AQUATIC IMPACT ASSESSMENT REPORT FOR THE ALLEGED UNAUTHORISED ACTIVITIES AT FARM MELKHOUTRIVIER PORTION 1 OF NO. 492, MALGAS

July 2023

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TABLE OF CONTENTS

Table of Figures

List of Tables

1. SPECIALIST DETAILS, EXPERTISE AND DECLARATION

1.1. QUALIFICATIONS OF SPECIALIST CONSULTANT

Name: Antonia Belcher

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Email: toni@bluescience.co.za

Profession: Aquatic Scientist (P. Sci. Nat. 400040/10)

Fields of Expertise: Specialist in freshwater assessments, monitoring and reporting

Years in Profession: 30+ years

Toni Belcher worked for the Department of Water Affairs and Forestry for more than 17 years. During this period she worked for the Directorate Water Quality Management, the Institute for Water Quality Studies and the Western Cape Regional Office and has built up a wide skills base on water resource management and water resource quality for rivers, estuaries and the coastal marine environment. Since leaving the Department in 2007, she has been working in her private capacity and was co-owner of BlueScience (Pty) Ltd, working in the field of water resource management and has been involved in more than 500 aquatic ecosystem assessments for environmental impact assessment and water use authorisation purposes. In 2006 she was awarded a Woman in Water award for Environmental Education and was a runner up for the Woman in Water prize for Water Research.

Professional Qualifications:

1984	Matriculation Lawson Brown High School
1987	B.Sc. – Mathematics, Applied Mathematics University of Port Elizabeth
1989	B.Sc. (Hons) – Oceanography University of Port Elizabeth
1998	M.Sc. – Environmental Management (cum laude) Potchefstroom University

Key Skills: Areas of specialisation: Aquatic ecosystem assessments, Monitoring and evaluation of water resources, Water resource legislation and authorisations, River classification and Resource Quality Objectives, River Reserve determination and implementation, Water Quality Assessments, Biomonitoring, River and Wetland Rehabilitation Plans, Catchment management, River maintenance management, Water education.

Summary of Experience:

1987 – 1988	Part-time field researcher, Department of Oceanography, University of Port Elizabeth
1989 – 1990	Mathematics tutor and administrator, Master Maths, Randburg and Braamfontein Colleges, Johannesburg
1991 – 1995	Water Pollution Control Officer, Water Quality Management, Department of Water Affairs, Pretoria
1995 – 1999	Hydrologist and Assistant Director, Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria
1999 – 2007	Assistant and Deputy Director, Water Resource Protection, Western Cape Regional Office, Department of Water Affairs, Cape Town
2007 – 2012	Self-employed – Aquatic Specialist
2013 – 2020	Senior Aquatic Specialist and part-owner, BlueScience
2020 – present	Self-employed– Aquatic Specialist

1.2. DECLARATION OF INDEPENDENCE

I, A**ntonia Belcher,** as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
    - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
    - ~~am not independent, but another specialist that meets the general requirements set out in Regulation 13 of GN No. 326 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the Applicant, the Department and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations, 2014 (as amended).

Date: 3 June 2023

Name of company: -

Signature of the specialists: 

2. INTRODUCTION

2.1. BACKGROUND TO STUDY

The landowner of Portion 1 of Farm 492 Melkhoutivier near Malgas on the lower Breede River (Figure 1) cleaned out and re-established two instream dams within a watercourse, a smaller tributary of the Breede River Estuary. Since the activity (expansion of the dams) was undertaken within the watercourse and entailed the infilling/depositing of more than ten cubic metres of material, a Section 24G process is being undertaken. This report is intended to provide input into that process in terms of the associated aquatic ecosystem impacts and any recommended mitigation or rehabilitation measures required.

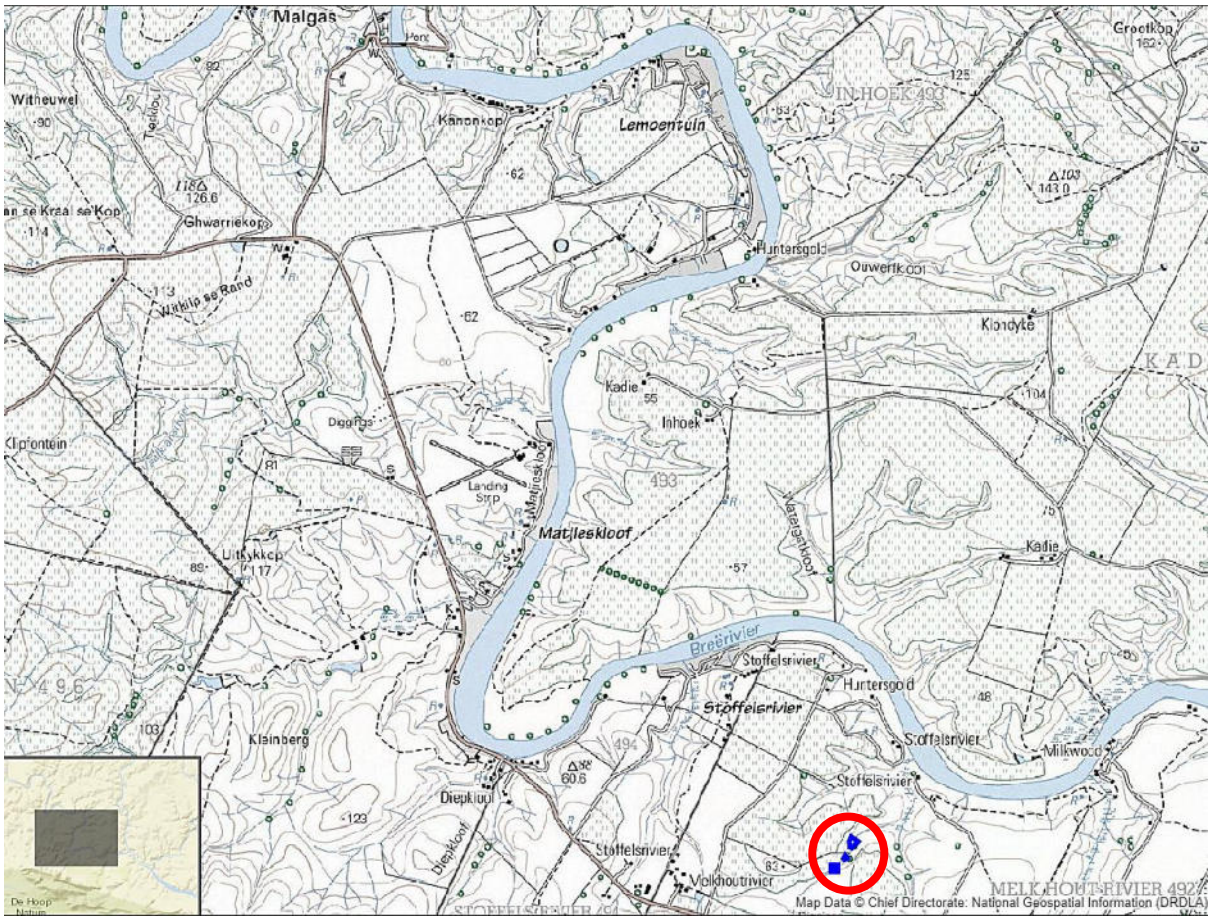

Figure 1. Locality Map for the site assessed near Malgas

Table 1 provides a summary of the water resource information for the study area.

Table 1. Summary of water resource information related to the activity undertaken

Descriptor	Name / Details	Notes
Water Management Area	Breede Gouritz	
Catchment Area	Minor tributary	Lower Breede River System
Quaternary Catchment	H70H	
Target Ecological State	B (Largely Natural)	Breede Estuary - Breede Gouritz Classes and RQOs (GG 42053, Nov 2018)
Latitude	34°21'32.7"S	Location of the lower dam wall
Longitude	20°37'45.5"E	

The study area is located largely within a wider area considered of Very High Aquatic Biodiversity Sensitivity (Figure 2). This is due to:

- Aquatic Critical Biodiversity Areas (CBAs) and Aquatic Ecological Support Areas (ESAs) in the lower Melkhout River and in the downstream Breede Estuary;
- Breede Estuary, which is mapped in the National Freshwater Ecosystem Priority Area (NFEPA) Wetlands layer as well as a National Wetland Map version 5 (NWM5) mapping, and
- Valley bottom and depression wetland mapping along the lower tributary in the NFEPA and NWM5 mapping.

The Aquatic CBAs, ESAs, NFEPA and NWM5-mapped features are discussed in Section 4.7 of this report. The potential impact of the activities on any wetland areas associated with the Melkhout River is assessed in this report.

