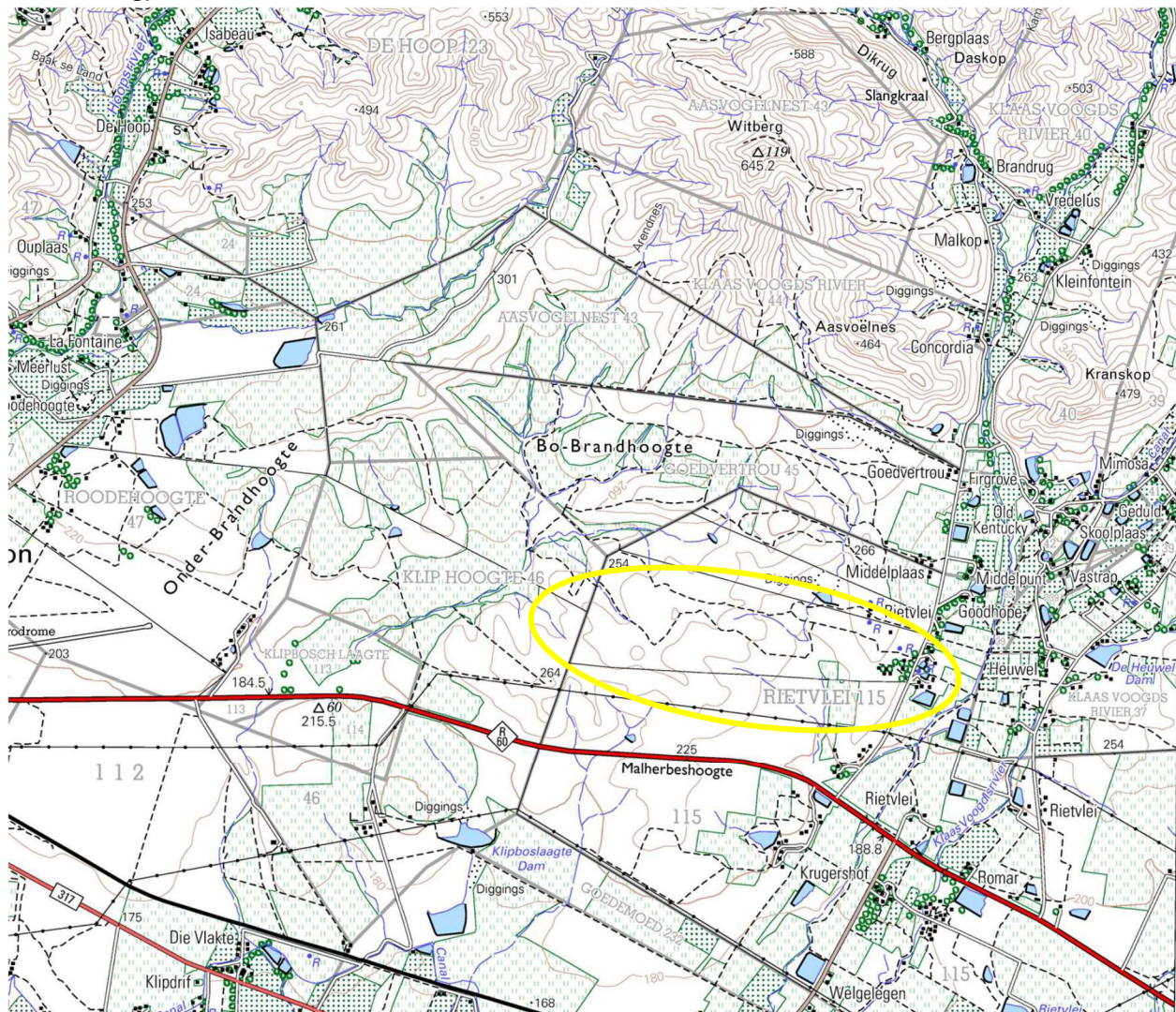


Figure 1: 1:50 000 Topographical map of the area with the location of the proposed development (3319 DD)

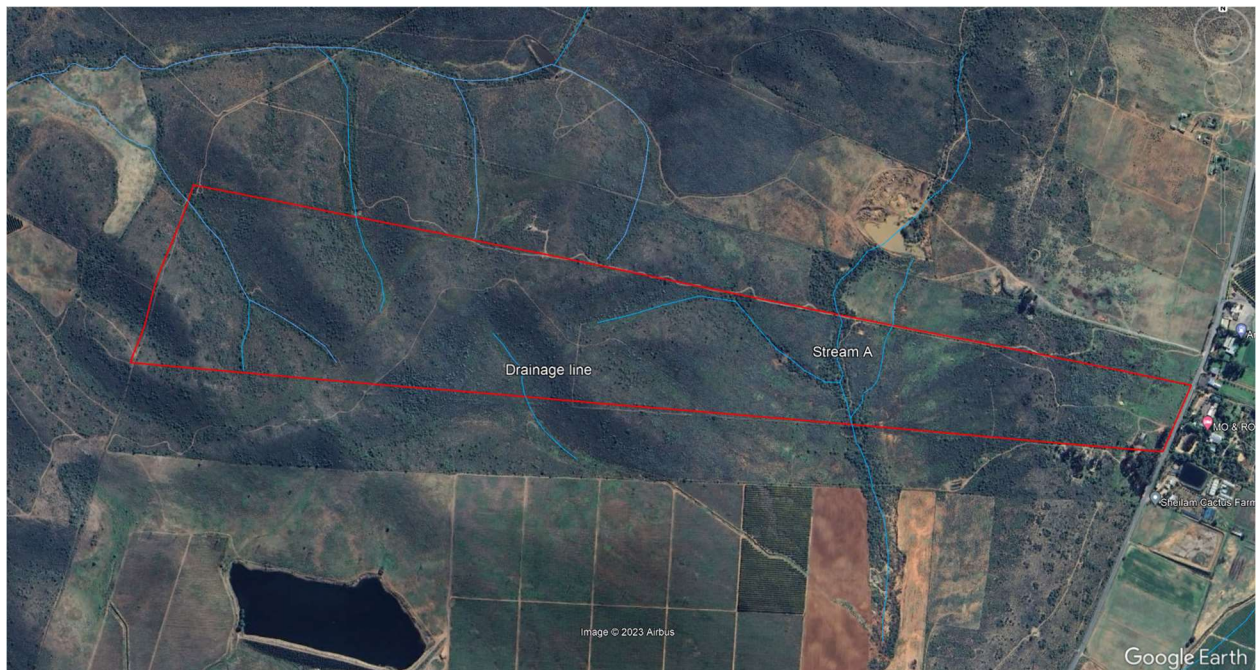


Figure 2: Satellite imagery showing Portion 39 of the farm Rietvallei 115, together with the small tributaries crossing the property. (Google earth, 2023)

Historical and current land use

Surrounding land use consists of a mix of natural undisturbed and agricultural land. The property itself is currently still in a largely natural state, with original untransformed vegetation. From the national land cover map (Figure 3) the areas specifically affected by the proposed development, is classified as a mix of Thicket /Dense bush (dark green) and Shrubland fynbos (light green).

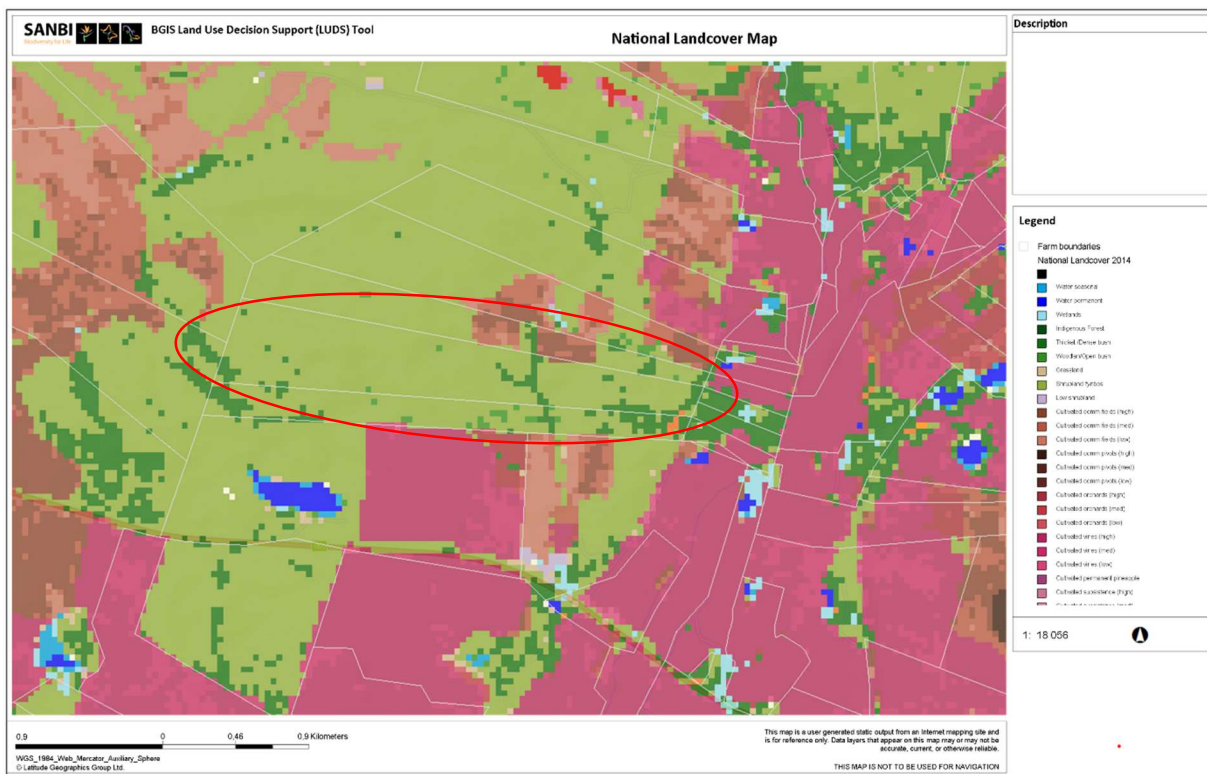


Figure 3: National land cover map for the area with the project site (red circle) (SANBI GIS, 2021)

Google Earth's Timeline function was used as reference imagery (accessed September 2023) for historical land use as well as identification of any wet areas. Google Earth imagery from February 2003 is the earliest available footage covering the area and was used together with a comparison from July 2006 and January 2012 to look at historical land use and whether the site was extensively altered in the past or to detect large changes in the land use of the catchment.

