WATER USE LICENCE APPLICATION SUMMARY REPORT

NAME OF APPLICANT:

Familie Roux Eiendomme (Pty) Ltd
WU34534

Compiled by

Confluent Environmental (Pty) Ltd

Author: Sonia Jordaan
Reviewed: Dr. Jackie Dabrowski
Updated: February 2025

1. Applicant details

Name of applicant: Familie Roux Eiendomme (Pty) Ltd
Postal address: 215 Soutpansbergweg, Rietondale, Pretoria, 0084
Cell phone number: +27 84 515 1055
E-mail address: sroux@worldonline.co.za

2. Person submitting the application

Jackie Dabrowski (Ph.D., Pr.Sci.Nat. Aquatic Science)
The South African Council for Natural Scientific Professions (SACNASP)
Registration Number 11516
Date of registration 27 January 2016

3. Background and purpose

3.1 Background

The applicant, Familie Roux Eiendomme (Pty) Ltd, hereafter referred to as the developer is applying for a Water Use License (WUL) in terms of the National Water Act (NWA; Act 36 of 1998), to build a residential development in Keurboomstrand, Plettenberg Bay, Western Cape. The proposed housing development will be on Portion 91 of Farm Matjes Fontein 304, of ±5.28 ha in extent on the farm portion which measures a total area of 14.7 hectares. Lower lying areas of the property are located partially in the mapped Estuarine Functional Zone (EFZ) of the Keurbooms Estuary (Figure 1). However, after a site visit and extensive ground-truthing by the aquatic specialist (J. Dabrowski, Confluent) it was established that although the site is located within the mapped EFZ area, based on contours alone, there are no features on the site itself associated with anything related to an estuary (Aquatic specialist report, Confluent, Appendix 1).

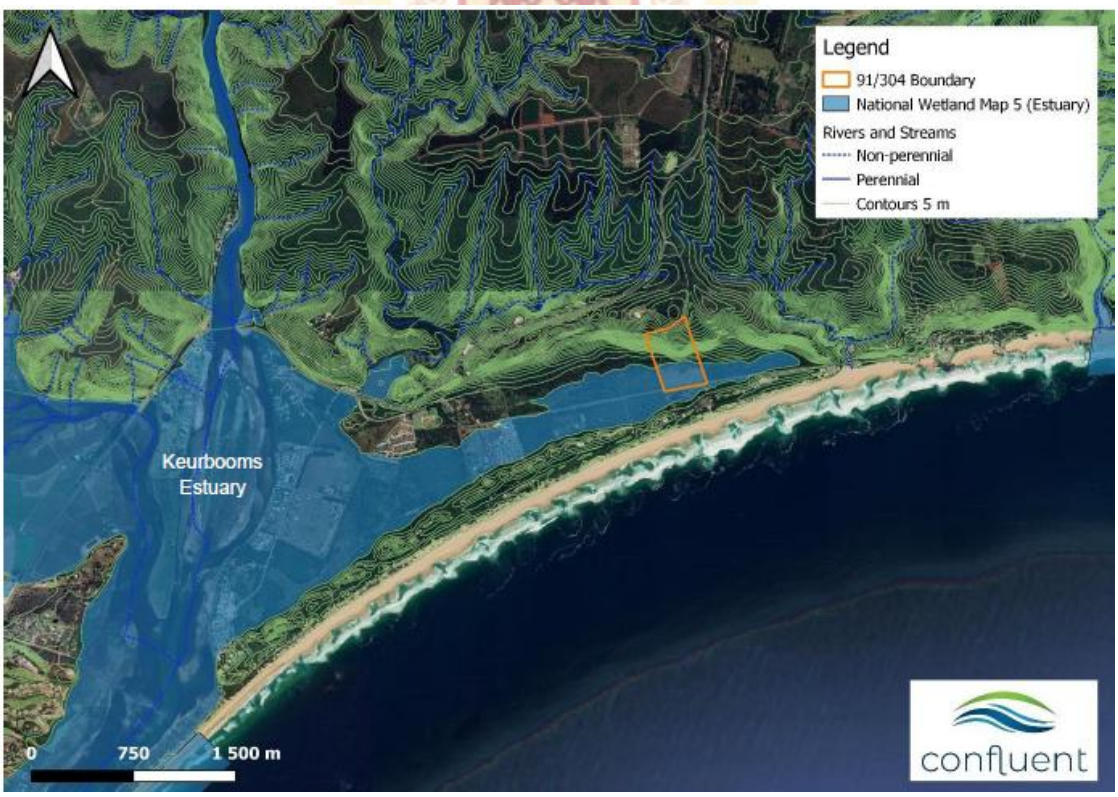

Figure 1: Location of 91/304 Matjes Fontein in relation to the mapped EFZ, contours and other watercourses
(Figure 1 of Aquatic specialist report, Appendix 1)

The applicant is applying for the authorisation of water uses in terms of Section 21 of the NWA as follows:

Section 21(c); Impeding or diverting the flow of water in a watercourse;
Section 21 (i); Altering the bed, banks, course or characteristics of a watercourse;
Section 21(e): engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1); and
Section 21(g): disposing of waste in a manner which may detrimentally impact on a water resource.