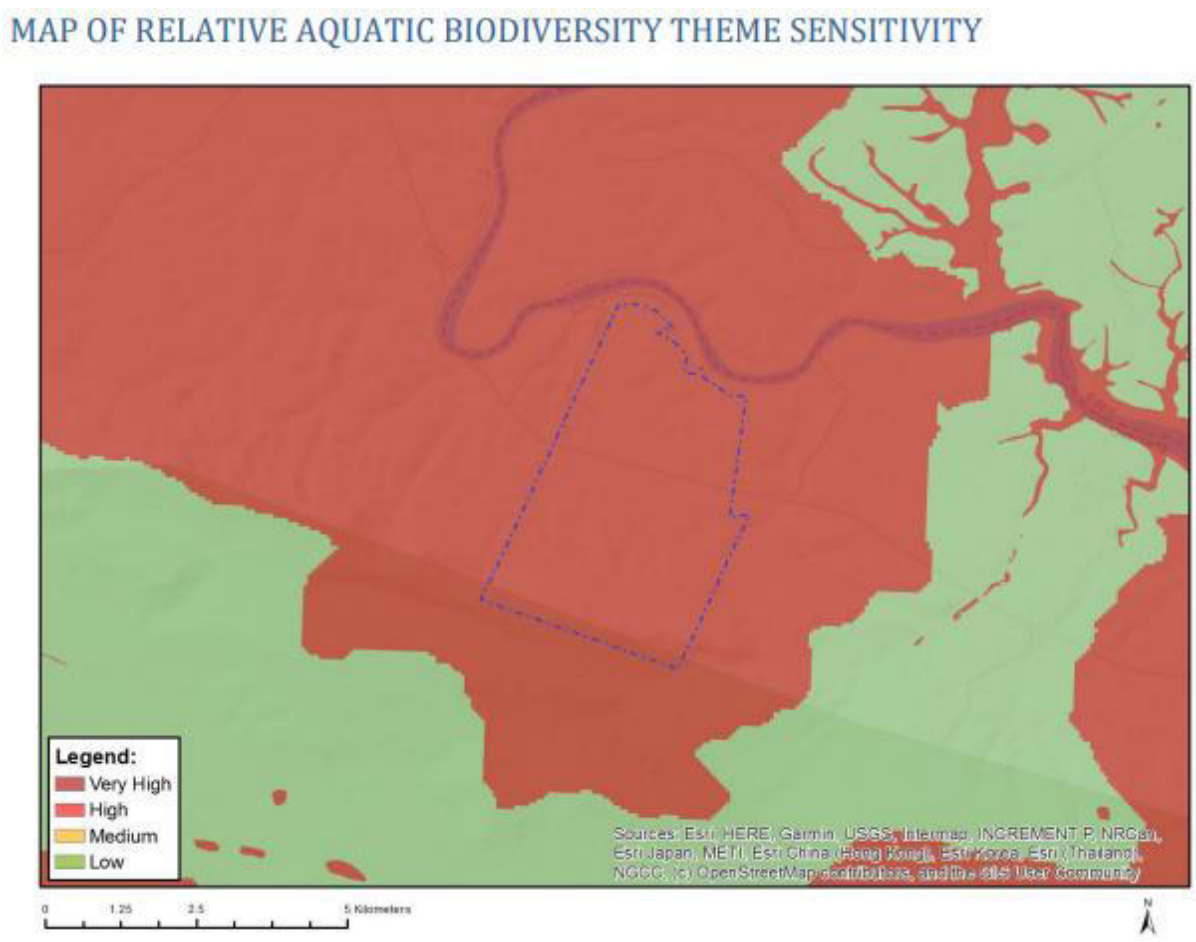

Figure 2. DFFE Screening Map for the area in terms of Aquatic Biodiversity Combined Sensitivity

2.2 Overview of the Study Area

The property lies at the foot of the northern slopes of the Potberg, between the De Hoop Nature Reserve and the Breede River Estuary (Quaternary catchment H70H). A minor tributary of the Breede

Estuary drains the northern extent of the property. The larger Melkhout Tributary of the Breede Estuary lies to the east of the property and the Stoffels River to the west of the farm. Within the property, several smaller watercourses drain into the tributary which drains from the lower slope of Potberg in the south, towards the estuary in the north. The farm is approximately 6.5 km southeast of Malgas and about 40 km southeast of Swellendam. Much of the surrounding land use is either natural, tourism/recreational or agricultural.

Within the farm, much of the natural vegetation on the valley floor, adjacent to the estuary has been disturbed by past agricultural activities (Figure 3). The minor tributary at the site comprises a small foothill stream with a defined riparian zone of indigenous and alien trees and shrubs that changes from being relatively natural on the upper slopes to becoming more modified on the valley floor where the channel is dominated by valley bottom wetland habitat.

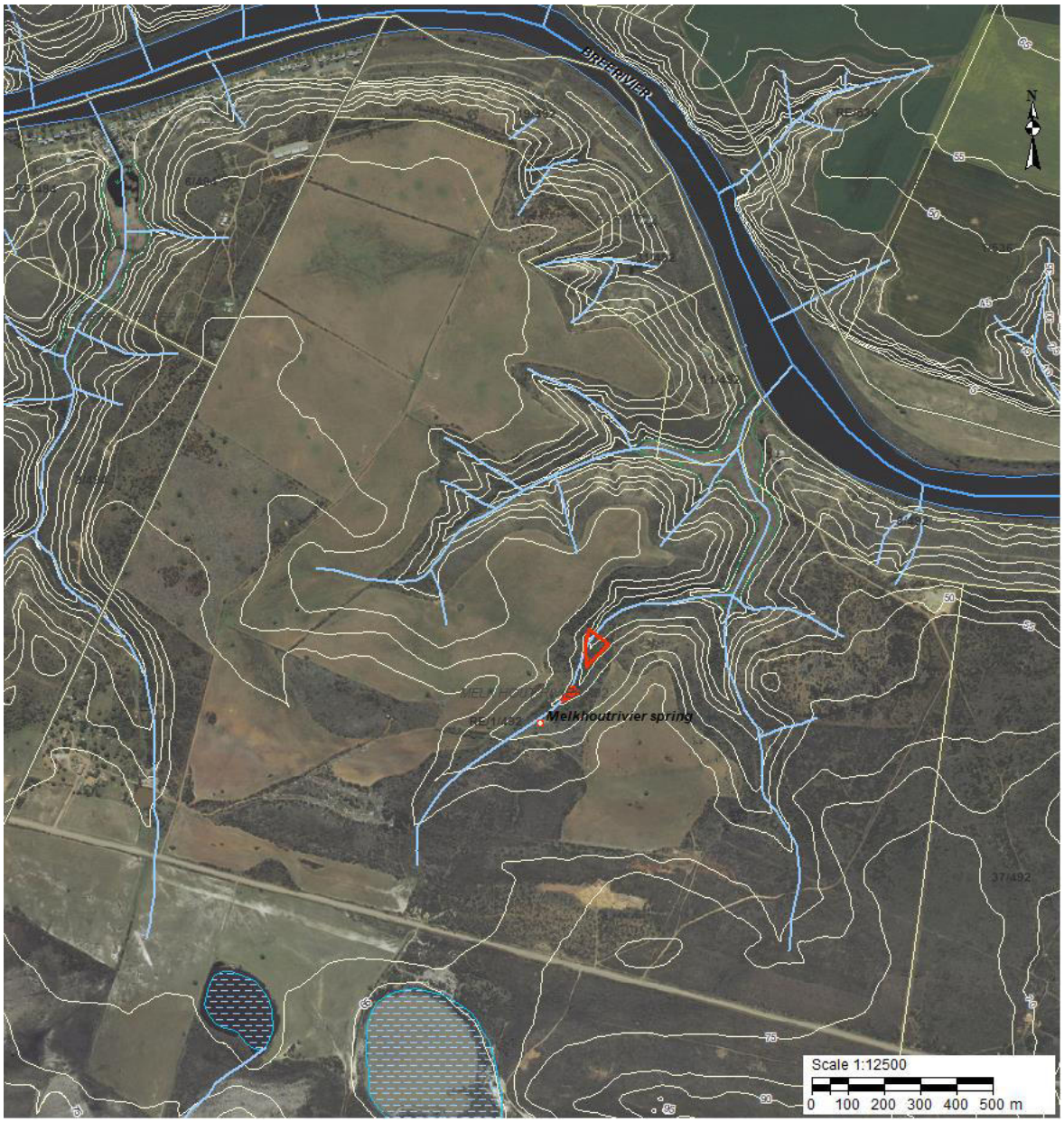

Figure 3. Topographical map of the study site and the surrounding area

2.3. Terms of Reference

The suggested work and agreed-upon tasks for this ***Freshwater Ecology Impact Assessment*** are as follows:

Impact Assessment requirements:

a) *The Freshwater Ecologist needs to visit the site, identify and ground truth all the hydrological resources associated with the site.*
b) *Meet with the project team on the farm or online if required.*
c) *EAP to provide standardised impact assessment table to be used.*
d) *Specialist to provide draft Report for internal comment.*
e) *Completion of Final Report for use in the formal WULA and S24G process.*
f) *Assist in the formulation of specialist responses during the public participation process.*
g) *All map layers to be made available in digital format, preferably kmz format.*
h) *Specialist report format to comply with Appendix 6 (NEMA requirements).*
i) *Specialist to complete DWS Risk Matrix for S21(c) and (i) water uses, develop mitigation measures and correlate with whether a GA or WULA will be required.*

2.4. Use of the Report

This report reflects the professional judgement of its author. The full and unedited content of this should be presented to the client. Any summary of these findings should only be produced in consultation with the author.

3. METHODOLOGY ASSUMPTIONS AND LIMITATIONS OF THE STUDY

Input into this report was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and catchment as well as by a more detailed assessment of the freshwater features at the site. The site was visited for a single day in November 2022. The timing of the assessment, although not ideal, was considered adequate for this assessment. Historical imagery, taken in the wet and dry periods, was also consulted to assist with the assessment.

During the field visit, characterisation and integrity assessments of the freshwater features were undertaken. The SANBI Biodiversity GIS, Cape FarmMapper and Freshwater Biodiversity Information System websites were also consulted to identify any constraints in terms of fine-scale biodiversity conservation mapped, freshwater features mapped in the Freshwater Ecosystem Priority Areas maps and freshwater biota present. This information/data was used to inform the water resource protection-related recommendations.

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:

- Analysis of the freshwater ecosystems was undertaken at a rapid level and did not involve detailed habitat and biota assessments;
- The river health assessment was carried out using the South African Department of Water and Sanitation developed methodologies. River Health assessments were carried out to provide information on the ecological condition and ecological importance and sensitivity of the river systems impacted.
- The guideline document, "A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas" document, as published by DWAF (2005) was followed for the delineation of the riparian and wetland areas.
- The ecological importance and sensitivity assessment were conducted according to the guidelines, as developed by DWAF (1999).
- The species mentioned in this report do not comprise a comprehensive list of all species which occur at the site. They are mentioned for descriptive purposes.

The level of aquatic assessment undertaken was considered to be adequate for this study.

4. DESCRIPTION OF THE SITE AND

4.1 VISUAL CHARACTERISTICS

The minor tributary within the property rises on the lower foothill of the Potberg and downslope of the gravel road to Infanta (altitude of about 65 m above mean sea level) and drains in the northerly direction to the Breede Estuary at an altitude of about 6 m above mean sea level over a distance of about 2 km (average slope of 3%). The two dams have been constructed at 35m and 27m above mean sea level respectively. The geomorphological character of the watercourse at the site resembles a lower foothill stream with alluvium dominating the substrate. While erosion is more typical in the upper reaches of the watercourse, sediment deposition dominates the lower reaches where there is also a dominance of wetland habitat. A spring occurs adjacent to the watercourse, just upstream of the two dams, at an altitude of about 42m above mean sea level.