When looking at these images, the land use around the site has for all these years remained the same (mostly natural), with no visible changes over these years. Apart from the unnamed tributaries found on the property, no other wet areas were identified from satellite imagery.

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Figure 4: Google Earth imagery from 2003 (top), 2012 (middle) and 2023 (bottom) (Google earth, 2023).

Climatic conditions of the site

Robertson's climate was used as reference for that found on site and can be classified as warm and temperate. The area normally receives about 255mm of rain per year and because it receives most of its rainfall during winter it has a Mediterranean climate. The chart below shows the average rainfall values for Robertson per month. It receives the lowest rainfall (18mm) in February and the highest (137mm) in July. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Robertson range from 17°C in June/July to 29°C in February. The region is the coldest during July when the mercury drops to 3°C on average during the night.

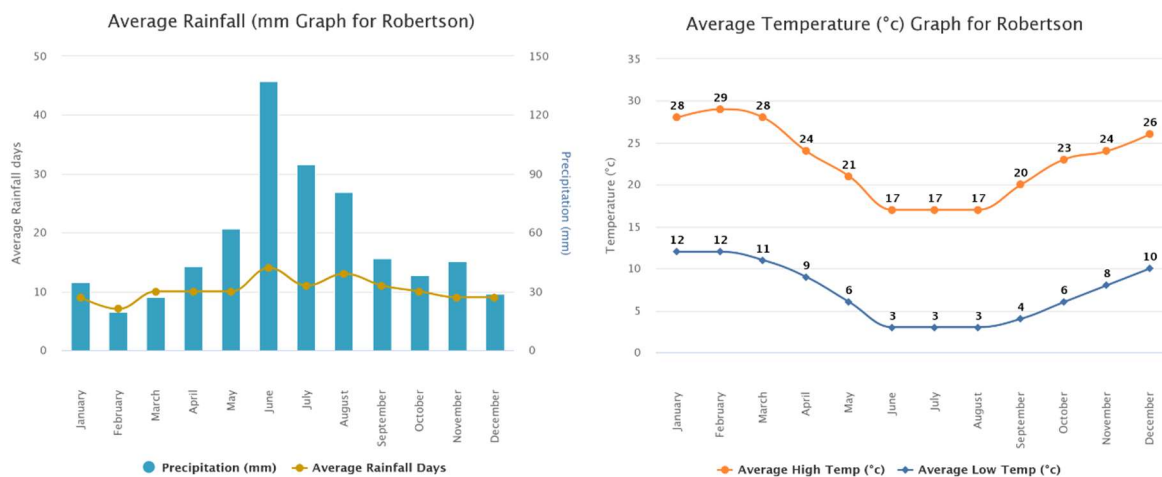


Figure 5: Climate graphs for the Robertson area (World weather online, 2021)

Vegetation and Fauna

The mapped natural vegetation type for the largest part of the property can broadly be classified as the Least Threatened Robertson Karoo (SKv 7 - Yellow area in Figure 6) with a small patch of the Threatened Breede alluvium fynbos (Fra1 – Blue area in Figure 6). Robertson Karoo is generally situated in the broad valley of the middle reaches of the Breede River around Worcester, Robertson and Ashton. Vegetation and Landscape Features generally include undulating flats and adjacent hills (sometimes with very steep flanks) supporting dwarf succulent shrubland to succulent thicket of medium height dominated by succulent species of *Euphorbia*, *Crassula* (and related genera) and vygies (*Drosanthemum* and *Ruschia* the major structural players). *Euphorbia mauritanica* (var. *corallo-thamnus*) is usually dominant on *euweltjies*, which are an important element of the landscape and vegetation of the Robertson Karoo (Mucina & Rutherford 2006).

Looking specifically at the freshwater features on site, Stream A has a very clear riparian zone, but due to its ephemeral nature, only supports terrestrial vegetation with no aquatic vegetation found along the

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reach crossing the property or within its tributaries. Indigenous vegetation found along the riparian zone include mostly Sweet thorn (*Vachellia karroo*), *Euphorbia burmannii* or *Euphorbia mauritanica*, Wolwedoring (*Lycium oxycarpum*), Several *Ruschia* species (*R. caroli* and *R. cymose*), Sjambokbos (*Senecio junceus*), Gewone ghwarrie (*Euclea undulata*) and Renosterbos (*Elytropappus rhinocerotis*). The Geophytic herbs *Moraea Viscaria*, *Moraea gawleri* and *Pelargonium violiflorum* was also found on site.

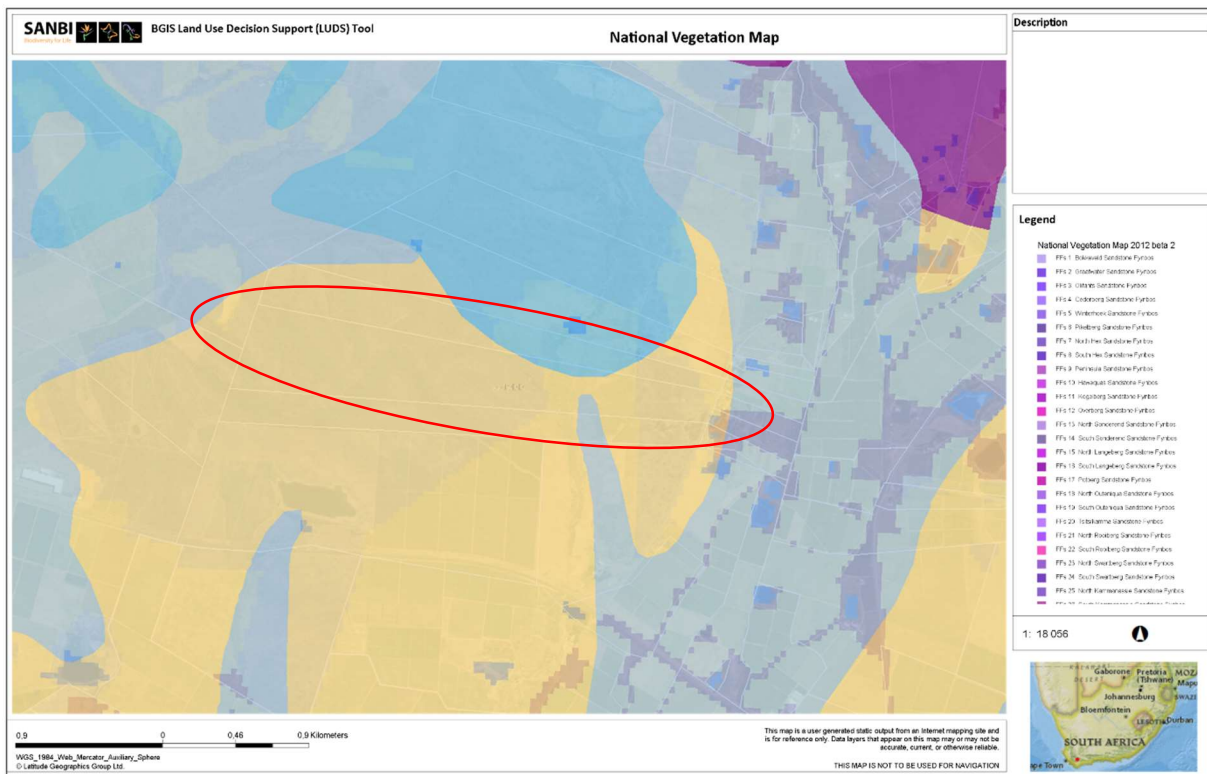


Figure 6: National vegetation map for the area (SANBI GIS, 2021)



Figure 7: Distinct riparian vegetation around Stream A and its tributaries clearly visible.



Figure 8: Vegetation typically around the riparian zone



Figure 7: Vegetation typically around the drainage lines.

Conservation Value

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) and the National Freshwater Ecosystem Priority Areas Map provides information regarding the conservation value and ecological importance of the freshwater features studied.

2017 Western Cape Biodiversity Spatial Plan (WCBSP)

From the 2017 Western Cape Biodiversity Spatial Plan (Figure 10) Stream A is classified as an Aquatic ecological support area (ESA1 – Blue areas). These areas are not essential for meeting biodiversity targets, but play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. These areas should be maintained in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised. The central channel running through the stream (Yellow line) is also marked as an Ecological Support Area 2 (Watercourse - ESA2: Restore from other land use).