There are no existing lawful water uses on the property registered with the Water Use Authorisation & Registration Management System (WARMS).

In Appendix 2 a confirmation letter of the historical existence of the spring and excavated pond by a local resident is provided.

3.2 **Miscellaneous notes regarding eWULA forms**

The standard forms on the eWULA system do not always cater for every possible variable associated with a water use. Therefore, the following notes are highlighted for clarity and consideration by the case officer:

- DW767: Minimum, Maximum and Average volume the ponds receive:
  Calculated ratio of pond volume to the total volume per year to determine estimate volume each pond receives daily.

- DW765, Page 3, no. 2.1: Select the main sector applicable to this application:
  No choice really fits this application, so opted for Agriculture, as other drop down items such as Industry (Non-hydraulic Fracturing) is less applicable.

- DW905 - Details of waste management facility:
  Pg2: Footprint of WWTP
  Footprint is small, less than 0.5 ha, but eWULAAS does not allow less than 1 ha to be added.
  Waste type: No. 1.4, not applicable options in drop down menu. Had to choose Sewage sludge.
  Nearest resource options has dam or wetland, not spring.

3.3 **Location of Water Uses**

The water uses will take place on Portion 91 of Farm 304, Matjes Fontein in quaternary catchment **K60E**, located within the Bitou Municipality and administrative district of Knysna, Western Cape.

The property is approximately 14.7 hectares in extent and is in the area of Keurboomstrand, which is ± 8 km northeast from Plettenberg Bay. A spring and excavated pond to the north of the site was confirmed and delineated with a recommended 10 m buffer as per the aquatic specialist report (J. Dabrowski; Figure 2).

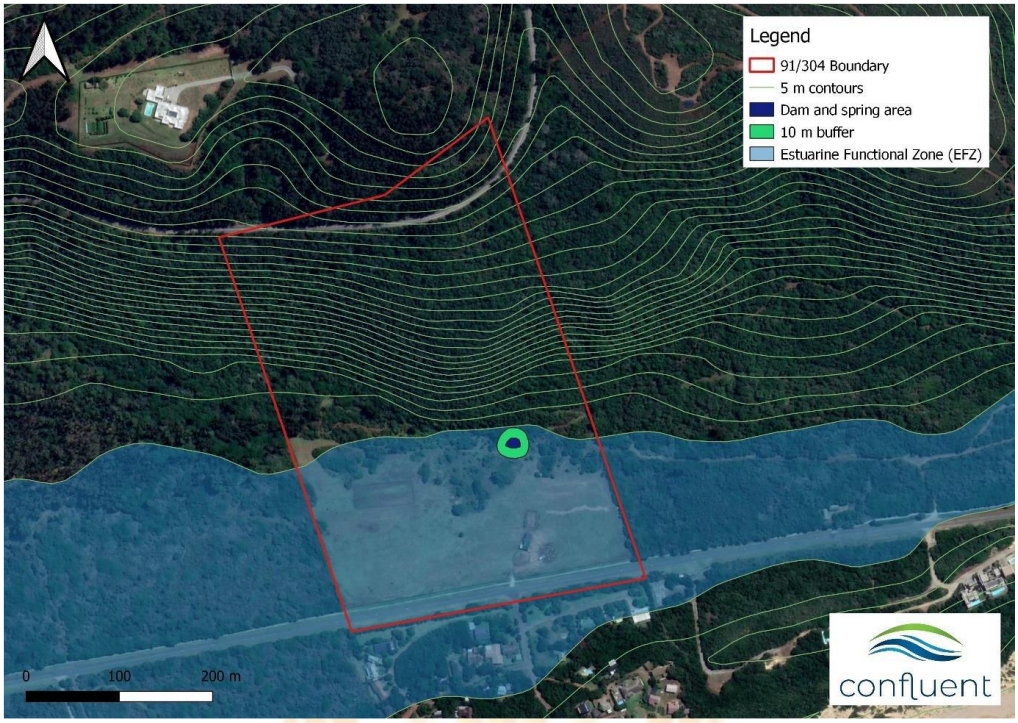

Figure 2: Location of delineated spring and excavated pond with 10m buffer (Figure 11 of Aquatic specialist report, Appendix 1)

The geographic location at the property where the water uses will take place is:
Latitude: 34° 0'21.21"S and Longitude: 23°26'10.37"E

Property details of Portion 91/304 Matjes Fontein are presented in Table *1*.