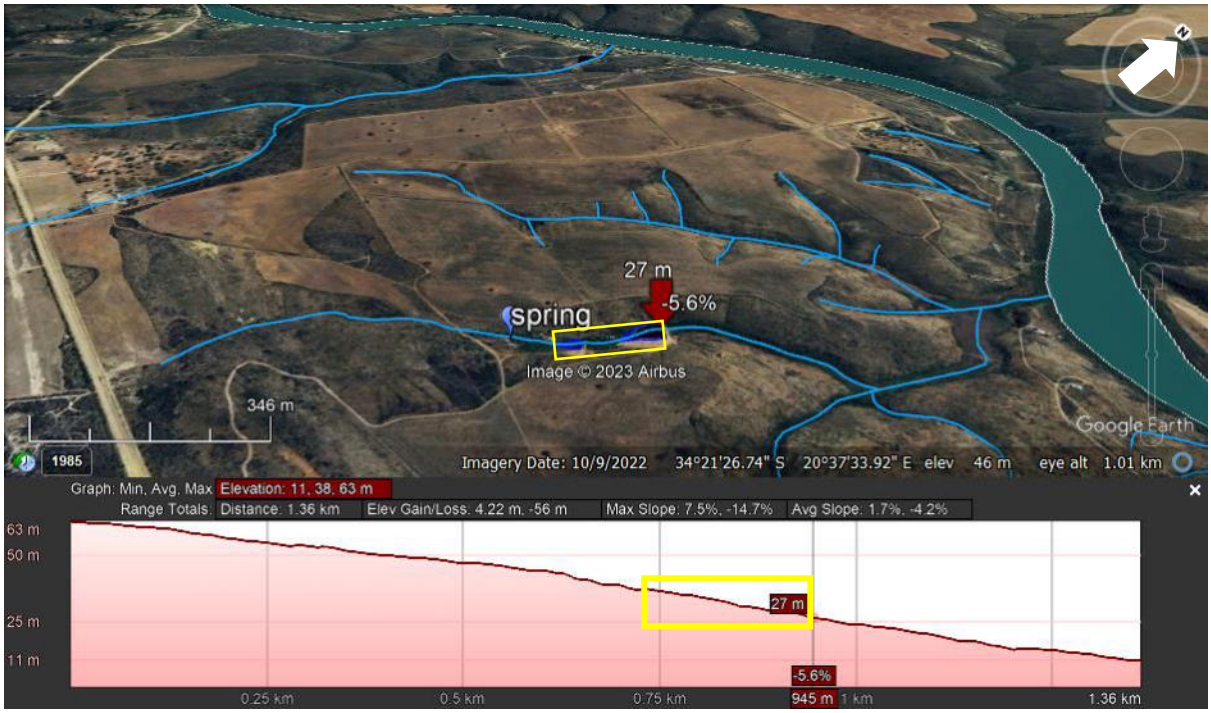

Figure 4. Elevation profile from Google Earth, showing the slope of the tributary, where the yellow polygon on the river profile corresponds to the location of the two instream dams on the image. Note the orientation of the Google Earth image has been rotated clockwise by about 75 degrees.

4.2 CLIMATE AND HYDROLOGY

The area has a Mediterranean climate and receives about 495mm of rain per year, mostly during winter. The average monthly rainfall and temperature values for the area can be seen in Figure 5. The lowest rainfall (15mm) is in January and the highest (43mm) is in August. The average midday temperatures for range from about 12°C in July to 22°C in January and February. The annual average evaporation for the quaternary catchment area H70H, in which the property is located, is 1195mm.

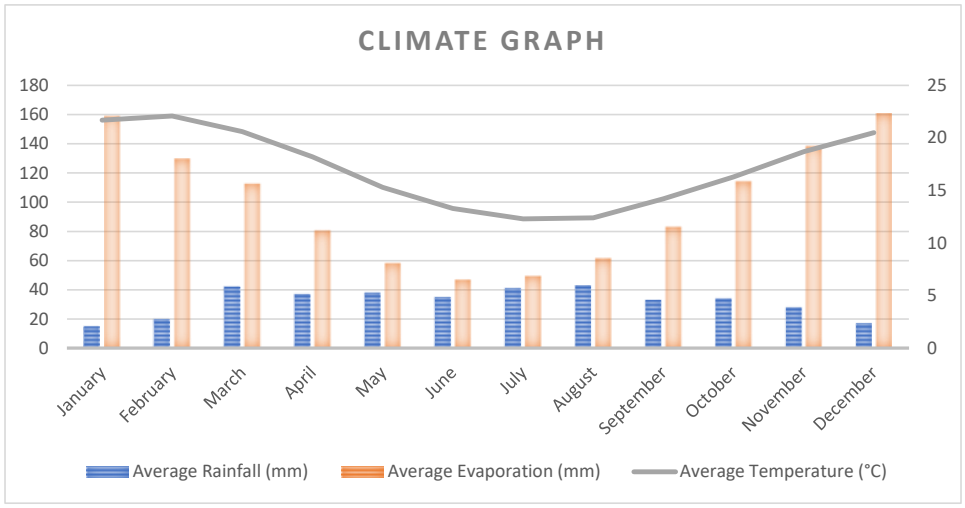

Figure 5. Average monthly rainfall, temperature and evaporation for the area (SA Atlas of Climatology and Agrohydrology - R.E. Schulze, 2009)

Low to no flow in the watercourses in the area is between September and March, with flow mostly occurring from May to August. As can be expected, this resembles the rainfall pattern for the area. The smaller watercourses are likely to only flow for short periods after rainfall events unless they are groundwater (spring) fed.

The catchment of the watercourse is small (approx. 0.95 km^2). The estimated mean annual runoff for the catchment, based on the mean annual precipitation and runoff coefficient for the area, is approx. 120 000 m^3/a. The average flow distribution for the watercourse is shown in the figure below.

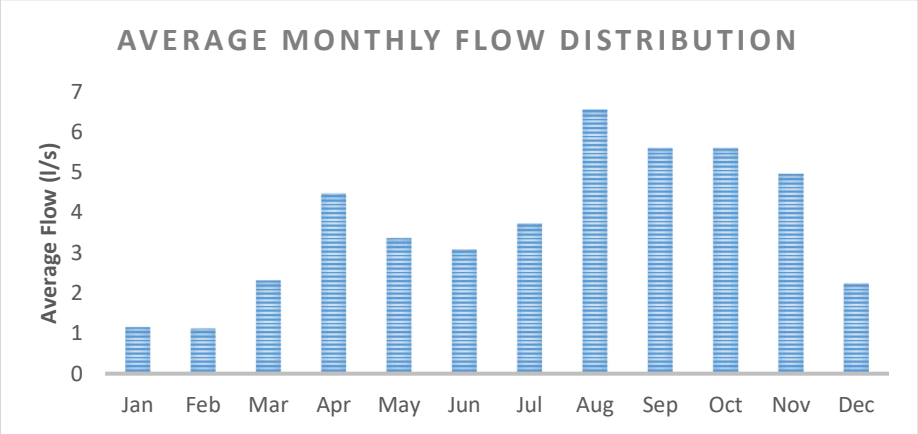

Figure 6. Average monthly flow distribution for the watercourse

According to DWS national groundwater layers, poor fractured aquifer occurs within the area, with the water table typically occurring at depths of about 58 m below ground level and a yield of less than 0.1 litres a second. Due to the underlying geology, both the surface and groundwater quality tends to be relatively saline with natural electrical conductivity concentrations of between 150 and 370 mS/m. The recharge of the aquifer is estimated to be low (about 18 mm/a) and the aquifer is of very low susceptibility and vulnerability to pollution from anthropogenic activities. In the hydrological assessment undertaken by Dr Hattingh for the site (Creo, 2022), the measured groundwater discharge to the watercourse (determined in October 2022) was more than 500 m^3 per month. The measurement was undertaken at the outflow of the lower dam.

The area is not within a Strategic Water Source Area for either surface or groundwater.

4.3 Geology, Soil and Vegetation

The geology on the farm consists of Tertiary terrace gravel overlying shale of the Bokkeveld Group. Up on the hillslopes, sandstone and shale of the Table Mountain Group (Nardouw Subgroup) occur. On the lower slope, mudrock, shale, siltstone, feldspathic arenite and wacke of the Ceres Subgroup of the Bokkeveld Group occur. Shallow stony soils and sandy loams result from the weathered shale and occur together with sandstone cobbles. An outcrop of the underlying sandstone occurs along the lower northern slopes of the Potberg that coincide with a series of springs that feed the surface water systems with good quality water for most, if not all, of the year.

The natural vegetation type mapped as occurring within the area is Potberg Ferricrete Fynbos (Vulnerable), with Potberg Sandstone Fynbos (Least Concern) on the slopes to the south of the site and Cape Lowland Alluvial Vegetation (Endangered) occurring along the watercourses on the valley floor. The tributary in which the dams have been constructed contains a mix of alien and natural riparian vegetation. Invasive alien Acacia spp. such as black wattle (*Acacia mearnsii*), rooikrans (*Acacia cyclops*) and Port Jackson willows (*Acacia saligna*) occur in the more disturbed areas, together with other alien invasives such as thistle (*Cirsium vulgare*) and wild tobacco (*Nicotiana glauca*). Indigenous riparian shrubs include *Searsia lucida, Gymnosporia buxifolia, Osteospermum moniliferum, Morella serrata* while *Phragmites australis, Cyperus textilis* and *Isolepis* spp. dominate the instream habitats.

4.4 AQUATIC ECOSYSTEMS

Aquatic features on the property comprise a minor tributary of the lower Breede River and Estuary. The tributary originates in the foothills of the Potberg downslope of the gravel road to Infanta and flows in a northerly direction through the property. The stream is joined by several other streams before its drains into the Breede Estuary. Valley bottom wetland is mapped along the lower watercourse. Isolated depressions (Soutpan and Varsvlei) are mapped upstream of the gravel road to Infanta.

Figure 7. Orthophotograph taken in 2016 with the river systems associated with the property shown, as well as the location of the dams

4.5. AQUATIC BIODIVERSITY IMPORTANCE

There are three mapping initiatives which are relevant to this study area in terms of demarcating important aquatic biodiversity conservation areas. Provincial Fine-Scale Mapping has produced the 2017 Western Cape Biodiversity Spatial Plan for the wider area. The map aims to guide sustainable development by bringing together biodiversity information for decision-makers so that they can ensure appropriate land use, accommodate important biodiversity features in their planning and promote integrated management of natural resources. Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA) and Critical ESAs (CESA) are considered priority areas which should be maintained in a natural to near-natural state.