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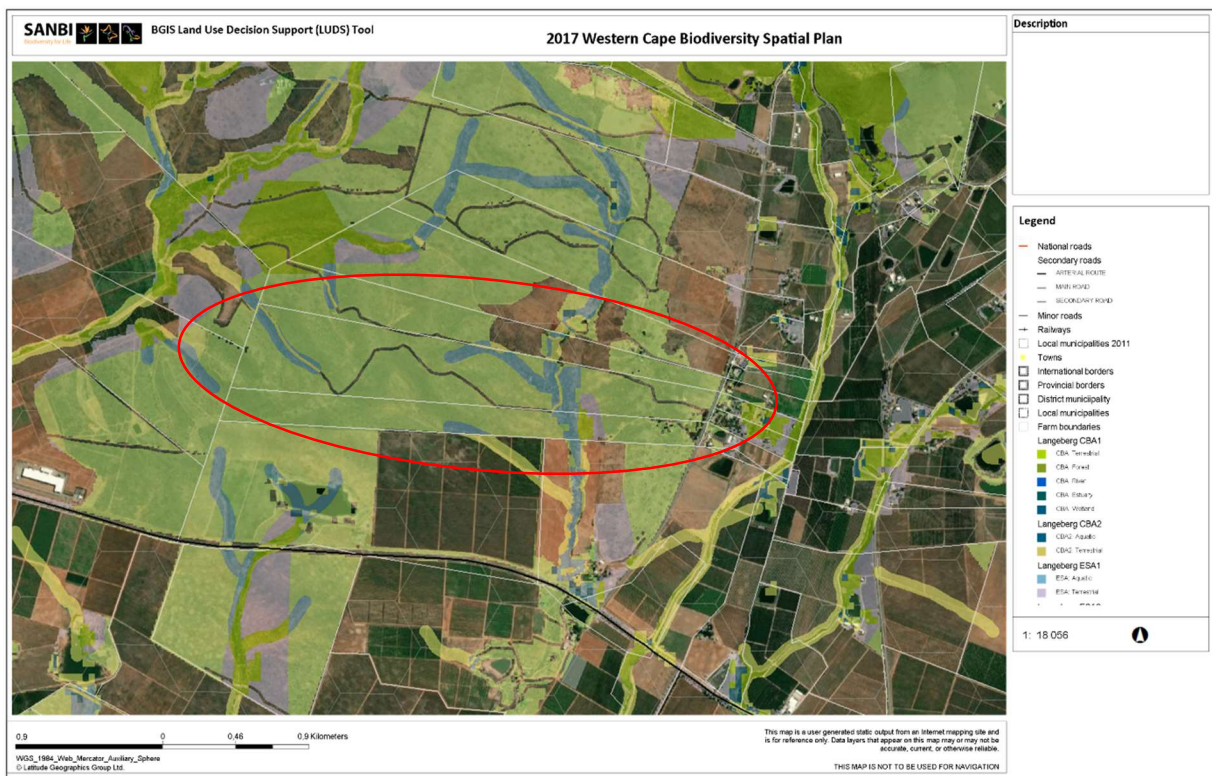


Figure 10: The 2017 Western Cape Biodiversity Spatial Plan (WCBSBP) map (SANBI GIS, 2021)

NFEPA map

FEPA's are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources. From the NFEPA map (Figure 11), the larger catchment in which the area falls, does not lie within a FEPA, with only the existing farm dams on adjacent properties indicated as FEPA wetlands.

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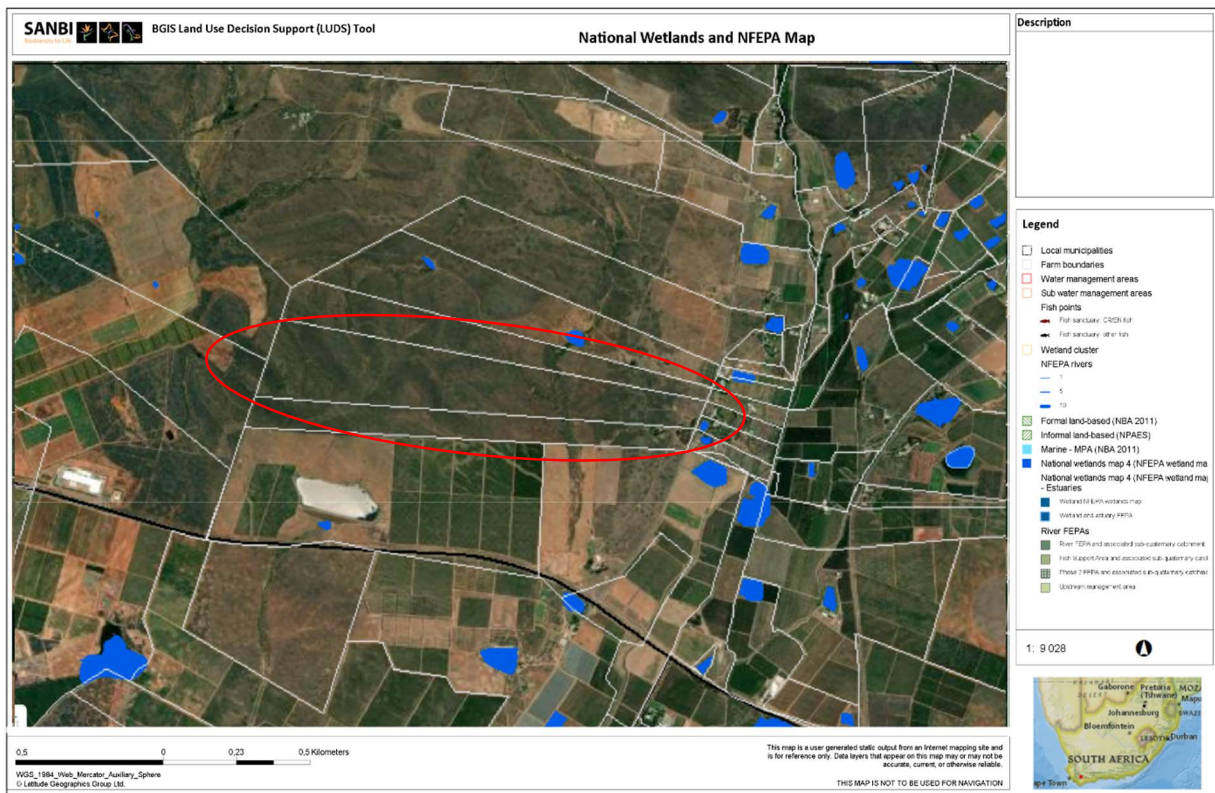


Figure 11: NFEPA map for the area (SANBI GIS, 2023)

Aquatic assessment

Classification of Aquatic Systems

The ecosystem and vegetation of the study area was assessed in its present, as well as its likely pre-expanded and historical composition. It is described in context of the freshwater systems of the area as assessed at the end of the wet season with the site visit done on 29 September 2021. Freshwater features found on site included an Unnamed ephemeral stream and its tributaries (hereafter referred to as Stream A), together with several smaller drainage lines located further west on the property. As the drainage lines primarily serve as temporary watercourses, channelling water only for a short period of time, during heavy rain spells, they haven't been included in the detailed assessment phase. However, these will be addressed in the impact assessment and recommendations. To get a good representation of the present ecological state of the freshwater features, a formal Habitat Integrity, PES and EIS (Ecostatus level III) were conducted for Stream A and its small tributaries.

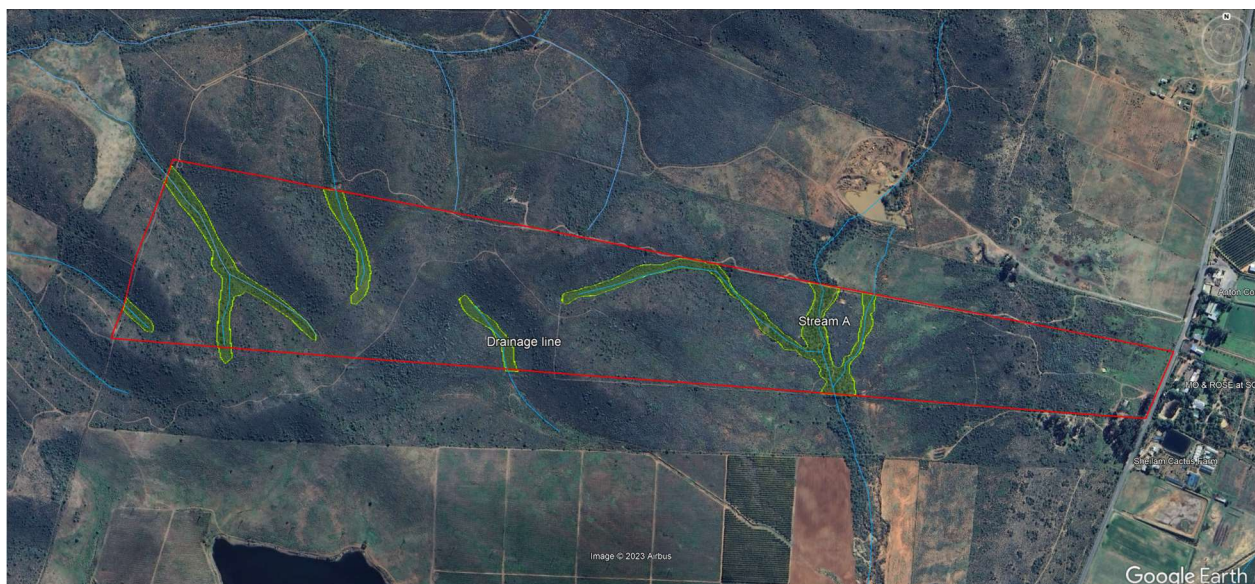


Figure 12: A marked satellite image indicating the property boundary area (red polygon), Stream A together with its tributaries and the drainage lines (Blue lines) with their riparian zones (green polygons).

Stream A originates at the feet of the Langeberg Mountains located to the north, flowing in a general southern direction towards the Breede River. The stream would have historically flowed all the way to the Breede River, but is currently caught in a large dam just after passing under the R60 and is further downstream completely channeled in an artificial channel towards the river. This small ephemeral stream was found to be dry during the field visit, and is presumed to only flow directly after rainfall has occurred in the area. It was also found to be in a near natural state over most of the reach falling within the property

boundary, with a large dam located just upstream of the northern farm boundary and a small dam located just before the stream leaves the property on the southern boundary. Although the large upstream dam would definitely have altered the flow regime, looking at its upstream qualities, it does not seem as if it has changed the nature of the stream (for example from seasonal to ephemeral), and but would have altered the flood patterns of the stream.