Table 1: Property details

Property description	**Title Deed number**	**Owner details on Title Deed**
Portion 91 (a portion of portion 14) of the Farm Matjes Fontein No. 304	T73549/2000	Familie Roux Eiendomme (Pty) Ltd

4. Administrative Documents and other Technical Reports submitted to support the WULA

4.1 **Administrative Documents**

4.1.1 Letter of Appointment
4.1.2 Title deed of property
4.1.3 Tax invoice of Breede-Olifants administration fee
4.1.4 Applicant's company registration certificate
4.1.5 Applicant's contact details

4.2 **Reports and other Technical Documents**

.

Table 2 lists reports and other documents submitted as part of the application.

Table 2: List of reports and other technical documents included in the application.

Report Title	Compiled by	Date of report
Geotechnical Report	Outeniqua Geotechnical Services	March 2023
Aquatic Specialist Assessment: Aquatic Biodiversity Impact Assessment	Confluent Environmental	March 2024 (Updated Feb 2025)
WULA Technical document with Section 27 Motivation	Confluent Environmental	September 2024
WULA Aide Memoir: Water Quality Management Report (WQMR)	Confluent Environmental	January 2025
Wastewater Treatment Plant Method Statement	Bio Sewage Systems	-
Bulk Services and Civil Engineering Infrastructure Report	Poise Structural and Civil Engineering Design Consultants	June 2024 (updated Feb 2025)
Geohydrology Report	DHS Groundwater	February 2025

5. Project Description

The proposal is to develop a housing estate with 60 units on Portion 91 of Farm 304 Matjes Fontein. The site development plan (SDP) was scaled back from 75 residential units to 60 units, to accommodate a 20m wildlife corridor along the base of the steep slope towards the north of the site. This corridor was recommended by the aquatic specialist to facilitate continued access to water in the spring by wildlife.

The revised layout accommodates the 20 m wildlife corridor at the base of an undisturbed slope with natural vegetation cover and creates an area far greater than the prescribed 10 m buffer area around the pond. This layout will allow animals to have access to water and opportunities to move in areas with a low gradient as opposed to steep slopes. In addition to the wildlife benefitting from this 20 m corridor, the slope base is also then protected in terms of groundwater recharge. In revised versions of the SDP, unit number 50 to the northeast of the SDP was the only major 'pinch point' recommended for removal or adjustment of the revised layout (Aquatic Report, Appendix *1*). The applicant adhered to the recommendation, and removed the unit out of the corridor, see Figure 4.

In Figure 3 below the Preferred SDP of Familie Roux Eiendomme in relation to the delineated and buffered pond area can be seen.