The property lies north of the De Hoop Nature Reserve, a formally protected area. The lower river system within the site is mapped primarily as an aquatic CBA, where there is a valley bottom wetland associated with the river (Figure 7). Aquatic ESAs are also mapped along the larger river system and its tributaries, as the watercourses provide important ecological services as aquatic corridors within an increasingly transformed landscape. This area is also mapped as terrestrial CBAs that should not be developed, lost or impacted, as they support critical habitat and species, and appropriate land uses should be low impact and biodiversity sensitive. This aspect has been assessed by the botanical specialist for the project.

The second mapping initiative is the National Freshwater Ecosystem Priority Areas (FEPA) mapping which provides strategic spatial priorities for conserving freshwater ecosystems in South Africa. This mapping serves to identify features such as FEPA wetlands, rivers or estuaries and classifies them based on type (for example: natural or artificial; hillslope seep or valley bottom etc.). The ecological condition of the feature is not dealt with in these maps. Certain river sub-catchments are identified as priority areas due to the importance of the river/aquatic features within the sub-catchment. Sub-catchments classified as River FEPAs are required to be maintained in a largely natural ecological state.

The study area is within a FEPA River Sub-catchment associated with the lower Breede River (Figure 8). The valley bottom wetlands mentioned above as well as the large depression wetlands (Soutpan and Varsvlei) that are upslope of the gravel road and the site are mapped as natural FEPA Wetlands and a Wetland Cluster in the case of the depression wetlands. These wetlands are also mapped within the National Wetland Map version 5 (Figure 9), which is the third mapping initiative that provides a national map of the extent and ecosystem types of the estuarine and inland wetlands.

Figure 8. Western Cape Biodiversity Spatial Plan in the vicinity of the site (CapeFarmMapper, 2023)

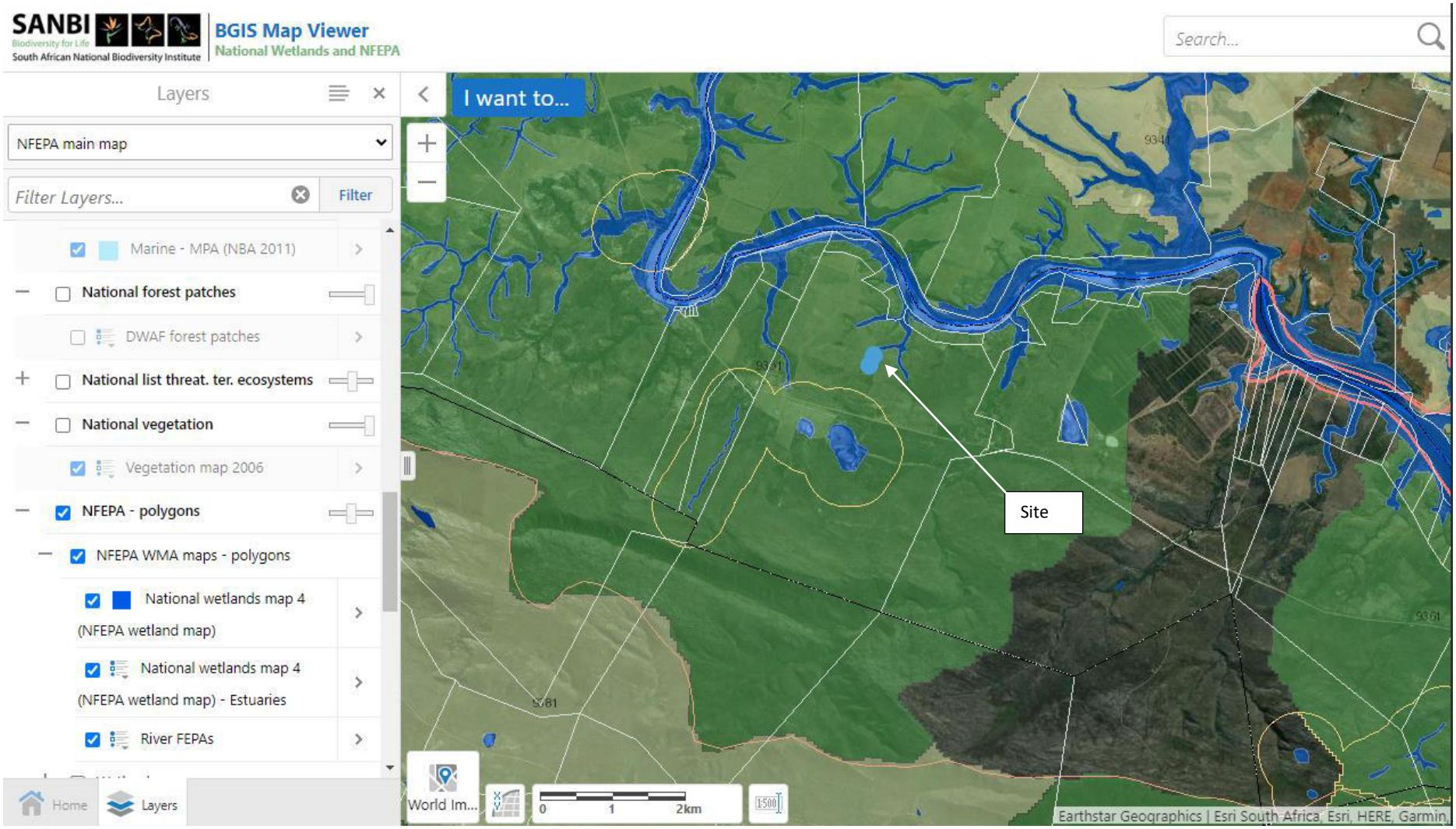

Figure 9. National Freshwater Ecosystem Priority Areas mapping for the dam sites (blue dots) and surrounding area (SANBI Biodiversity GIS, 2023)

Figure 10. FEPA Wetlands and National Wetland Map for the Farm (red polygon) (CapeFarmMapper, 2023))

5. ASSESSMENT OF FRESHWATER FEATURES AND THEIR SIGNIFICANCE

Index for Habitat Integrity (IHI) and Site Characterisation Assessments were utilised to provide information on the ecological condition of the river assessed. No detailed assessments were undertaken in terms of stream geomorphology, fish and aquatic biota. Results of the Site Characterisation Assessment were used to provide a desktop estimate of aquatic habitat integrity.

The tributary in which the dams have been constructed is fed by feeder streams draining the southern, lower slope of the Potberg Mountains. Several small streams drain into the two relatively large depression wetlands upslope of the gravel road to Infanta that do not appear to be linked to the small watercourse in which the dam has been constructed. There is a low ridge immediately downslope of the pans with little to no discernible overflow from the pans to the downslope watercourse. The watercourse is thus largely fed from several small springs located just upstream of the dams. Downstream of the dams, largely a result of the relatively constant discharge of groundwater at the springs, seep and valley bottom wetlands occur.

Historically the stream was likely a perennial stream, fed from groundwater, throughout the year except during very dry periods. Discharge measurements of the spring flow in October 2022 as part of the project assessment (Hatting & Zeeman, 2022), during a relatively dry period, determined the flow from the springs to be in the order of about 18 m^3/day.

The stream flows through agricultural areas where it has been more significantly impacted by past cultivation activities. Much of the valley bottom wetland and riparian vegetation is however still intact but has been invaded with alien vegetation such as rooikrans (*Acacia cyclops*), Port Jackson willows (*Acacia saligna*) and black wattle (*Acacia mearnsii*).

The landowner is currently removing the alien vegetation from the watercourse. Downstream of this, the stream is confined within a valley and is dominated by a valley bottom wetland area that is dominated by *Phragmites australis* reeds with clumps of the mat sedge, *Cyperus textilis*. Vegetation in the dam comprises bulrush (*Typha capensis*), with sedges such as *Cyperus textilis* and *Isolepis prolifera* occurring along the shallow margins.

Figure 11. View of the upper (top) and lower (bottom) dams within the watercourse

Figure 12. View of the watercourse upstream (top), within (middle) and downstream (bottom) of the dams

The earliest available imagery of the site, taken in 1942 (Figure 13), shows the site prior to much activity in the area. Instream wetland habitat extended up to the spring, just upstream of the two dams. It does appear as if there was some disturbance/excavation at or near the two dam sites. Figure 14 shows the site in 1967, cultivation of the flat areas adjacent to the watercourses had all been cultivated. Disturbance at or near the two dam sites is visible. The same cultivation areas are visible in the 2005 image (Figure 15). The disturbance at the two dam sites is not as visible but still appears to still be present. There had also been a significant clearing of wetland habitat in the lower river system.

The Google Earth images shown in Figures 16 and 17 show the site before and after the works were undertaken on the two dams. The surrounding cultivation areas have remained the same however new roads have been constructed to the dams, the area around the dams cleared and the dam basins excavated.