Geomorphological and Physical description

TABLE 1. GEOMORPHOLOGICAL AND PHYSICAL FEATURES OF STREAM A

	Stream A
Geomorphological Zone	Foothill – Sand bed
Valley form	Pediment
Lateral mobility	Moderately confined
Hydrological type	Ephemeral
River Size	<5m
Ecoregion	Southern Folded Mountains Ecoregion
DWA catchment	H4oL
Vegetation type	Robertson Karoo
Rainfall region	Mediterranean

Ecological Assessment

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 are 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 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 degradation of a river. The river type context is also taken into account in order to consider the weight of abovementioned metrics on both the instream and riparian zone and includes the flow regime, geomorphic zone as well as size of the river assessed.

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The result of 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 2. HABITAT INTEGRITY 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.

This assessment was done for Stream A (including its tributaries).

IHI ASSESSMENT AND RESULTS:

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

RIPARIAN ZONE HABITAT INTEGRITY	Stream A
Vegetation Removal (Impact 1 - 25)	2
Exotic Vegetation (Impact 1 - 25)	0
Bank Erosion (Impact 1 - 25)	0
Channel Modification (Impact 1 - 25)	5
Water Abstraction (Impact 1 - 25)	3
Inundation (Impact 1 - 25)	3
Flow Modification (Impact 1 - 25)	7
Water Quality (Impact 1 - 25)	0
INTEGRITY CLASS	A

TABLE 4. INDEX OF HABITAT INTEGRITY ASSESSMENT RESULTS AND CRITERIA ASSESSED FOR INSTREAM ZONE OF THE AFFECTED SECTION OF STREAM A.

INSTREAM HABITAT INTEGRITY	Stream A
Water Abstraction (Impact 1 - 25)	6
Flow Modification (Impact 1 - 25)	6
Bed Modification (Impact 1 - 25)	5
Channel Modification (Impact 1 - 25)	3
Water Quality (Impact 1 - 25)	2
Inundation (Impact 1 - 25)	5
Exotic Macrophytes (Impact 1 - 25)	0
Exotic Fauna (Impact 1 - 25)	0
Rubbish Dumping (Impact 1 - 25)	0
INTEGRITY CLASS	B

Findings:

The IHI assessment compared with the site observations in that the riparian and instream integrity of the stream was found to be in a Natural (riparian) to Largely Natural (instream) state throughout the property.

Existing impacts occur at the large upstream dam (on adjacent property) and the smaller downstream dam, impacting mostly on flow modification, water abstraction and inundation. Due to the ephemeral nature of the stream, the dams has not had any detrimental impacts on the stream.

Ecological Importance and Sensitivity (EIS)

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 EIS assessment considers a number of biotic and habitat determinants construed to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category. The EIS assessment was done for the section of the Unnamed Stream affected by the proposed two bridge structures.

TABLE 5. 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 6. 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

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	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

TABLE 7. RESULTS OF THE EIS ASSESSMENT

Biotic Determinants	Stream A
Rare and endangered biota	2
Unique biota	2
Intolerant biota	1,5
Species/taxon richness	3
Aquatic Habitat Determinants	
Diversity of aquatic habitat types or features	1,5
Refuge value of habitat type	2
Sensitivity of habitat to flow changes	1
Sensitivity of flow related water quality changes	1
Migration route/corridor for instream and riparian biota	2
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	1
Total	1.7
EIS CATEGORY	Moderate

Findings:

The EIS for the quaternary catchment area H4oL is 2,3 (High) and 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. This score is slightly higher than that found for Stream A, and could be attributed to Stream A's ephemeral nature, and thus being less sensitive to especially flow modifications.

Hydrology and EWR requirements

As the development does not entail any additional taking of water, no EWR requirement would apply to the construction and operation of this development.

Recommended Ecological Category

The REC for Stream A and its associated tributaries was determined taking into account the results of the IHI, PES and EIS assessments. These assessments show that Stream A is in a Natural to Largely natural state with Moderate EIS, and would thus be recommended to be managed in a B class.

Freshwater delineation and Buffer zones

As mentioned, freshwater features found on site included Stream A and its tributaries as well as 2 drainage lines located further west on the property. Considering the state and REC of Stream A, all future development should fall outside of a 20m buffer zone (figure – Purple lines) or the edge of the riparian zone for the mainstream, with a 15m buffer (figure – Yellow lines) applying to the tributaries and other two drainage lines.

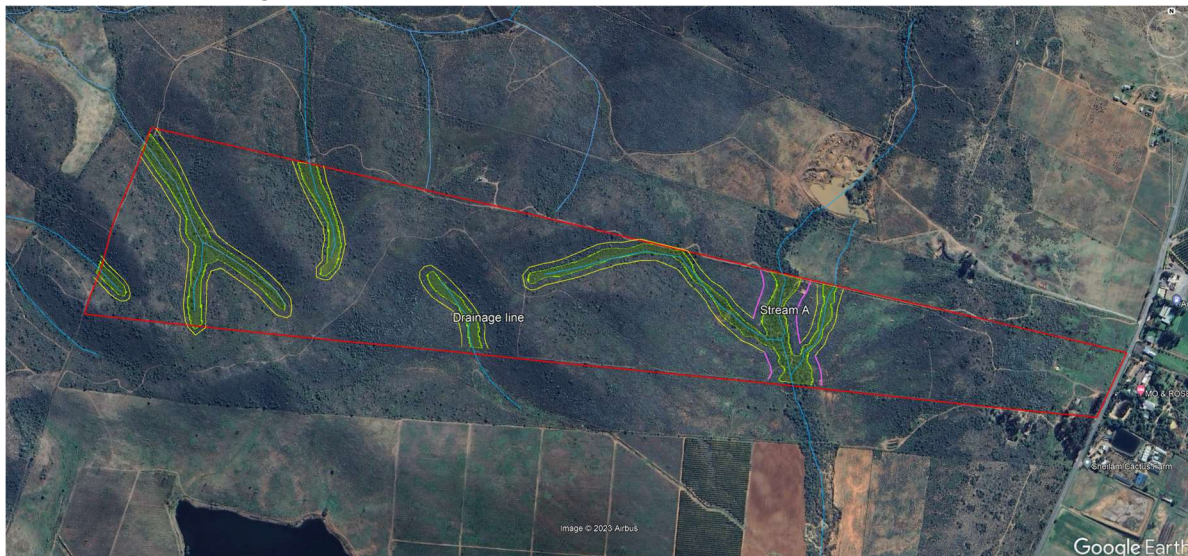


Figure 13: A marked satellite image indicating the property boundary (red polygon), the affected freshwater features (Blue lines) with their riparian zones (green polygons) and the proposed buffer zones (Purple line – 20m and Yellow – 15m).

Impact Assessment

The freshwater impacts are rated in accordance with the Environmental Impact Assessment Regulations, 2014 (as amended GN 517 in GG 44701 of 11 June 2021) 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 DEA&DP Guideline for Involving Biodiversity Specialists in EIA Processes (DEAT, 2005).

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 were formulated as well as the significance of the impacts, assuming that the mitigation measures are implemented in full, are assessed.

Since the initial development concept, the final development layout plan has been decided on and is indicated in Figure ?. If development occurs according to this layout plan, all freshwater features together with their buffer zones would be kept outside of the development footprint, and minimal impacts are expected on the following:

- Loss of biodiversity around freshwater features;
- Small Flow modification and Water quality impacts.

Potential Impact – Loss of biodiversity:

As all freshwater features on site were found to be in a Largely natural to Natural state, with high biodiversity (especially Stream A), loss of biodiversity through surrounding development could be a possible impact. Considering that the final layout plan, includes the suggested conservation of freshwater features, together with their buffer zones (as indicated figure 13), loss of biodiversity through clearing and planting of the surrounding areas is expected to have a **Low negative impact** directly on the freshwater features and their riparian zones, as well as the receiving freshwater system during both the construction and operational phase.

Proposed mitigation:

Construction phase:

- As stated during the pre-planning phase, in general, development over the named watercourses on site is not supported from a freshwater perspective;
- No new roads are to be constructed over the streams, with only existing roads to be used;
- It is proposed that a 15m buffer (from the drainage lines and tributaries) and 20m buffer (from Stream A), be kept during all clearing and development activities;

- During construction activities, all stream sections beyond the buffer zones should strictly be treated as a No-Go area;

Operational phase:

- All future development should fall outside of a 15m buffer zone (from the drainage lines and tributaries) and 20m buffer zone (from Stream A).
- Should any stormwater/drainage channels be established within the cultivation areas, such channels should be properly vegetated, preferably with indigenous vegetation such as Kweek grass (*Cynodon dactylon*), which should stabilise the banks and would create opportunity for other surrounding indigenous vegetation to establish and lower the risk of erosion.

Potential Impact – Water quality impacts

During the construction phase, the clearing of vegetation and disturbance of soil at the development areas could pose the opportunity for erosion and resulting sedimentation towards the receiving freshwater features. With the incorporated buffer zones around the freshwater features, this impact is expected to be of **general short-term Low Negative nature**.

Considering the nature of the development, which would include the irrigation and fertilisation of cultivated areas the operational phase, runoff from the developed areas could have an impact on water quality within the small streams. The ephemeral nature of these streams, with general low flows (when flowing), will further amplify this impact. Erosion from the newly planted areas could also have an impact on the receiving freshwater features. Once again, considering that the proposed buffer zones will now be part of the development, buffering this impact, together with the fact that the whole downstream section of Stream A (including the drainage line), falling south of the R60, has been completely modified through instream dams (with large abstraction) and artificial channelling, the impact of the development around the freshwater features falling within the property, is deemed to have a **low to negligible impact** on any of the receiving freshwater features.

To minimise any further impact the clearing, planting and operational activities might have on the freshwater features, the following mitigation measures are proposed in order to protect the streams against water quality impacts.