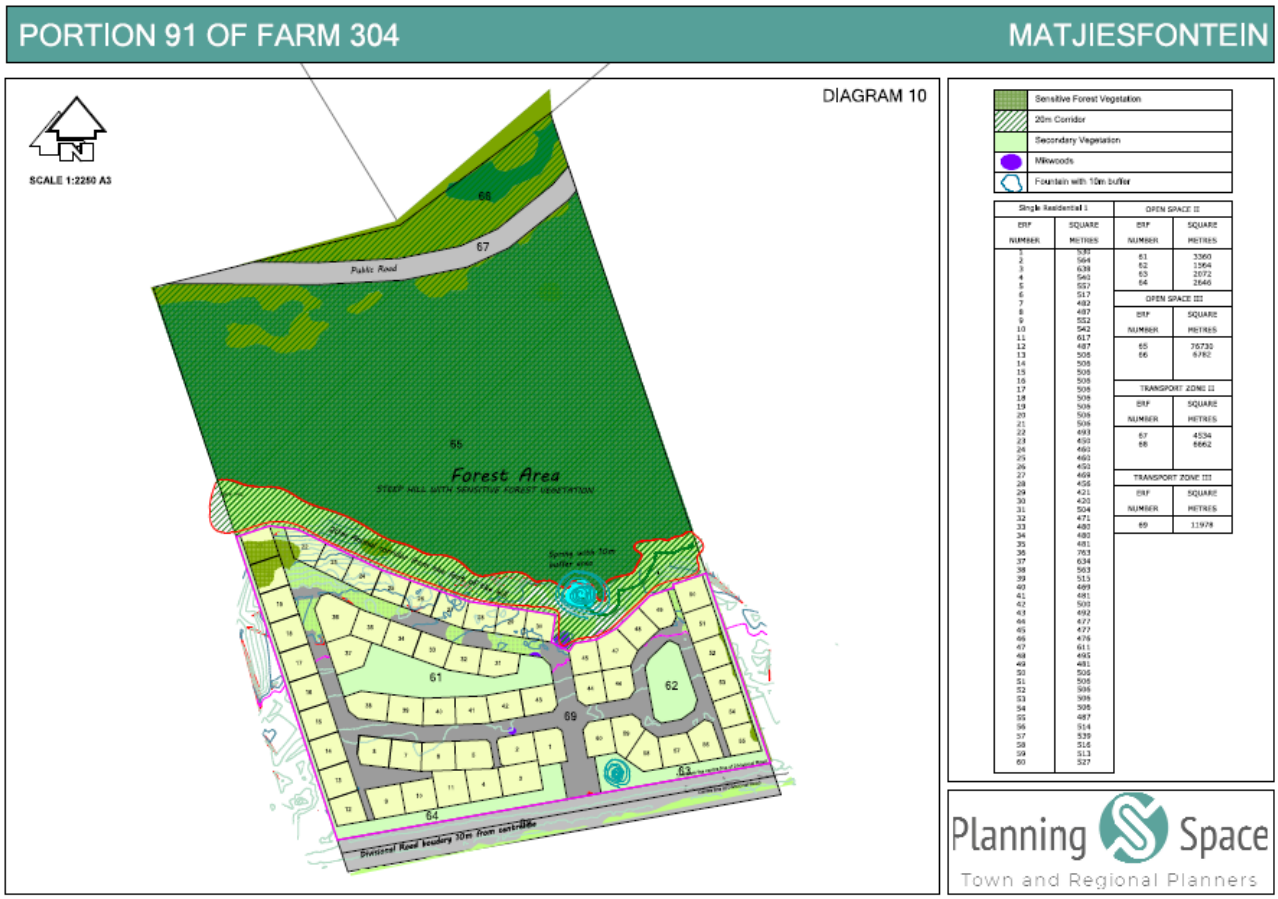

Figure 3: Site Development Plan for Familie Roux Eiendomme on 91/304 Matjes Fontein, Keurboomstrand (Planning Space, Diagram 10, Appendix 11

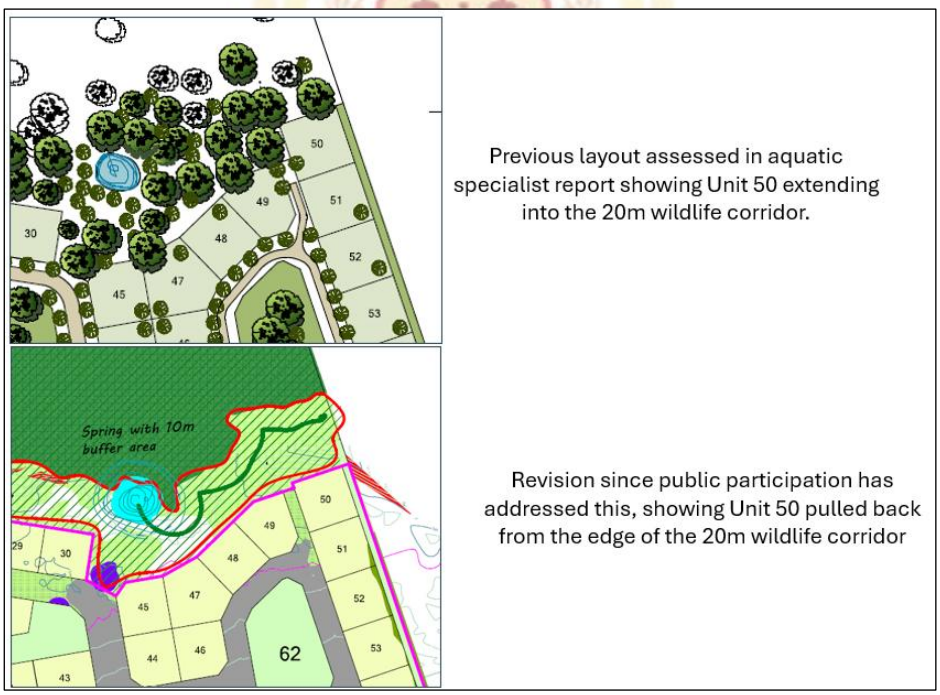

Figure 4: Unit 50 removed from 20m wildlife corridor buffer

The regulated area of a watercourse, in this case the spring and pond, is defined as the outer edge of the 1:100-year flood line or delineated riparian habitat, whichever is the greatest distance, measured from the middle of a river, spring, natural channel, dams and lakes. In the absence of a

determined 1:100-year flood line or riparian area, the area within 100 m distance from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench.