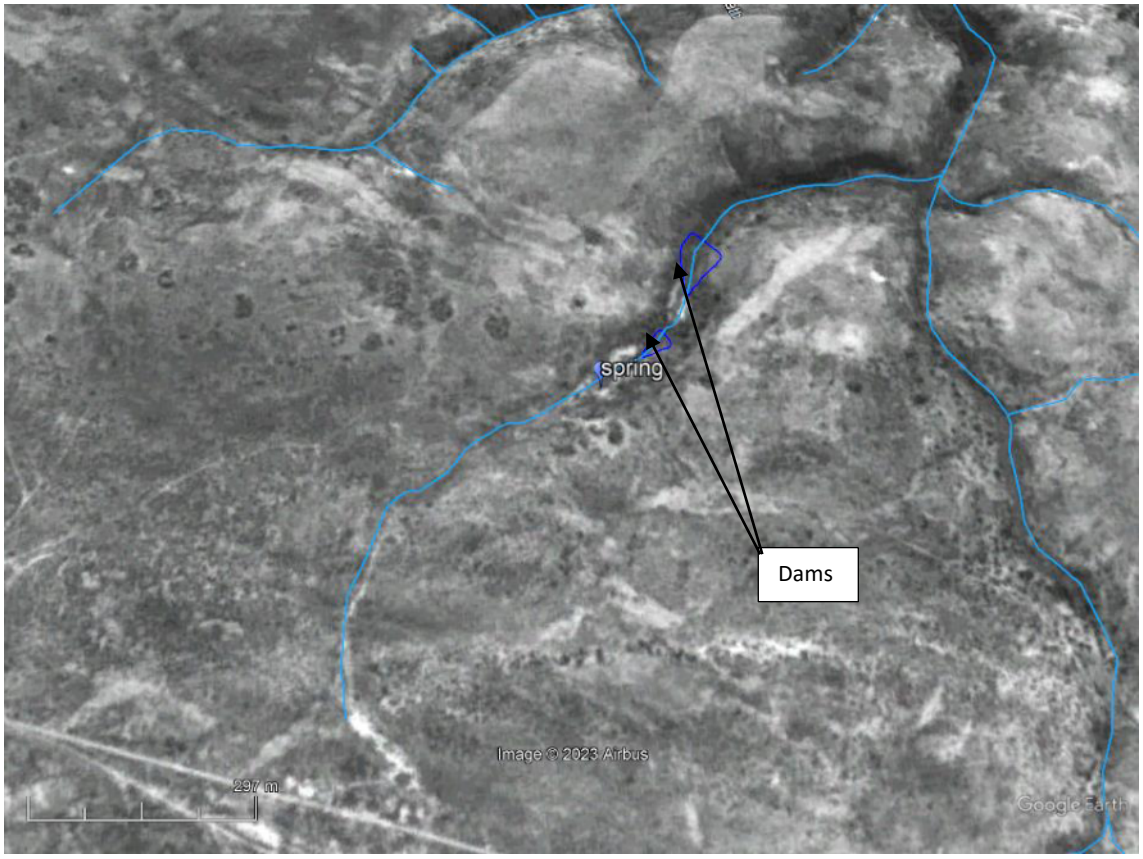

Figure 13. Aerial image taken in 1942 and overlaid in Google Earth with the location of the dams shown

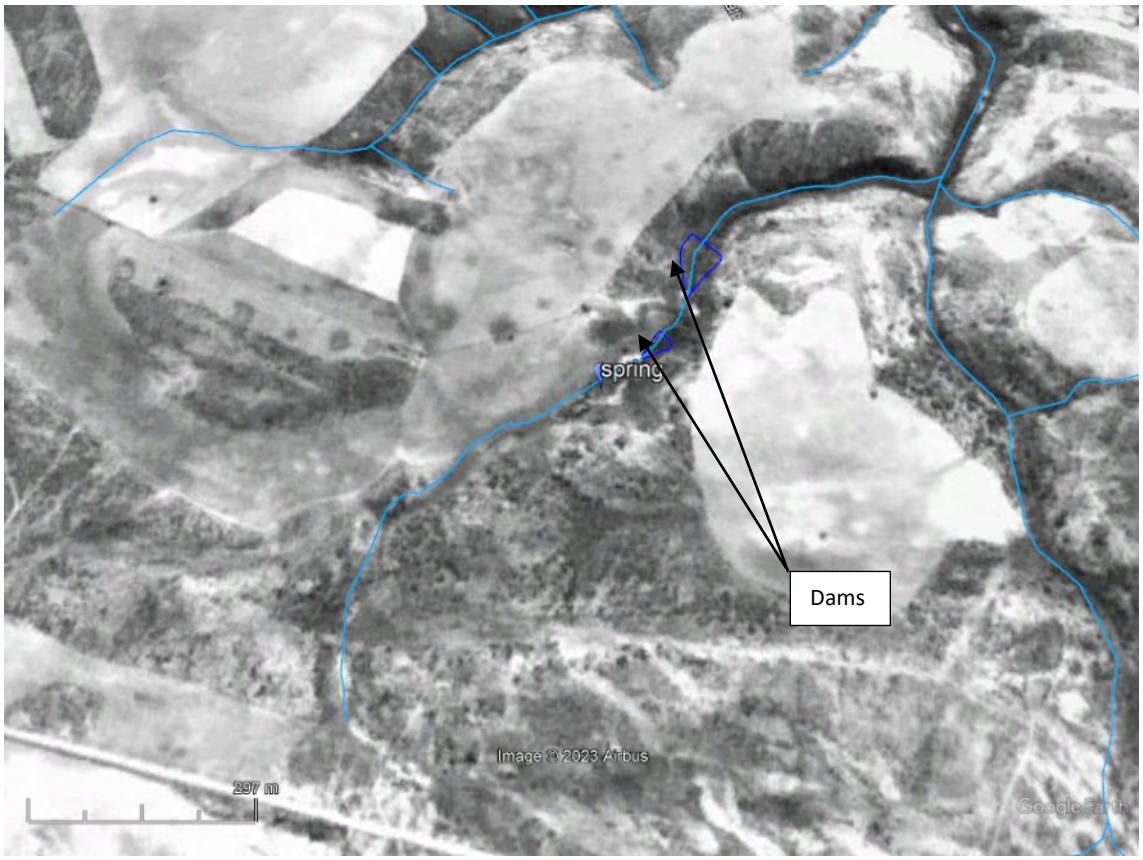

Figure 14. Aerial image taken in 1967 and overlaid in Google Earth with the location of the dams shown

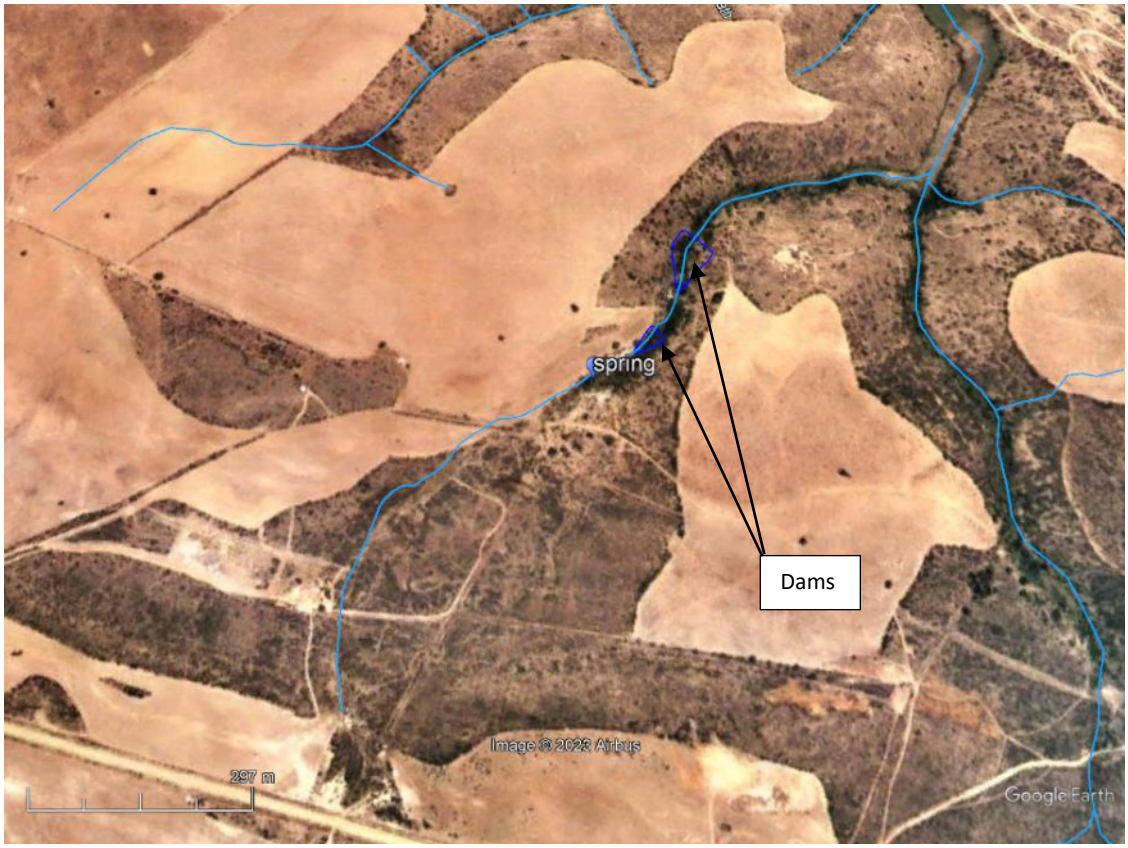

Figure 15. Aerial image taken in 2005 and overlaid in Google Earth with the location of the dams shown

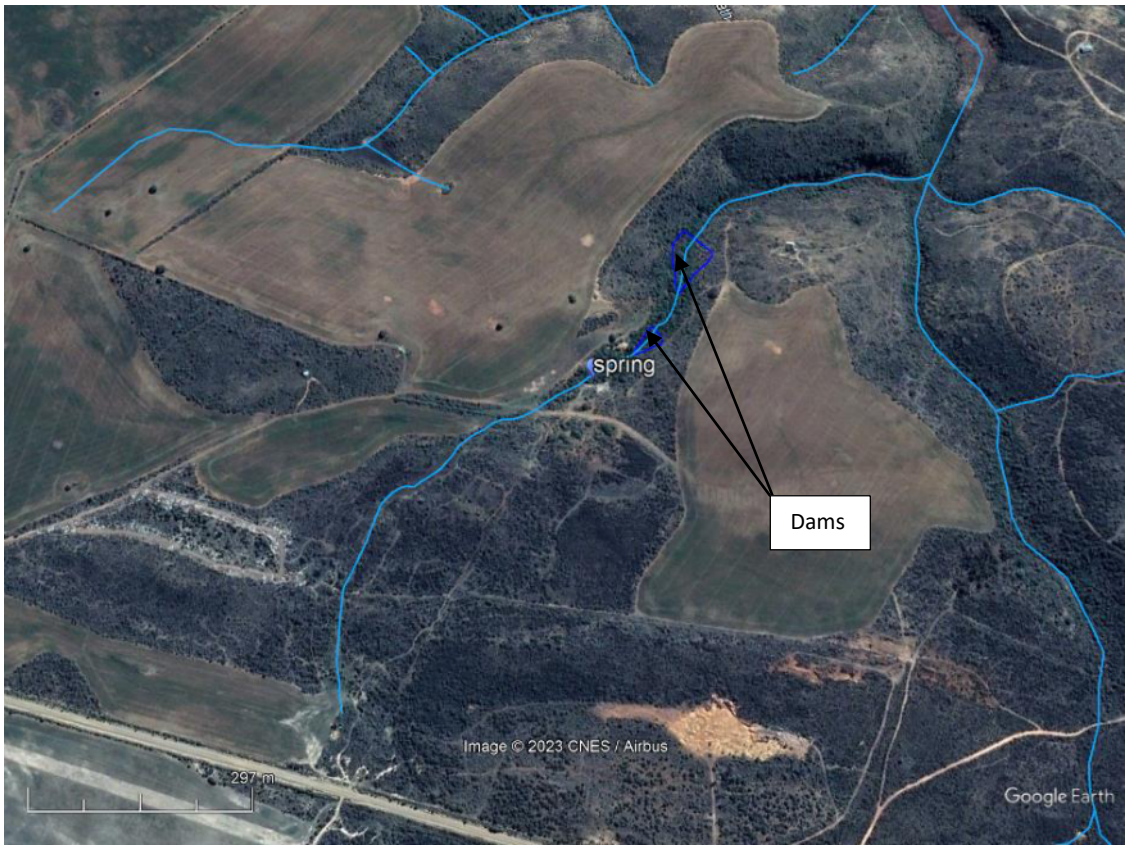

Figure 16. Google Earth image of the site, taken August 2019, with the location of the dams shown

Figure 17. Google Earth image of the site, taken March 2021, with the location of the dams shown

5.1. RIVER CLASSIFICATION

In order to assess the condition and ecological importance and sensitivity of the river, it is necessary to understand how the watercourse might have appeared under unimpacted conditions. This is achieved by classifying rivers according to their ecological characteristics, in order that they can be compared to ecologically similar rivers.