Construction phase:

- Firstly, it would be proposed that clearing and planting take place during the drier summer months, when flow down the slopes will be at its lowest;
- All stream areas should be clearly demarcated by the stated buffer zones for both the construction and operational phase;
- Erosion berms, silt traps, etc. must be in place for all areas where vegetation removal or excavation activities occur to ensure excess sedimentation does not enter the adjacent stream areas;

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- Construction materials must be stored at least 30m away from the adjacent stream areas and have suitable retention and bunding structures in place to prevent spills or run-off entering the streams.
- The following good site management should be practiced during the development phase:
 - Portable chemical toilets should be installed at all Work Sites or ensure that conveniently located site toilets are available, and these toilet sites may not be located within a horizontal distance of 100m of the identified stream areas.
 - Do not locate any reservoir, dam or depot for any substance which causes or is likely to cause pollution within the 1:100 year flood line, or within a horizontal distance of 100m of the identified stream areas.
 - Do not dump waste of any nature, or any foreign material into the streams, nor are these areas to be used for cleaning of clothing, tools or equipment.
 - Carefully control all on-site operations that involve the use of cement and concrete (this applies to areas other than the batching plant).
- All contaminated runoff from the construction site should be prevented from directly entering the freshwater features.

Operational phase:

- As mentioned above, stated buffer zones should be kept for all future activities.
- It is proposed that good floor management practices are followed, such as seasonal cover crops in between orchard/vineyard rows, or by mulching the ground, in order to minimize erosion.

Summary of the expected impacts:

TABLE 10: SUMMARY OF THE EXPECTED IMPACTS RELATING TO THE CONSTRUCTION PHASE.

SITE CLEARANCE, CONSTRUCTION PHASE				
	Preferred Alternative		No-go alternative	
Nature of impact:	Impact on the aquatic ecology and biodiversity of all the affected freshwater features (as described above)		No impact as the area would be left in its natural state.	
Description and consequence of impact or risk:	Loss or disturbance of the aquatic biodiversity directly within Stream A and the drainage lines.		N/A	
Indirect impacts:	Water quality and the possibility of erosion and sedimentation towards downstream features.		N/A	
	Without mitigation	With mitigation	Without mitigation	With mitigation
MAGNITUDE of impact:	Low (-) This impact could result in a slight altering of the aquatic function and processes within the affected	Very Low (-) This impact could result in a very low to negligible altering of the aquatic function and processes within	N/A	N/A

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SITE CLEARANCE, CONSTRUCTION PHASE				
	Preferred Alternative		No-go alternative	
	freshwater features as well as the receiving downstream areas	the freshwater features.		
DURATION:	Long term More than 10 years.		N/A	
EXTENT (special scale/ influence of impact):	Local The impact should be limited mostly to the construction sites as well as the nearby downstream freshwater features.		N/A	
IRREPLACEABLE loss of resources:	Moderate potential Moderate potential for the loss of irreplaceable resources.		N/A	
INTENSITY and degree to which the impact can be REVERSED:	Low With the latest layout plan, incorporating proposed buffer zones, the natural processes of these streams will be altered minimally and the functions and processes can be reversed to their original state.		N/A	
PROBABILITY of occurrence:	Medium probability There is a distinct probability that the impact will occur.		N/A	
Significance rating of impact <u>without and with</u> mitigation:	Low (-) The overall significance of the above potential impact is predicted to be Low. Impacts are in an acceptable range, but should be mitigated to lower significance levels where possible.	Very Low (-) With mitigation, the overall significance of the above potential impacts is predicted to be Very low, and within the acceptable range.	N/A	N/A
Cumulative impact:	Limited		None	

TABLE 11: SUMMARY OF THE EXPECTED IMPACTS RELATING TO THE OPERATION PHASE.

OPERATIONAL PHASE		
	Preferred Alternative	No-go alternative
Nature of impact:	Impact on the aquatic ecology and biodiversity of all the affected freshwater features (as described above)	No impact as the area would be left in its natural state.

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OPERATIONAL PHASE				
	Preferred Alternative		No-go alternative	
Description and consequence of impact or risk:	Direct impacts during the operational phase will only apply in the event that mitigation measures are not met during the this phase. In such event, long term loss of ecology and biodiversity will occur within the affected sections of the freshwater features.		N/A	
Indirect impacts:	Possibility of water quality impairment through erosion from the surrounding cultivated areas, as well as eutrophication of the freshwater system through washing out salts and fertilisers as part of irrigation runoff towards the streams.		N/A	
	Without mitigation	With mitigation	Without mitigation	With mitigation
MAGNITUDE of impact:	Medium low (-) This impact could result in a remarkable altering of the aquatic function and processes within all affected freshwater features.	Low (-) Natural functioning of the environment is minimally affected, with mitigation.	N/A	N/A
DURATION:	Long term Impact will occur during the whole operational phase of the planted area.		N/A	
EXTENT (special scale/ influence of impact):	Local The impact will be limited to the sites and its immediate surrounding environment.		N/A	
IRREPLACEABLE loss of resources:	Medium potential Medium potential for the loss of irreplaceable resources. Resources can be replaced with effort.		N/A	
INTENSITY and degree to which the impact can be REVERSED:	Low to Medium Natural functioning of environment remarkably affected. Natural processes can be reversed to their original state.		N/A	
PROBABILITY of occurrence:	Medium probability There is a distinct probability that the impact will occur	Medium probability There is a low to distinct probability that the impact will occur	Medium probability There is a distinct probability that the impact occurred.	
Significance rating of impact <u>without and with</u> mitigation:	Medium Low (-) The significance of the above potential impact is predicted to generally be within the acceptably range, but should be mitigated to lower significance	Low to Very Low(-) This impact would result in a low alteration of the aquatic function within the affected Freshwater features.	N/A	N/A

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OPERATIONAL PHASE				
	Preferred Alternative		No-go alternative	
	levels possible.	wherever		
Cumulative impact:	Limited		Limited	

Risk Assessment:

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 (attached under Annexure B).

The activities associated with the construction and operational phases of the proposed clearing activities include site preparation, excavation of soils, the installation of the infrastructure, planting of vines, and operation of the cultivated areas. If activities commence without the implementation of mitigation measures, a remarkable loss of freshwater features could occur, and the activities are expected to have a Medium to Low risk to the surrounding streams. This would not be supported from a freshwater point of view, and it is required that all mitigation measures as stipulated above, together with the proposed buffer zones around the streams, must be implemented in full to mitigate and minimize any possible negative effects to the freshwater features on site. Should mitigation measures be applied in full the risk of impact would be considered to be **low**.

Results and recommendations

Freshwater features found on site include Stream A with its associated tributaries as well as several other drainage lines located towards the west of the development area. Stream A originates on the foothill slopes of the Langeberg Mountain to the north, flowing southwards through the property and further downstream towards the Breede River. The stream would have historically flowed all the way to the Breede River, but is currently caught in a large dam just after passing under the R60 and is further downstream completely channeled in an artificial channel towards the river. From the field assessment, the drainage lines were found to be purely that, watercourses only channeling water for a short time during heavy rain spells, and was thus not included in the detail assessments, but addressed in the impact assessment and recommendations.

From a vegetation and biodiversity point of view, all freshwater features on site, presents high ecological function and is associated with the Robertson Karoo vegetation type. From the 2017 Western Cape Biodiversity Spatial Plan most of the stream is classified as an Ecological Support Area (ESA1 and 2 -

Watercourse, Water Source). These areas are not essential for meeting biodiversity targets but play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. These areas should be maintained in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised. From the NFEPA map, the larger catchment in which the area falls, does not lie within a FEPA, with only the existing farm dams indicated as FEPA wetlands.

The IHI assessment compared with the site observations in that the riparian and instream integrity of the stream was found to be in a Natural (riparian) to Largely Natural (instream) state throughout the property. The EIS for the quaternary catchment area H4oL is 2,3 (High), which is slightly higher than that found for Stream A (Moderate), and could be attributed to Stream A's ephemeral nature, and thus being less sensitive to especially flow modifications. From the field assessment, all drainage lines were also found to still be in a natural state. The REC for freshwater features found on site would be recommended to be managed in a B class. Considering buffer zones, a 20m buffer zone from the edge of the riparian zone for the main stream (Stream A), and a 15m buffer applying to the tributaries and other drainage lines is proposed.

With the latest layout plan, incorporating the proposed buffer zones, the impact of the surrounding area could pose the following impacts:

- Loss of biodiversity;
 - **Low negative impact of Local scale** without the implementation of mitigation measures.
 - **Very Low negative impact of Local scale** with mitigation measures in place.
- Water quality impacts.
 - **Medium-low long-term negative impact of local scale** on the freshwater features without any mitigation measures in place.
 - **Long-term Low to Very Low negative impact of local scale.**

Mitigation measures proposed to minimize the impact of the proposed development are as follows:

Construction phase:

- As stated during the pre-planning phase, in general, development over the named watercourses on site is not supported from a freshwater perspective;
- No new roads are to be constructed over the streams, with only existing roads to be used;
- It is proposed that a 15m buffer (from the drainage lines and tributaries) and 20m buffer (from Stream A), be kept during all clearing and development activities;
- During construction activities, all stream sections beyond the buffer zones should strictly be treated as a No-Go area;
- Clearing and planting should preferably take place during the drier summer months, when flow down the slopes will be at its lowest;

- Erosion berms, silt traps, etc. must be in place for all areas where vegetation removal or excavation activities occur to ensure excess sedimentation does not enter the adjacent stream areas;
- Construction materials must be stored at least 30m away from the adjacent stream areas and have suitable retention and bunding structures in place to prevent spills or run-off entering the streams.
- The following good site management should be practiced during the development phase:
 - Portable chemical toilets should be installed at all Work Sites or ensure that conveniently located site toilets are available, and these toilet sites may not be located within a horizontal distance of 100m of the identified stream areas.
 - Do not locate any reservoir, dam or depot for any substance which causes or is likely to cause pollution within the 1:100 year flood line, or within a horizontal distance of 100m of the identified stream areas.
 - Do not dump waste of any nature, or any foreign material into the streams, nor are these areas to be used for cleaning of clothing, tools or equipment.
 - Carefully control all on-site operations that involve the use of cement and concrete (this applies to areas other than the batching plant).
- All contaminated runoff from the construction site should be prevented from directly entering the freshwater features.