A risk matrix was compiled by the aquatic specialist as per GN4167 of the NWA to determine the level of risk posed by the development to watercourses (the spring) at the site. The outcome of the risk matrix was a Low Risk for 21(c) and 21(i) water uses. The construction of the wastewater treatment plant will be outside of the 100 m boundary of the spring with excavated pond. However, according to GN36820 (2013) for an application to qualify for irrigation with treated wastewater in terms of the General Authorisation, the location of the area to be irrigated must be:

(a) At least 50 m above the 1 in 100-year flood line or riparian habitat whichever is the greatest, or alternatively at least 100 m from a water course whichever is the greatest or at least further than a 500 m radius from a borehole that is utilised for drinking water or stock watering;
(b) On land that is not, or does not, overlie a major aquifer (identification of a major aquifer will be provided by the Department, upon written request); and
(c) At least outside 500m radius from the boundary of a wetland.

The image (Figure 5) below shows the delineated pond excavated in front of a spring on the site with a 100 m radius around it. Irrigation will therefore be within 100 m from the water resource and be excluded from a General Authorisation and therefore requires a WULA as per Section 36 of the NWA of 1998.

Figure 5: Radius of 100 m around delineated water resource on Portion 91/304 Matjes Fontein

Currently, there is no municipal wastewater system with capacity to accommodate the wastewater generated from the proposed development, until upgrades to the rising mains and the wastewater treatment plant at Gansevallei WWTW have been completed by Bitou Municipality. Wastewater from the development will be pumped to a proposed temporary new Bio Sewage System Treatment Plant (WWTP method statement; Appendix 7), with 30 kℓ per day capacity plant or similar approved. See Appendix 8 for the Bitou municipal letter confirming support for the use of the temporary WWTP. In Figure 6 below is a block diagram indicating the basic process of the proposed WWTP.

Bulk services constraints will be addressed in the Service Level Agreement between the applicant and the municipality, where the municipality will only support a certain number of houses at a time, i.e. a phased development approach as upgrades to the bulk services is done (Comment provided by Planning Space)

'The implementation of the proposed development and the conclusion of a services agreement can only occur subject to upgrades having taken place and the availability of capacity at that time' (Appendix 3, Municipal bulk services letter).

Poise Engineering Responses to Engineering Comments, Appendix 17, point 7.2 in the document, advised that the wastewater treatment plant will have no implications under high rainfall conditions. The volume of daily effluent is 22.5kl which translates to less than 0.5mm over the site development area and less than 1% of the storage volumes of the attenuation ponds.

The municipal letter to confirm that the development site will use a temporary WWTP until such time that it can be connected to the Municipal bulk sewer line, when upgraded, can be found in Appendix 5.