River typing or classification involves the hierarchical grouping of rivers into ecologically similar units so that inter- and intra-river variation in factors that influence water chemistry, channel type, substratum composition and hydrology are best accounted for. Any comparative assessment of river condition should only be done between rivers that share similar physical and biological characteristics under natural conditions. Thus, the classification of rivers provides the basis for assessing river condition to allow comparison between similar river types. The primary classification of rivers is a division into Ecoregions. Rivers within an Ecoregion are further divided into sub-regions.

Ecoregions: groups of rivers within South Africa, which share similar physiography, climate, geology, soils and potential natural vegetation. For the purposes of this study, the ecoregional classification presented in DWAF (1999), which divides the country's rivers into ecoregions, was used.

Sub-regions: sub-regions (or geomorphological zones) are groups of rivers, or segments of rivers, within an Ecoregion, which share similar geomorphological features, of which gradient is the most important. The use of geomorphological features is based on the assumption that these are a major factor in the determination of the distribution of the biota.

Table 2: Characteristics of the Southern Folded Mountains Ecoregion

Main Attributes	Characteristics (dominant types in bold)
Terrain Morphology	Lowlands; Hills and Mountains; Moderate and High Relief; Open Hills; Lowlands; Mountains; Moderate to High Relief; **Closed Hills; Mountains; Moderate and High Relief**
Vegetation types	Patches Afromontane Forest; Spekboom Succulent Thicket; **Little Succulent Karoo;** **Grassy Fynbos; Mountain Fynbos;** South and South West Coast Renosterveld; Central Mountain Renosterveld; Eastern Mixed Nama Karoo; Central Nama Karoo; Great Nama Karoo;
MAP (mm) (modify)	200 to 1500
Rainfall seasonality	Very late summer to winter to all year
Mean annual temp. (°C)	10 to 20
Median annual simulated runoff (mm) for quaternary catchment	<5 to >250

5.2. SITE CHARACTERISATION

From the Site Characterisation assessment, the geomorphological and physical characteristics of the tributary that was assessed can be classified together as follows:

Table 3: Geomorphological and Physical features

River	Tributary of the Breede River at the site
Valley Form	Lower foothill
Lateral mobility or entrenchment	Relatively confined by topography
Channel form	Simple
Channel pattern	Moderate to low sinuosity
Channel type	Sandy/gravel bed
Hydrology	Perennial to non-perennial

5.3. INDEX OF HABITAT INTEGRITY

Evaluation of Index of Habitat Integrity (IHI) provides a measure of the degree to which a river has been modified from its natural state. This assessment was undertaken for the watercourse at the site. The results are provided in Table 5.

The methodology (DWAF, 1999) involves a qualitative assessment of the number and severity of anthropogenic perturbations on a river and the damage they potentially inflict upon the system. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of the degradation of a river. The severity of each impact is ranked using a scale from 0 (no impact) to 25 (critical impact). The IHI assessment is based on an evaluation of the impacts of two components of the river, the riparian zone and the instream habitat. Assessments are made separately for both

components, but data for the riparian zone are interpreted primarily in terms of the potential impact on the instream component. The total scores for the instream and riparian zone components are then used to place the habitat integrity of both in a specific habitat category (Table 4).

Table 4: Habitat Integrity categories (From DWAF, 1999)

CATEGORY	DESCRIPTION	SCORE (% OF TOTAL)
A	Unmodified, natural.	90-100
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-90
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	40-59
E	The loss of natural habitat, biota and basic ecosystem functions is extensive.	20-39
F	Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In worst instances, basic ecosystem functions have been destroyed and changes are irreversible.	0

The instream and riparian habitat integrity of the stream are considered to be moderately modified. This is due to the impact of the invasion of alien vegetation in the riparian zone as well as the flow and habitat modification associated with the dams. The results are summarised in Table 5.

Table 5: Index of Habitat Integrity Assessment results and criteria assessed

INSTREAM HABITAT INTEGRITY	Score	RIPARIAN ZONE HABITAT INTEGRITY	Score
Water Abstraction	8	Vegetation Removal	8
Flow Modification	10	Exotic Vegetation	11
Bed Modification	7	Bank Erosion	6
Channel Modification	5	Channel Modification	5
Water Quality	5	Water Abstraction	7
Inundation	8	Inundation	8
Exotic Macrophytes	5	Flow Modification	10
Exotic Fauna	0	Water Quality	5
Rubbish Dumping	1		
INTEGRITY CLASS	**C**	**INTEGRITY CLASS**	**C**

5.4. Ecological Importance and Sensitivity (EIS)

The EIS assessment considers a number of biotic and habitat determinants surmised 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 (EISC).

Table 6: Scale used to assess biotic and habitat determinants indicating either importance or sensitivity

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 a National scale (i.e. SA Red Data Books)

Table 7: Ecological importance and sensitivity categories (DWAF, 1999)

EISC	General description	median
Very high	Quaternaries/delineations that are considered to be unique on a national and international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3-4
High	Quaternaries/delineations that are 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 that are 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 8: Results of the EIS assessment for the watercourse assessed

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

The watercourse is considered of moderate ecological importance and sensitivity. The wetland habitat associated with the watercourse is sensitive to flow and water quality modification. The watercourse is also providing a link between the pan features on the foot of the Potberg as well as the De Hoop Nature Reserve. The habitat is also likely to provide refuge to amphibians such as the clicking stream frog (*Strongylopus grayii*), Cape river frog (*Amietia fuscigula*), painted reed frog (*Hyperolius marmoratus*), southern dainty frog (*Cacosternum australis*) and raucous toad (*Sclerophrys capensis*). All of these species are listed as being of 'Least Concern' on the IUCN Red List of Threatened Species. It is unlikely that any fish species are present in the watercourse. Bird species such as cormorants (*Microcarbo africanus*), grey herons (*Ardea cinerea*), dabchicks (*Tachybaptus ruficollis*), and red bishops (*Euplectes orix*) were observed in the bulrushes on the dams.

5.5. Recommended Ecological Management Category

In terms of the proposed water resource classes for the Breede Gouritz Water Management Area, the Target Ecological Category for the downstream Breede River Estuary in DWS quaternary catchment

H70H is a B category within a Class II (moderate protection and utilisation) integrated unit of analysis area (Lower Breede Renosterveld). The recommended ecological condition of the watercourse at the site is that it is maintained within the ecological category of B/C (largely natural/moderately modified). This could be achieved by removing the invasive alien vegetation within the corridor and ensuring the environmental flow requirements of the downstream aquatic ecosystem are maintained.

5.6. Environmental Water Requirements

The watercourse in which the dams have been constructed is fed from surface water runoff as well as groundwater. The estimated runoff of the catchment is about 120 000 m^3/a with a groundwater contribution of more than 500 m^3/month. Given the high variability and uncertainty in the runoff, it is recommended that the environmental water requirement is rather expressed as a percentage of the flow where at least 25% of the flow entering the dams is allowed to continue downstream to feed the downstream wetland areas.

6. LEGISLATIVE AND CONSERVATION PLANNING REQUIREMENTS

The proposed activity needs to take cognisance of legislative requirements, policies, strategies, guidelines and principles from a municipal to a national level. Nationally, two sets of legislation are important to the proposed activity from a freshwater resource perspective. These are the National Environmental Management Act (NEMA) and the National Water Act (NWA).

6.1 NEMA and Environmental Impact Assessment Regulations

NEMA is the overarching piece of legislation for environmental management in South Africa and includes provisions that must be considered to give effect to the general objective of integrated environmental management. These provisions are contained in Section 24 (4) (a)(b) of the Act and will be considered during the EIA process. Activities listed in terms of chapter 5 of NEMA in Government Notice No. R.983, 984, and 985, dated 4 December 2014, as amended, trigger a mandatory Basic Assessment, or even a full scoping EIA process, before development. Since the works at the site have already taken place, a Section 24G process is being undertaken.

6.2 National Water Act, 1998 (Act No. 36 of 1998)

The purpose of the National Water Act, 1998 (NWA) is to provide a framework for the equitable allocation and sustainable management of water resources. Both surface and groundwater sources

are redefined by the Act as national resources which cannot be owned by an individual and rights which are not automatically coupled to land rights, but prospective users must apply for authorisation and register as users. The NWA also provides measures to prevent, control and remedy pollution of surface and groundwater sources.

The Act aims to regulate the use of water and activities (as defined in Part 4, Section 21 of the NWA), which may impact water resources through the categorisation of 'listed water uses' encompassing water abstraction and flow attenuation within catchments as well as the potential contamination of water resources, where Department of Water and Sanitation (DWS), is the administering body in this regard. Defined water use activities require the approval of DWS / BGCMA in the form of a General Authorisation or Water Use Licence authorisation. There are restrictions on the extent and scale of listed activities for which General Authorisations apply.

The works undertaken at the site relate to Section 21 (b) – storage of water; Section 21 (c) – diverting or impeding flow in a watercourse; and Section 21 (i) – changing the bed, banks, course or characteristics of watercourse water uses that could be considered existing lawful use or adequately dealt with under the approved MMP for the river.