Operational phase:

- All future development should fall outside of a 15m buffer zone (from the drainage lines and tributaries) and 20m buffer zone (from Stream A).
- Should any stormwater/drainage channels be established within the cultivation areas, such channels should be properly vegetated, preferably with indigenous vegetation such as Kweek grass (*Cynodon dactylon*), which should stabilise the banks and would create opportunity for other surrounding indigenous vegetation to establish and lower the risk of erosion.
- It is proposed that good floor management practices are followed, such as seasonal cover crops in between orchard/vineyard rows, or by mulching the ground, in order to minimize erosion.

Conclusion

Due to the largely natural state, high ecological function and moderate EIS of the streams, loss of freshwater features on site due to clearing and planting of agricultural land, in general, is not supported. With the newest layout plan, incorporating the proposed buffer zones, together with other suggested mitigation measures, much of the negative impact is alleviated and the proposed development is deemed to have a **cumulatively low negative impact on the directly affected freshwater features, and a negligible impact on the larger freshwater system (including the Breede River)**. As these streams are defined as a watercourse, any listed activities that are to take place within 32 meters thereof will

require authorization in terms of the relevant regulations of NEMA. In addition, the 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 be required for the proposed.

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



The following criteria has been used to evaluate significance of impacts (DEA&DP GUIDELINE FOR INVOLVING BIODIVERSITY SPECIALISTS IN EIA PROCESSES, 2005):

NATURE OF THE IMPACT – A description of positive or negative effect of the project on the affected environment, or vice versa.

This description should include who or what would be affected, and how.

EXTENT - the impact could:

- be site – specific;
- be limited to the site and its immediate surroundings;
- have an impact on the region (e.g. if communities rely on biodiversity);
- have an impact on a national scale (e.g. national biodiversity conservation targets);
- have an impact across international borders (e.g. where catchments cross international border, international conventions are concerned, or migratory species).

DURATION – It is important to indicate whether or not the lifetime of the impact will be:

- short term (e.g. during the construction phase);
- medium term (e.g. during part or all of the operational phase);
- long term (e.g. beyond the operational phase, but not permanently);
- permanent (where the impact is for all intents and purposes irreversible. An irreversible negative impact may also result in irreplaceable loss of natural capital or biodiversity, if it were to result in extinction or loss of a species or ecosystem); or
- discontinuous or intermittent (where the impact may only occur during specific climatic conditions or during a particular season of the year).

INTENSITY OR MAGNITUDE – The size of the impact (if positive) or its severity (if negative):

- low, where biodiversity is negligibly affected or where the impact is so low that remedial action is not required;
- medium, where biodiversity pattern, process and/or ecosystem services are altered, but not severely affected, and the impact can be remedied successfully; and
- high, where pattern, process and/or ecosystem services would be substantially (i.e. to a very large degree) affected. If a negative impact, could lead to irreplaceable loss of biodiversity and/or unacceptable consequences for human wellbeing.

PROBABILITY – Should describe the likelihood of the impact actually occurring indicated as:

- improbable, where the possibility of the impact is very low either because of design or historic experience;
- probable, where there is a distinct possibility that the impact will occur;
- highly probable, where it is most likely that the impact will occur; or

- definite, where the impact will occur regardless of any prevention measures.

SIGNIFICANCE – The significance of impacts can be determined through a synthesis of the assessment criteria. Significance can be described as:

- low, where it would have negligible effect on biodiversity, and on the decision;
- medium, where it would have a moderate effect on biodiversity, and should influence the decision;
- high, where it would have, or there would be a high risk of, a large effect on biodiversity. These impacts should have a major influence on the decision;
- very high, where it would have, or there would be a high risk of, an irreversible impact on biodiversity and irreplaceable loss of natural capital. Impacts of very high significance should be a central factor in decision-making.

CONFIDENCE – The level of confidence in predicting the impact can be described as:

- low, where there is little confidence in the prediction, due to inherent uncertainty about the likely response of the receiving ecosystem, or inadequate information;
- medium, where there is a moderate level of confidence in the prediction; or

high, where the impact can be predicted with a high level of confidence



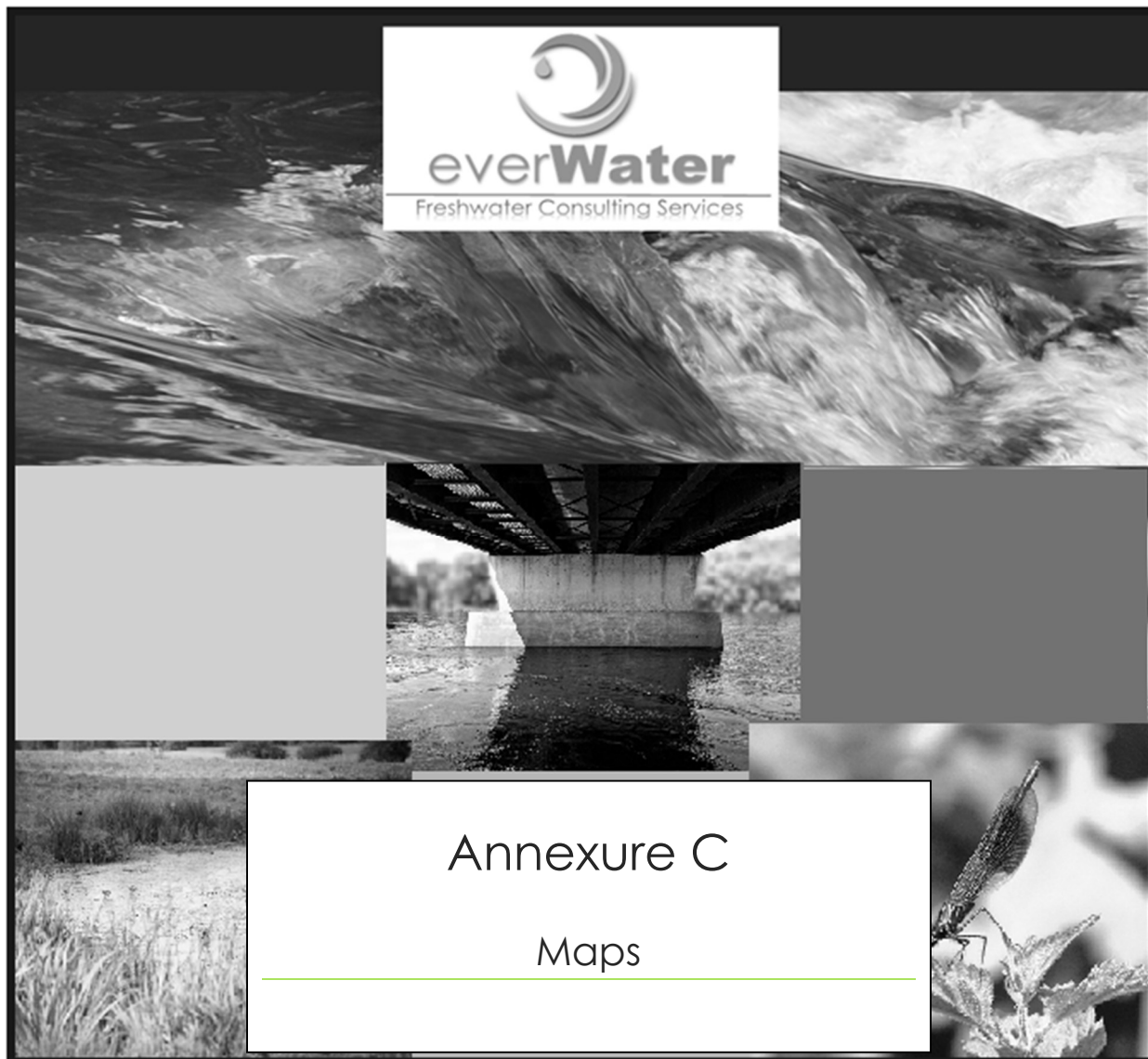
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RISK MATRIX (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)

NAME and REGISTRATION No of SACNASP Professional member:Jeanne Snyman..... Reg no.400091/17.....

Risk to be scored for construction and operational phases of the project. MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

No.	Phases	Activity	Aspect	Impact	Severity				Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating	Confidence level	Control Measures	PES AND EIS OF WATERCOURSE
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Vegetation)	Biota														
1	Construction phase	Construction activities related to the proposed new agricultural development	Site Access	Altering the bed and banks, Loss of biodiversity.	0	0,5	0,5	0,5	0,375	1	2	3,375	1	1,5	5	1	8,5	28,69	L	95	See mitigation measures in Freshwater Assessment.	PES = A EIS = High
2		Excavation of soils as part of site preparation	Excavation of soils as part of site preparation	Altering the surrounding landscape. Loss of Biodiversity. Some water quality impacts.	0,5	2	2	2	1,625	1	1	3,625	1	4	5	1	11	39,88	L	95		
3		Installation of infrastructure and planting of vines.	Installation of infrastructure and planting of vines.	Altering the surrounding landscape. Loss of Biodiversity. Some water quality impacts.	0,5	2	1	1	1,125	1	1	3,125	1	4	5	1	11	34,38	L	95		
4	Operational Phase	Operational Phase - Newly planted areas	All general agricultural operations associated with vineyards.	Further altering of bed and banks loss of biodiversity and aquatic habitat;	2	2	1	2	1,75	1	3	5,75	1	2	5	1	9	51,75	L	90	See mitigation measures in Freshwater Assessment.	PES = A EIS = High