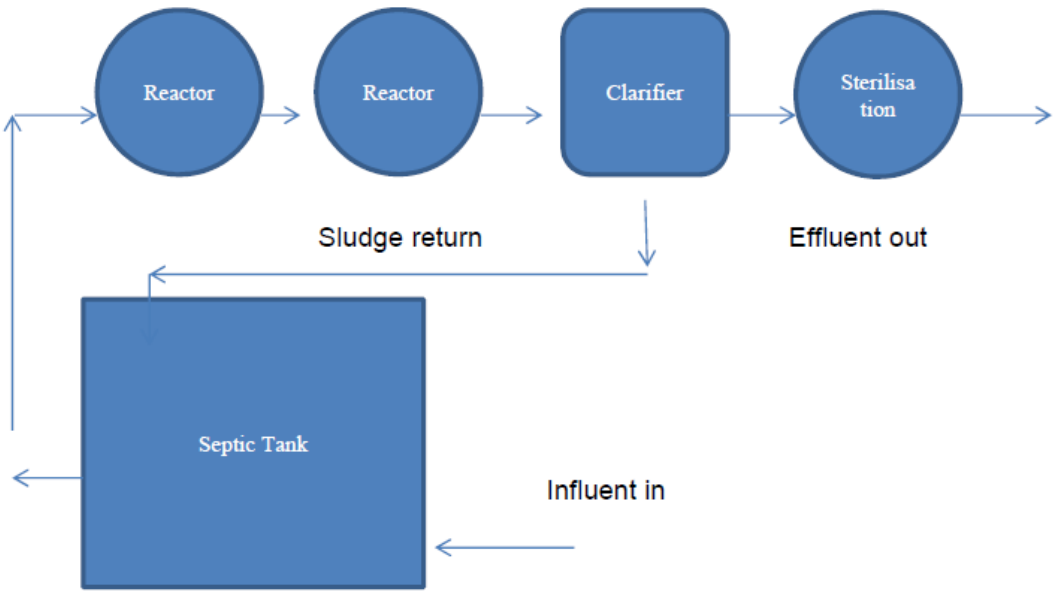

Figure 6: Block diagram of the proposed Bio Sewage System Treatment Plant (Bio Sewage Method statement, Appendix 7*)*

The Bio Sewage System plant is a containerized bioreactor plant. The raw sewage will be discharged into the underground anaerobic tank and pumped to the containerised plant. The anaerobic tank is the only underground component of the plant and is constructed with reinforced concrete including Penetron Admixture, with a durability in excess of 50-years (Civil Engineering Report, Appendix 5).

According to the engineering services report, the plant will have capacity to treat the expected average daily wastewater discharge of 28.8 kℓ from the development. The treated effluent will be pumped to an elevated holding reservoir with 60 kℓ capacity, which will be located to the northwest corner of the property. Each erf will have a connection for irrigation and toilet flushing. Approximately 22.5 kℓ of the treated wastewater will be used for irrigation of ±2.55 ha of the development site (see Table 3 below for estimated irrigation areas), the remaining ±7.5kℓ of treated water will be used for daily toilet flushing in all houses. Should there be excess effluent, it will be discharged to the three stormwater detention ponds, as the effluent will be treated to a standard as per Department of Water and Sanitation (Civil Engineering Report, Appendix 5).

Table 3: Potential irrigation areas as per Poise Structural- & Civil Consulting Engineers drawing 23G210S01 Rev F-Layout1 (Appendix 9)

Potential Irrigation Areas	m^2
Individual gardens 60 @ Avg 250 m^2	15 000
Road verges	5 000
Greenbelt areas excluding ponds	5 500
TOTAL area to be irrigated	**25 500**

In Figure 7 below, a layout of the development can be found, which indicates the location of the package plant and the relevant areas to be irrigated on the property.

According to the Poise Civil engineering report the volume of treated water will allow for an average irrigation rate of 2 mm/m^2 across the potential irrigatable area of ±2.55 ha (Appendix 5).

Figure 7: Poise Structural- & Civils Consulting Engineers SDP with irrigation area volumes and stormwater ponds indicated (DWG 23G210S01 Rev F-Layout1; Appendix 9*)*

The Bio Sewage wastewater treatment system will have a subsurface drainage system with impermeable lining beneath the anaerobic tank with a pump sump so that any leakage can be returned to the tank. Emergency storage is provided in the anaerobic tank with 60 m^3 capacity, equal to a 48-hour emergency storage period. An emergency alarm, which will activate if the effluent level rises in the emergency storage component of the system will warn if something is wrong with the treatment process. This will enable the monitoring of any potential failure or overflow of the system.

All required maintenance can be done within the 48-hour emergency storage period, but should the need arise to work longer than the 48-hour allowance, the gravity overflow pipe which will be installed to link the anaerobic tank to the Bitou municipal sewerage system, located on the opposite side of Keurboomstrand Road MR395 will be used. This overflow will only become operational in the event of the overflow of the emergency storage. There will therefore be no possibility of ground contamination through leakage or overflow. (Civil Engineering Report, Appendix 5).

The power supply to the plant will be by means of a Solar/Eskom charged battery system with a backup generator for emergency supply should load-shedding occur (Civil Engineering Report, Appendix 5)

For further information on the Bio Sewage system, and the activated sludge handling of the Bio Sewage system, see Appendix 6 and Appendix 7.

The water uses in this application are:

21(c): Impeding or diverting the flow of water in a water course.
21(i): Altering the bed, banks, course or characteristics of a water course.
21(e): Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1)
21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;

Potable water supply for the housing development will be provided by connecting to an existing water supply pipeline of Bitou Municipality, located in the road reserve of MR395 to the south of the development. However, '*The implementation of the proposed development and the conclusion of a services agreement can only occur subject to upgrades having taken place and the availability of capacity at that time*' (Municipal Bulk Civil Services letter, Appendix 3).