Section 22 (3) of the NWA allows for a responsible authority (DWS) to dispense with the requirement for a Water Use License if it is satisfied that the purpose of the Act will be met by the grant of a licence, permit or authorisation under any other Law.

6.2.1. General Authorisation in terms of Section 39 of the NWA

The proposed works within and adjacent to the rivers, streams and wetland areas are deemed to be changing the characteristics of the associated freshwater ecosystems as well as impeding flow in the watercourses and therefore require authorisation. The authorisation of water use activities for Sections 21 (c) - change to the bed, banks and characteristics of a watercourse and 21 (i)- impeding and diverting the flow, will need to be applied for. According to the preamble to Part 6 of the NWA, "*This Part established a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette…*" *"The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary…"*

The General Authorisations for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA have recently been revised (Government Notice R509 of 2016). Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of the General Authorisations (GA).

A risk assessment (for Section 21(c) and (i) water uses only) has been undertaken to inform the water use authorisation process if required and is included for information purposes in this freshwater impact assessment report.

6.2.2. Regulations Requiring that a Water Use be Registered, GN R. 1352 (1999)

Regulations requiring the registration of water users were promulgated by the minister of DWS in terms of the provision made in Section 26 (1)(c), read together with Section 69 of the NWA, 1998. Section 26 (1)(c) of the Act allows for registration of all water uses, including existing lawful water use, in terms of Section 34(2). Section 29(1)(b)(vi) also states that in the case of a general authorisation, the responsible authority may attach a condition requiring the registration of such water use. The regulations (Art. 3) oblige any water user, as defined under Section 21 of the Act, to register such use with the responsible authority and effectively apply for a Registration Certificate as contemplated under Art. 7(1) of the Regulations.

7. IMPACT ASSESSMENT AND REHABILITATION RECOMMENDATIONS

The works undertaken within and adjacent to the watercourse (expansion of two instream dams) have been assessed in this section in terms of the potential aquatic ecosystem impacts. Additional buildings have also been constructed within the propery however these lie on the hill tops and more than 80m from the watercourses and are thus deemed to have had no impact on the aquatic features.

The aquatic ecosystem assessment in Section 5.3 determined the river to be moderately modified and of moderate ecological importance and sensitivity with a target ecological condition of largely natural to moderately modified. This is largely due to the disturbance and loss of riparian vegetation along the watercourse and its replacement with alien vegetation. Removal of alien vegetation removal along the riverbanks is being undertaken and can be expected to improve the ecological integrity of the river over the long term.

The potential impact of the constructed dams on the tributary of the Breede Estuary is considered from an aquatic ecological perspective in this report. Past imagery for the farm indicates that the tributary at the dam sites has long been disturbed. The recent works have taken place within these already disturbed areas and thus have not resulted in any further degradation of the river system.

The following findings and recommendations are thus given:

- The dams appear to have been constructed within the watercourse prior to 1940 but were not maintained for a long period until 2019/2020.
- The dams have also not resulted in any significant impact on the flow in the associated watercourse. The catchment of the dam is less than 0.95 km^2 and generates a runoff of approx. 120 000 m^3. The dams have a combined storage of less than 10 000 m^3 and thus do not impact significantly on the medium to high flows. There is also an approx. 300 – 400 mm outlet pipe in the dam wall that allows a constant release into the downstream watercourse during low flow conditions, with a second one at a slightly higher level that allows for further downstream flow releases in higher flow conditions.

- It is also preferred that water be obtained from the surface water and out of the dams than drawing down the groundwater table through the abstraction of a borehole in the area. The contact springs on the property and surrounding areas are essential in supporting many groundwater-dependent ecosystems.
- The dams need not be removed but should be mitigated by implementing aquatic ecosystem-related mitigation measures as outlined below. A programme should be put in place to remove the invasive alien trees along the riverbanks in this area. The main invasive alien vegetation currently occurring within the disturbed areas on the farm include Port Jackson willows (*Acacia saligna*), rooikrans (*Acacia cyclops*), black wattle (*Acacia mearnsii*), thistle (*Cirsium vulgare*) and wild tobacco (*Nicotiana glauca*).
- Indigenous vegetation observed along the watercourse that is suitable for revegetation of cleared riparian areas comprises *Searsia lucida, Gymnosporia buxifolia, Osteospermum moniliferum, Morella serrata, Ficinia nodosa, Cyprus textilis* and *Isolepis prolifera*.
- At least 25% of the flow in the watercourse that enters the dams should be allowed to continue downstream. This downstream flow requirement is important to maintain the downstream wetlands that provide habitat for amphibians and birdlife. The downstream flow requirement should largely be achieved passively by not drawing down the water level in the dam such that it drops below the lower culvert in the dam wall. The culverts should also be kept open and not blocked.
- Monitoring of the flow from the culverts in the lower dam wall should be recorded, as well as abstraction from the dam.
- It is recommended that there is an approved Maintenance Management Plan in place for the farm that would guide any maintenance activities undertaken in the watercourses.

Table 9. Impact table for the works undertaken

Construction Phase	
Potential impact and risk	Disturbance/modification of aquatic habitat as well as flow impacts
Nature	Negative
Extent and duration	Local Extent and long term
Consequence	Limited aquatic habitat modification at the dam and downstream
Probability	Probable
Confidence	High
Irreplaceability	Marginal loss
Reversibility	Partially Reversible
Indirect impacts	Potential water quality and hydraulics impacts
Cumulative impacts before mitigation	Medium to Low negative
Significance of impact before mitigation	Medium to Low negative
Degree impact can be avoided	Medium
Degree impact can be managed	Medium to high
Degree impact can be mitigated	Medium to high
Mitigation	As listed above
Residual impacts	Slightly modified aquatic habitat
Cumulative impacts after mitigation	Low
Significance of impact after mitigation	Low negative

Operation Phase	
Potential impact and risk	Opportunity to improve function and habitat through the proposed mitigation measures
Nature	Negative with potential for positive impacts
Extent and duration	Site and long term
Consequence	Low
Probability	Possible
Confidence	High
Irreplaceability	Marginal loss
Reversibility	Partially Reversible
Indirect impacts	Growth of alien invasive plants in the riparian zone and loss of downstream aquatic habitat
Cumulative impacts before mitigation	Low negative
Significance of impact before mitigation	Low negative
Degree impact can be avoided	Medium
Degree impact can be managed	High
Degree impact can be mitigated	High
Mitigation	• Control of invasive alien vegetation • Ensure downstream flow requirements are met. • It is recommended that there is an approved Maintenance Management Plan in place for the farm
Residual impacts	None
Cumulative impacts after mitigation	Negligible
Significance of impact after mitigation	Negligible

8. RISK ASSESSMENT

A risk assessment was carried out for the activity undertaken. The full risk assessment matrix can be seen in Appendix C. The risk rating, (where Low (L) risk has a significance score of 1-55 and Moderate risk (M) has a score of 56-169) is considered to be Moderate. The higher risk score is largely a result of the downstream wetland habitats and the need to ensure an environmental flow is released from the dam to maintain this habitat. A water use application will also need to be submitted for the associated Section 21 (c) and (i) water use activities as well as for the storage and abstraction of water in the dam (Section 21 (a) and (b)).

Table 10. Risk assessments for the activity under consideration

Phases	Activity	Aspect	Impact	Significance	Risk Rating
Construction	Construction works adjacent to aquatic habitats associated with the watercourse within the site	Works at the two dams	Aquatic habitat modification; potential flow/hydraulic modification	120	M
		Construction of access roads to dams		99	M
Operation	Operational activities associated with the infrastructure in and adjacent to the watercourse	Operation and Maintenance works in the watercourse		88	M

9. CONCLUSIONS AND RECOMMENDATIONS

Aquatic features on the property comprise a tributary of the Breede River Estuary. Valley bottom wetland occurs below the spring and dams. The habitat integrity of the watercourse is considered to be moderately modified and of moderate ecological importance and sensitivity. The recommended ecological condition of the Boskloof River is that it is maintained within the ecological category of B/C (largely natural to moderately modified).

The works undertaken within and adjacent to the watercourse (expansion of two instream dams) have been assessed in this report in terms of the potential aquatic ecosystem impacts. Additional buildings have also been constructed within the propery however these lie on the hill tops and more than 80m from the watercourses and are thus deemed to have had no impact on the aquatic features.

Past imagery for the farm indicates that the watercourse at the two dams has long been disturbed and that the two dams were in existence prior to 2019 but had not been maintained. Similarly, the removal of the indigenous riparian vegetation and replacement with alien trees took place a long time ago. The recent works did however result in further clearing of the area and the creation of two access roads.

The dams have not resulted in any significant impact on the flow in the associated watercourse. The dams need not be removed but should be mitigated by implementing aquatic ecosystem-related mitigation and rehabilitation measures such as clearing invasive alien plants from the riparian zones and revegetating where necessary with suitable indigenous vegetation.

The dams are small and do not impact significantly on the medium to high flows. There are also culverts in the dam wall that allow a constant release into the downstream watercourse during low flow conditions. It is preferred that water be obtained from the surface water than drawing down the groundwater table through the abstraction of a borehole in the area. The contact springs on the property and surrounding areas are essential in supporting many groundwater-dependent ecosystems.

At least 25% of the flow in the watercourse that enters the dams should be allowed to continue downstream. This downstream flow requirement is important to maintain the downstream wetlands that provide habitat for amphibians and birdlife. The downstream flow requirement should largely be achieved passively by not drawing down the water level in the dam such that it drops below the lower culvert in the dam wall. The culverts should also be kept open and not blocked. Monitoring of the flow from the culverts in the lower dam wall should be recorded, as well as abstraction from the dam. It is recommended that there is an approved Maintenance Management Plan in place for the farm that would guide any maintenance activities undertaken in the watercourses.

Given the above findings, there is no reason why the constructed dam and garden can not be retained. The risk rating is considered to be Moderate. A water use application will be submitted for the associated water use as well as for the storage of water in the dam.

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APPENDIX A: FRESHWATER IMPACT ASSESSMENT METHODOLOGY

These criteria are drawn from the EIA Regulations published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the latest basic assessment report template provided by the Department of Environmental Affairs and Development Planning (DEA&DP) and the DEA&DP Guidelines for involving Biodiversity Specialists in EIA Processes, 2005. These criteria include:

Nature of the impact: This is an appraisal of the type of effect (positive or negative) the construction, operation and maintenance of development would have on the affected environment. This description should include what is to be affected.