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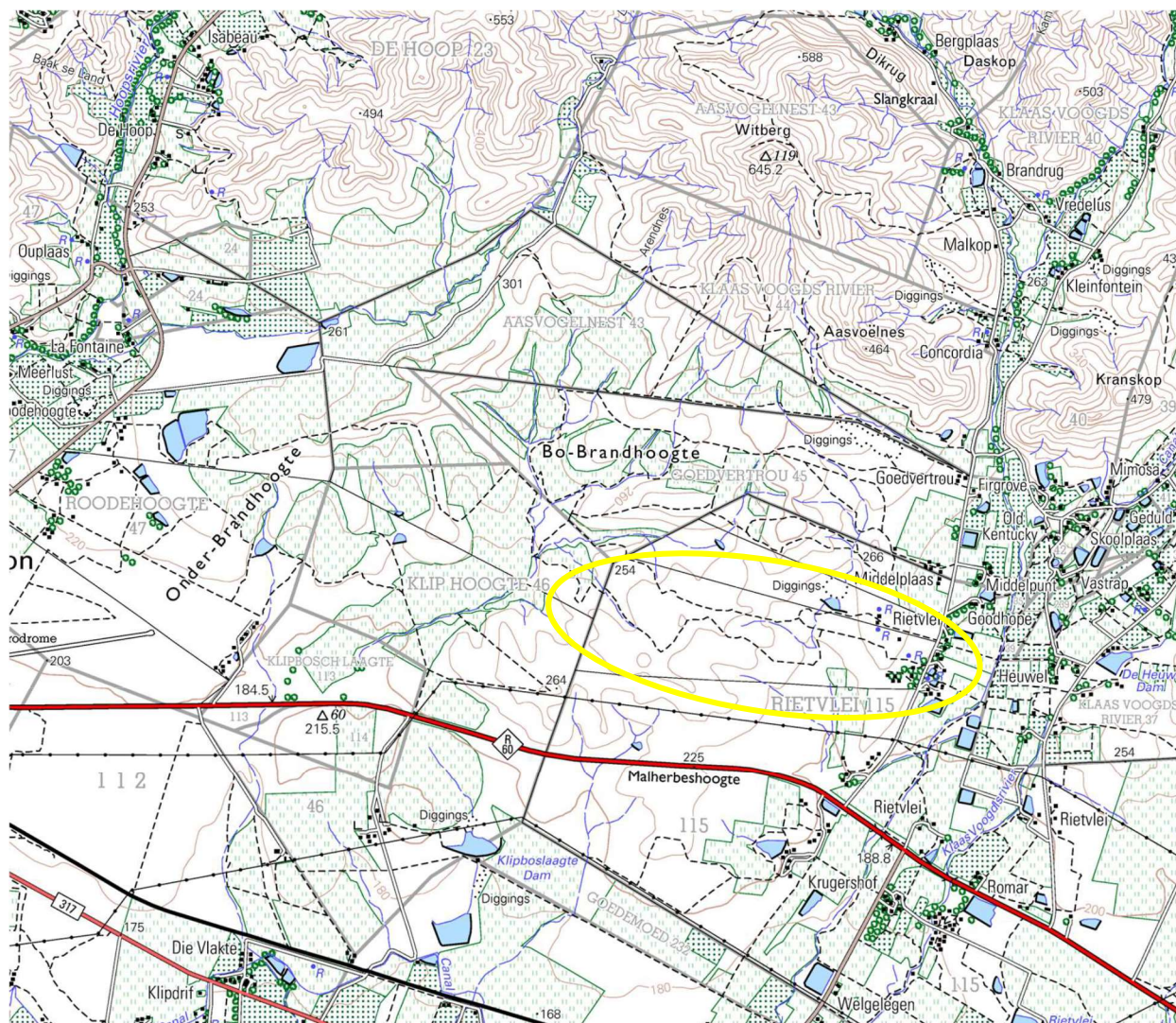


Figure C-1: 1:50 000 Topographical map of the area with the location of the proposed development (3319 DD)

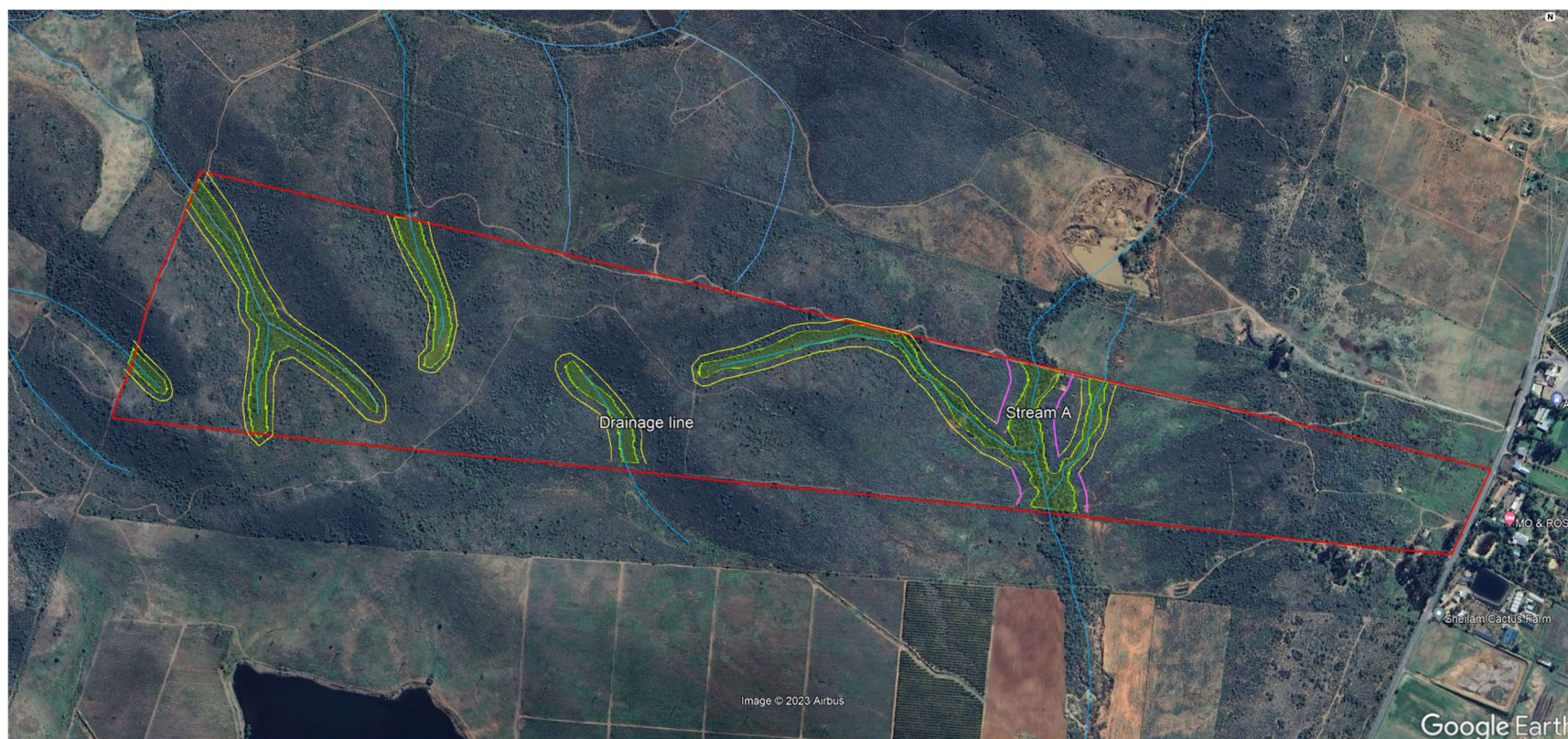


Figure C-2: A marked satellite image indicating the property boundary (red polygon), the affected freshwater features (Blue lines) with their riparian zones (green polygons) and the proposed buffer zones (Purple line – 20m and Yellow – 15m).

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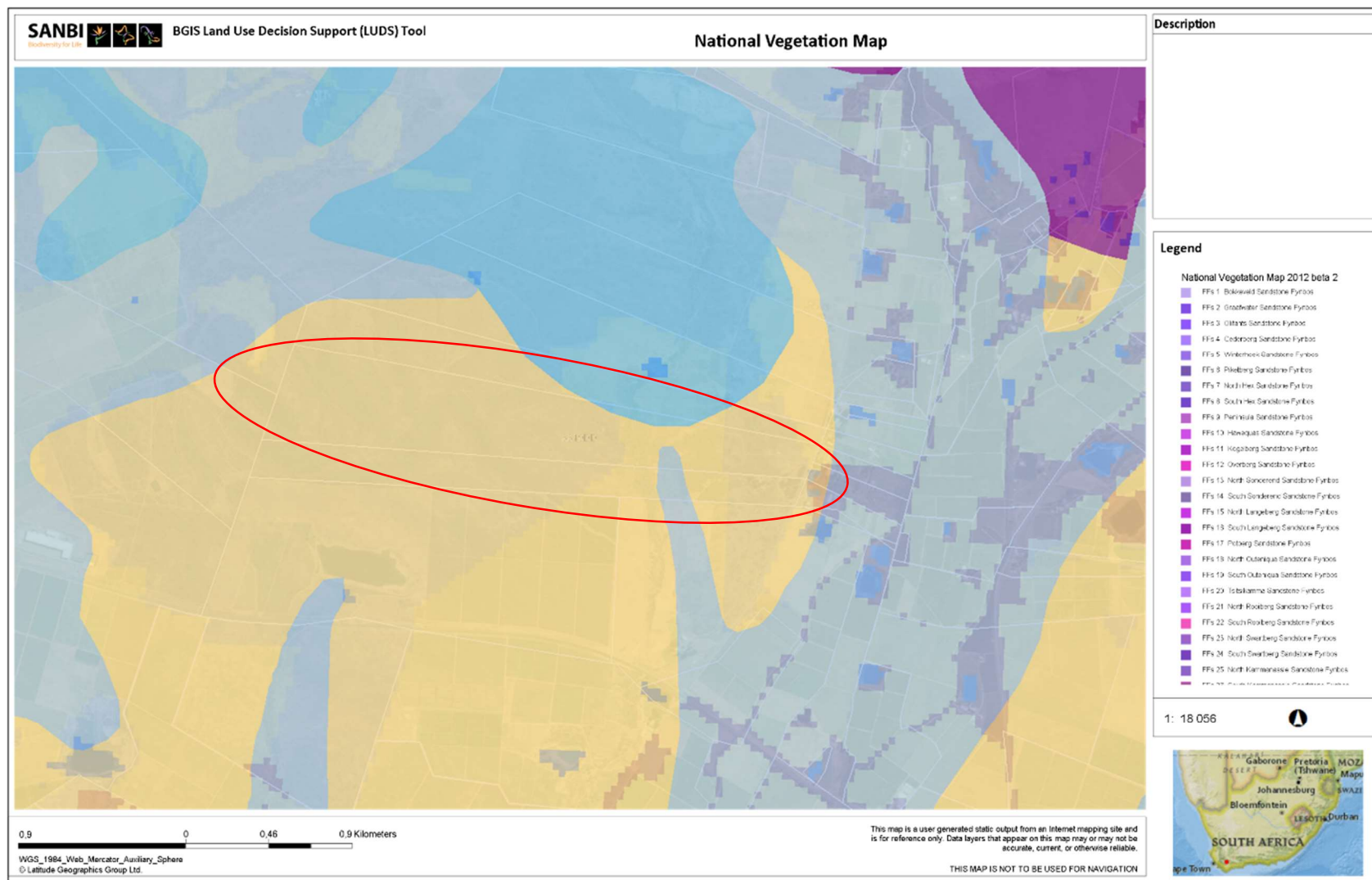