6. Methods Statement (only for 21 (c) and (i) activities)

Construction methods, typical for a housing estate would be followed. This would include earth moving, the use of heavy machinery and excavation work for the construction of the housing development on Portion 91 of Farm 304 Matjes Fontein.

The Aquatic report (Appendix 1) discusses the possible impacts and mitigation measures of the construction and operational phase of the project. Specific detail on the stormwater management is given in the following section of this report.

7. Methods for potable water supply and Methods for wastewater treatment

<u>The risk assessment matrix for the development</u>:

While the above water uses may be applicable in terms of authorisation of the development, their assessment does not form part of this report given that the water resource potentially impacted by the activity is groundwater and not surface water.

<u>Engineering report:</u>

The average daily water demand from the proposed development will be 36 kℓ per day (Civil Engineering Report, Appendix *5*). The proposed development falls within the Matjesfontein Reservoir distribution zone. The existing reticulation system and reservoir has sufficient capacity to service the proposed Development (GLS Report, Appendix *4*). However, there is insufficient capacity in the bulk water mains serving the reservoir, to maintain the peak seasonal storage periods. There is a masterplan in place to upgrade the bulk supply system, which is dependent on available finances at the Bitou Municipality, so no timeframe can be guaranteed for the implementation thereof. (Civil Engineering Report, Appendix 5). Alternative water sourcing is discussed in point 13.2 below as per Poise Civil Engineering report.

There is not sufficient capacity in the existing Bitou Bulk Sewage system until upgrades are complete, to accommodate the proposed housing development. A temporary wastewater treatment plant will be installed to treat the development's wastewater until upgrades to the bulk sewer system of Bitou Municipality has been made, to allow for sufficient capacity to accommodate the development (Civil Engineering Report, Appendix *5*).

The impacts and mitigation measures concerning any flood risk at the site from the engineering perspective are listed under Section 12 below.

8. Stormwater Management Plan

The stormwater management plan for the proposed housing development is guided by SuDS design principles. The Poise Structural & Civil Engineering Design Consultants Report (Appendix 5), provides information on measures prescribed to control stormwater in the proposed housing development.

According to the report, the permeable soils of the site will allow all rainwater to discharge through infiltration on the site. The total area of the site which is excluded from development is ± 9.14 hectares across a relatively steep slope with natural vegetation cover which will allow rainfall over the undeveloped areas to continue to infiltrate.

There are three catchment and pond areas (Figure 7). This caters for the 24-hour runoff volumes of 1:50-year interval storms. The Stormwater Data Table (Table 4) indicates that the retention ponds will have more storage capacity than modelled requirements.

Table 4: Stormwater Management Data Table (Poise Civil Engineering Services Table, Appendix 10)

CATCHMENT AREA	AREA	POND NO	POND AREA	POND DEPTH	TOTAL POND VOLUME	1 in 50Yr PEAK RETENTION VOLUME	1 in 100Yr PEAK RETENTION VOLUME	1 in 50Yr 24hR RAINFALL RUNOFF VOLUME
No	Ha		m2	m	m3	m3	m3	m3
C1	9,45	P spring Overflow to P1	3370,00	2,50	1984	1984 943	1984 2281	4509
C2.1	2,75	P1 Inflow from P spring Total	2515,00	1,60	4024	965 943 1908	1261 2281 3542	1815
C2.2	1,15	P2	1283	1,00	1283	378	488	759
C2.3	1,05	P3	945	0,60	567	359	491	693
TOTALS	14,40				7858	4629	6505	7776

The principals of discharge of runoff by infiltration through permeable paving and grass block roads surfaces and infiltration ponds will enhance simple adherence to the regulatory SUDS reduction specifications. For calculation of the discharge from the ponds, an infiltration rate of 2 cm per hour

has been adopted. This figure is considered conservative considering the sandy nature of the underlying soils and on site drainage observations and an on site infiltration test. Further infiltration tests will be undertaken in the detailed design phase (Civil Engineering Report, Appendix 5).

The total area of the site to be developed is ±5,28 hectares. The stormwater will be managed such that roof areas will drain to gardens which will fall towards roads or directly to one of three infiltration attenuation ponds P1, P2 and P3 to be provided. The main access roads will be surfaced with permeable paving and secondary roads with grass block paving. In either case, sustained infiltration will occur across these areas, and surface runoff will be mitigated to a large extent.

Excess runoff from the road surfaces which does not infiltrate will be surface discharged to the infiltration ponds.