Extent of the impact: Extent defines the physical extent or spatial scale of the impact. The impact could:

- **Site-specific:** limited to the site.
- **Local:** limited to the site and the immediate surrounding area (1-10km)
- **Regional:** covers an area that includes an entire geographic region or extends beyond one region to another.
- **National:** across national boundaries and may have national implications.

Duration of the impact: The specialist should indicate whether the lifespan of the impact would be:

- **Short term:** 0-5 years.
- **Medium-term:** 5-15 years.
- **Long term:** beyond the operational phase, but not permanently).
- **Permanent:** where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.

Consequence of Impact: Indicate how the activity will affect the environment.

Probability of occurrence: Probability describes the likelihood of the impact occurring. The likelihood can be described as:

- **Improbable/unlikely:** low likelihood of the impact occurring.
- **Probable:** distinct possibility the impact will occur.
- **Highly probable:** most likely that the impact will occur.
- **Definite:** impact will occur regardless of any prevention measures.

Irreplaceable loss of resources: Describes the degree to which resources will be irreplaceably lost due to the proposed activity. It can be **no loss of resources**, **marginal loss**, **significant loss** or **complete loss of resources**.

Reversibility: This refers to the degree to which an impact can be reversed.

- **Fully reversible:** where the impact can be completely reversed.
- **Partly reversible:** where the impact can be partially reversed.
- **Irreversible:** where the impact is permanent.

Indirect impacts: Indirect impacts are secondary impacts and usually occur at a different place or time. Specialists will need to elaborate on any indirect or secondary impacts of proposed activities. If there are no indirect impacts specialist will need to briefly explain so.

Cumulative impact: An effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. Cumulative impacts before and post-mitigation must be assessed. The cumulative effect can be:

- **Negligible:** the impact would result in negligible to no cumulative effect.
- **Low:** the impact would result in insignificant cumulative effects.
- **Medium:** the impact would result in minor cumulative effects.
- **High:** the impact would result in significant cumulative effects.

Significance rating of impacts before and after mitigation: Based on a synthesis of the information contained in the above-described procedure, the significance of the potential impacts must be assessed using the following significance criteria:

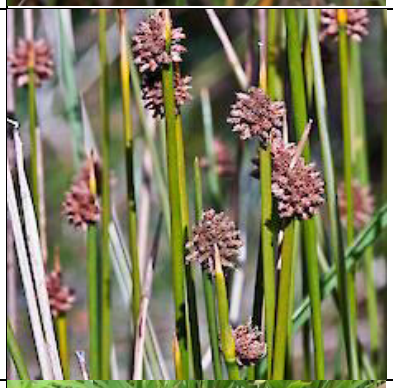
- **No impact.**
- **Low negative:** where it would have negligible effects and would require little or no mitigation.
- **Low positive:** the impact will have minor positive effects.
- **Medium negative:** the impact will have moderate negative effects and will require moderate mitigation.
- **Medium positive:** the impact will have moderate positive effects.
- **High negative:** the impact will have significant effects and will require significant mitigation measures to achieve an accepted level of impact.
- **High positive:** the impact will have significant positive effects.
- **Very high negative:** the impact will have highly significant effects and are unlikely to be able to be mitigated adequately.
- **High positive:** the impact will have highly significant positive effects.

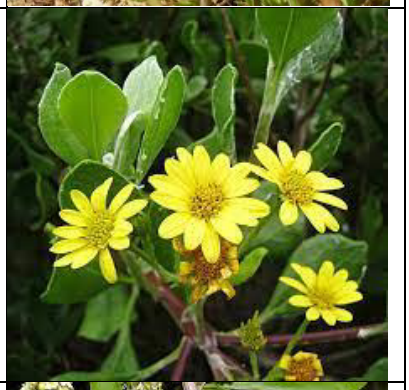
Degree to which impact can be avoided: This indicates the degree to which an impact can be avoided. The degree of avoidance can either be **high** (impact is completely avoidable), **moderate** (impact is avoidable with moderate mitigation), **low** (the impact is difficult to avoid and will require significant mitigation measures) or **unavoidable** (the impact is cannot be avoided even with significant mitigation measures). Can the impact be avoided and if so, how can it be avoided (example: demarcation of no-go areas).

Degree to which impact can be managed: This indicates the degree to which an impact can be managed. The degree of management can either be **high** (impact is completely manageable), **moderate** (impact is manageable with moderate mitigation), **low** (the impact is difficult to manage and will require significant mitigation measures) or **unmanageable** (the impact is cannot be managed even with significant mitigation measures). How can the impact be managed over time (example: clearance of alien vegetation).

Degree to which an impact can be mitigated: This indicates the degree to which an impact can be reduced. The degree of mitigation can either be **high** (the impact can be **fully** mitigated), **moderate** (the impact can be **partly mitigated**) or **not mitigated at all**. Residual impacts

APPENDIX B: INDIGENOUS VEGETATION RECOMMENDED FOR REVEGETATION

Species	Common name/s	Zone	
Fuirena hirsuta	Sedge	Lower wet bank	
Ficinia nodosa	Knob club rush	Lower wet bank	
Cyprus textilis	Mat sedge	Lower wet bank	
Isolepis marginata	Course club-rush	Lower wet bank	
Isolepis prolifera	Vleigras	Lower wet bank and into aquatic	

Cotula coronopifolia	Brass buttons	Lower wet bank and into aquatic	
Osteospermum moniliferum	Bietou	riparian zone	
Gymnosporia buxifolia	Common spikethorn	riparian zone	
Morella serrata	Lance-leaved waxberry	riparian zone	
Searsia lucida	kuni-rhus (English) blinktaaibos (Afrikaans	riparian zone	

APPENDIX C: RISK ASSESSMENT

ASPECTS AND IMPACT REGISTER/RISK ASSSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS,DRAINAGE LINES: WORKS UNDERTAKEN ON REM OF PTN 1 MELKHOUTRIVIER 492, MALGAS
COMPILED BY: Toni Belcher (SACNASP No 400040/10)
DATE: June 2023

					Severity																
Nr.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph +Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Confidence	Type Watercourse; PES; EIS
1	Construction	Construction works adjacent to aquatic habitats associated with the watercourse	Works at the two dams	Aquatic habitat modification; potential flow/hydraulic modification	5	5	5	5	5	1	4	**10**	1	3	5	3	**12**	**120**	**M**	A programme should be put in place to remove the invasive alien trees along the riverbanks in this area. The main invasive alien vegetation currently occurring within the disturbed areas on the farm include Port Jackson willows (Acacia saligna), rooikrans (Acacia cyclops), black wattle (Acacia mearnsii), thistle (Cirsium vulgare) and wild tobacco (Nicotiana glauca). •Indigenous vegetation observed along the watercourse that is suitable for revegetation of cleared riparian areas comprises Searsia lucida, Gymnosporia buxifolia, Osteospermum moniliferum, Morella serrata, Ficinia nodosa, Cyprus textilis and Isolepis prolifera. •At least 25% of the flow in the watercourse that enters the dams should be allowed to continue downstream. This downstream flow requirement is important to maintain the downstream wetlands that provide habitat for amphibian and birdlife. The downstream flow requirement should largely be achieved passively by not drawing down the water level in the dam such that it drops below the lower culvert in the dam wall. The culverts should also be kept open and not blocked. •Monitoring of the flow from the culverts in the lower dam wall should be recorded, as well as abstraction from the dam. •It is recommended that there is an approved Maintenance Management Plan in place for the farm that would guide any maintenance activities undertaken in the watercourses.		
			Construction of access roads to dams		5	5	5	5	5	1	3	**9**	1	2	5	3	**11**	**99**	**M**		High	Tributary and associated wetland areas of the Breede Estuary within the property; PES= C; EIS=Moderate
	Operation	Operational activities associated with the infrastructure in and adjacent to the watercourse	Operation and Maintenance works in the watercourse		5	5	5	5	5	1	2	**8**	1	2	5	3	**11**	**88**	**M**		Med/High	

Communication with Freshwater Consultant re 2 cottages and Parking/ utility building

amanda@phsconsulting.co.za

From: Toni <toni@bluescience.co.za>
Sent: Thursday, 21 August 2025 12:59
To: amanda@phsconsulting.co.za
Subject: RE: Melkhoutrivier - landowner cottages area

Thanks a buffer of 20m with indigenous vegetation should suffice for that small watercourse and my assessment would not change.

Kind regards
Toni

_____
Antonia Belcher ***Pr.Sci.Nat***
Aquatic Scientist
Cell: +27(0)82 883 8055

Toni Belcher
Aquatic Ecologist

From: amanda@phsconsulting.co.za <amanda@phsconsulting.co.za>
Sent: Thursday, 21 August 2025 12:55 PM
To: 'Toni' <toni@bluescience.co.za>
Subject: RE: Melkhoutrivier - landowner cottages area

Hi Toni
Paul measured it on site as approximately 22m from the drainage line to the start of the cottage.

Best wishes
Amanda

From: Toni <toni@bluescience.co.za>
Sent: Thursday, 21 August 2025 11:08
To: amanda@phsconsulting.co.za
Subject: RE: Melkhoutrivier - landowner cottages area

Hi Amanda
Do you know how for from the watercourse? It is a minor feature and they have left a buffer of indigenous vegetation so I would guess it should not alter my findings.

Kind regards
Toni

_____
Antonia Belcher ***Pr.Sci.Nat***
Aquatic Scientist
Cell: +27(0)82 883 8055

Toni Belcher
Aquatic Ecologist

From: amanda@phsconsulting.co.za <amanda@phsconsulting.co.za>
Sent: Thursday, 21 August 2025 10:57 AM
To: toni@bluescience.co.za
Subject: Melkhoutrivier - landowner cottages area

Good morning Toni

Hope you are well

During a recent site visit we obtained more detail on the cottages area.
There are two cottages of 150m2 (deck area included) and a parking / utility building of 160m2 with a total area cleared around these of 2700m2.

The clearance and buildings do not show clearly on Google Earth, but the below image is from CFM and indicates the clearance. The most easterly cottage is approximately 60m2 within 32m of the drainage line.

Please can you have a look at this and indicate whether this would influence the findings of your report and impact ratings (see your previous report attached).

We are including Activity 14 Listing 3 in our report.

Please let me know if you need additional information.

Best wishes
Amanda