Figure C-3: National vegetation map for the area (SANBI GIS, 2021)

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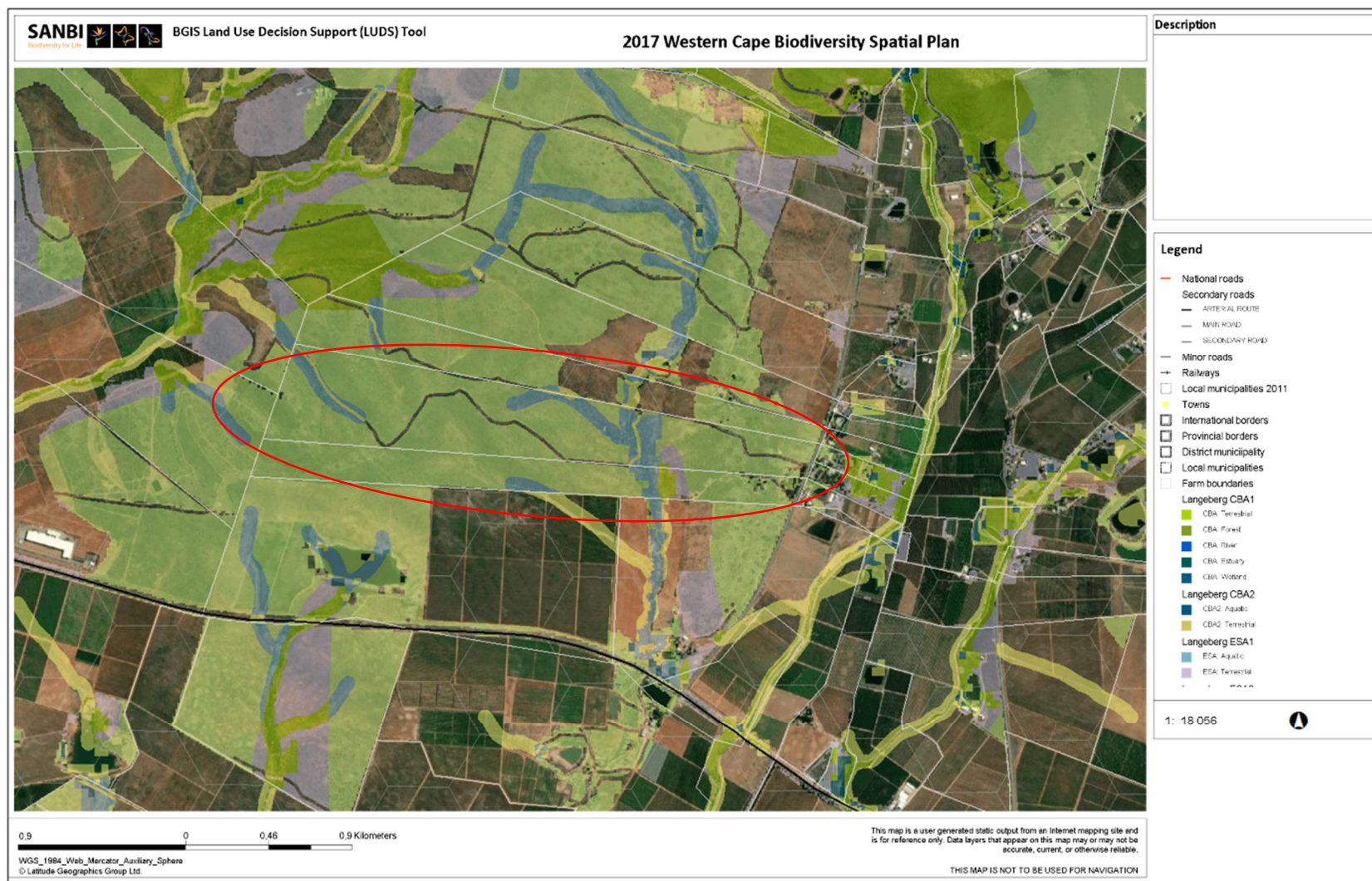


Figure C-4: The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) map (SANBI GIS, 2021)

FRESHWATER ASSESSMENT FOR THE PROPOSED DEVELOPMENT ON PORTION 39 OF THE FARM RIETVALLEI 115, ROBERTSON, WESTERN CAPE

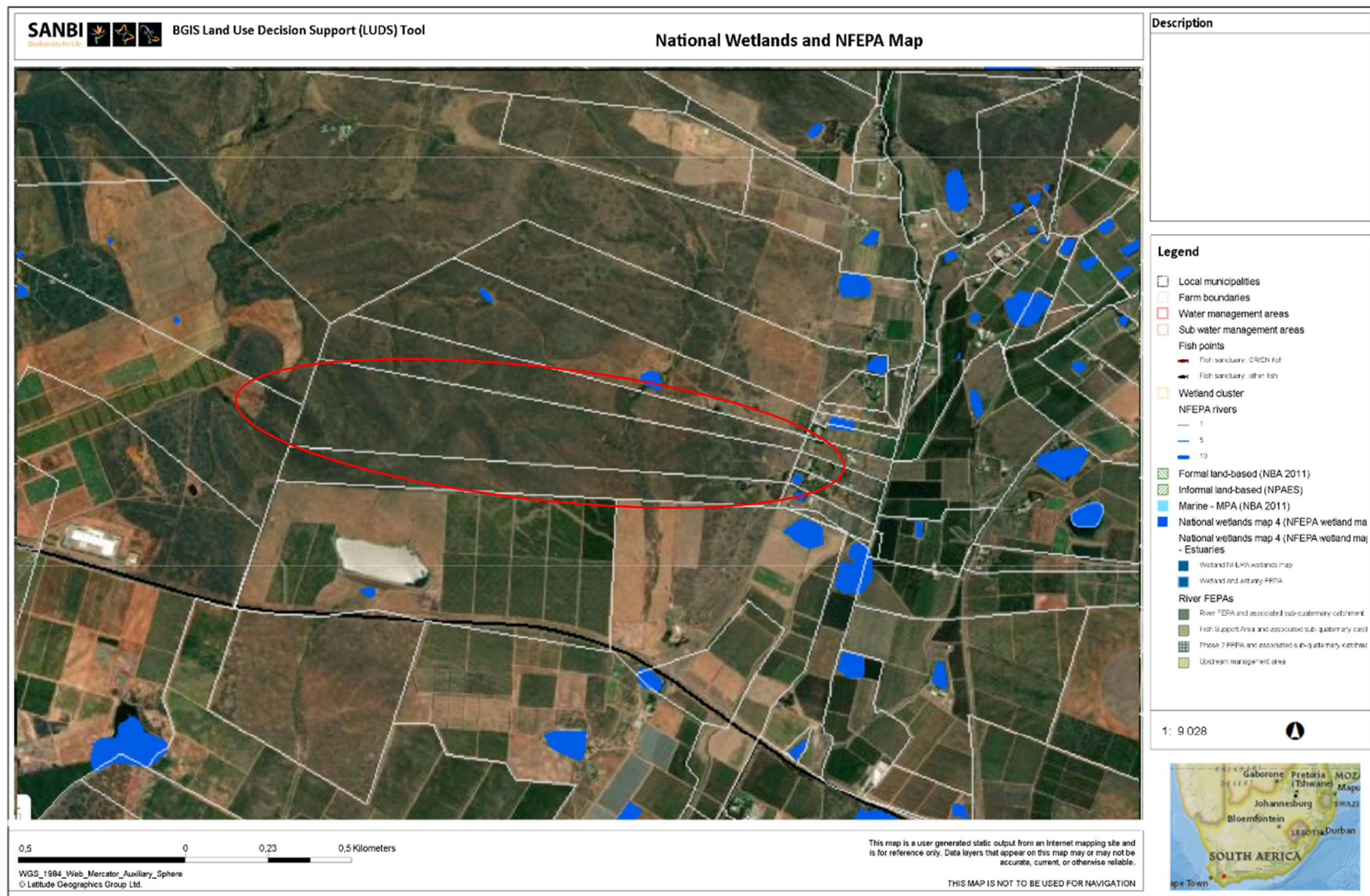


Figure C-5: NFEPA map for the area (SANBI GIS, 2023)