Based on an average roof area of 225 m^2 the overall impermeable roof area will be approximately 25 percent of the road reserve and landscaped areas. This impermeable proportion does not increase the total discharge volume of the site, but does reduce the available infiltration area, and therefore increases the required duration of infiltration. Containment of the excess discharge within the ponds, will allow for the longer discharge infiltration time.

Site levels will be designed to ensure the effective implementation of the stormwater management system. The minimum floor level of any stand will be 4.0m amsl. The site slopes and road levels will be designed to flat gradients to enable maximum infiltration whilst draining on surface to the ponds. The levels will also be designed to contain flood runoff within the ponds.

The preliminary estimated pond invert levels are such that they will be a minimum of 1.5m above the existing water table. The site design levels will protect homes in the rare event of flooding and will also detain excess site runoff from flooding over the Keurboomstrand Road if that should ever occur (Civil Engineering Report, Appendix 5).

9. Rehabilitation Plan

There is no rehabilitation plan for this housing development.

10. Water Uses

This application includes the following water uses as detailed in Table 5.

Table 5**:** Water Uses Applied for

Water use(s) activities	**Purpose**	**Capacity/ Volume**	**Property Description**	**Co-ordinates**
Section 21 (c) – impeding or diverting the flow of water in a watercourse				
Impeding the flow of water to the spring	Construction of a housing development within the regulated area of a water resource	±5.28 ha	91/304	34° 0'19.41"S 23°26'12.00"E
Section 21 (i) – altering the bed, banks course or characteristics of a watercourse				
Altering the characteristics of the spring	Construction of a housing development within the regulated area of a water resource	±5.28 ha	91/304	34° 0'19.41"S 23°26'12.00"E
Section 21 (g) - disposing of waste in a manner which may detrimentally impact on a water resource				
Wastewater treatment plant (WWTP)	Construction of a WWTP with a pump station and emergency storage anaerobic tank	30 m^3/day	91/304	34° 0'21.66"S 23°26'13.24"E
Retention Pond 1 within 100m of the spring	Stormwater pond and Emergency temporary storage of treated wastewater	4 024 m^3	91/304	34° 0'19.14"S 23°26'7.37"E

Water use(s) activities	Purpose	Capacity/ Volume	Property Description	Co-ordinates
Retention Pond 2 within 100m of the spring	Stormwater pond and Emergency temporary storage of treated wastewater	1 283 m^3	91/304	34° 0'19.67"S 23°26'15.10"E
Retention Pond 3	Stormwater pond and Emergency temporary storage of treated wastewater	567 m^3	91/304	34° 0'22.43"S 23°26'8.84"E
Section 21 (e) - engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1)				
Irrigation with treated wastewater within 100m of a spring	Use of treated wastewater to irrigate designated areas of the development	22.5 m^3/day	91/304	34° 0'16.30"S 23°26'2.86"E & 34° 0'20.84"S 23°26'17.65"E

11. Description of the Environment

The site is located in quaternary catchment K60E, with a watercourse adjacent to the footprint of the proposed development, namely a spring. According to the National Wetland Map 5 (NWM5) the only mapped aquatic feature is the Estuarine Functional Zone (EFZ), identified by an area below 5 m.a.m.s.l. (metres above mean sea level). The aquatic specialist found that the site did not have any indication of estuarine habitat during the site visit. The 5m contour is a desktop delineation of estuarine habitat to indicate likely areas of estuarine habitat (Aquatic Report, Appendix 1). It is also useful for identifying low-lying areas that may be prone to flooding. Although in this instance, the property is located above the 1:100 year floodline at the 'end of the floodplain', making it unlikely that flooding will be a significant hazard.

The Mean Annual Precipitation is 872 mm. According to Cape Farm Mapper the average temperature is 16.4 ℃ with a temperate climate, no dry season and warm summers (Köppen-Geiger Climate Zones, 1980-2016).

Contour lines and flooding implications of the site:

In
Figure 8, it can be seen that the 3m – 3.5m contours are concentrated on the southern side of the Keurbooms Road and only extend over a very small area of the proposed development area, close to the road.

The road itself acts as a barrier at 3.5m between the south (where any flooding would originate from the Keurbooms River) and the north (the development area), therefore, the flood would need to be higher than 3.5 m to enter the site from the south. During severe flooding in the area in 2007 the highest level reached by floodwaters was The Dunes development at around 2.5m amsl about 1.1km west of the property.

Any flooding would come from the south (Milkwood Glen side) and move towards Portion 91, not the other way around. But this would likely be stopped by the road. This is most likely why the 1:100 year floodline is indicated as stopping south of the road.

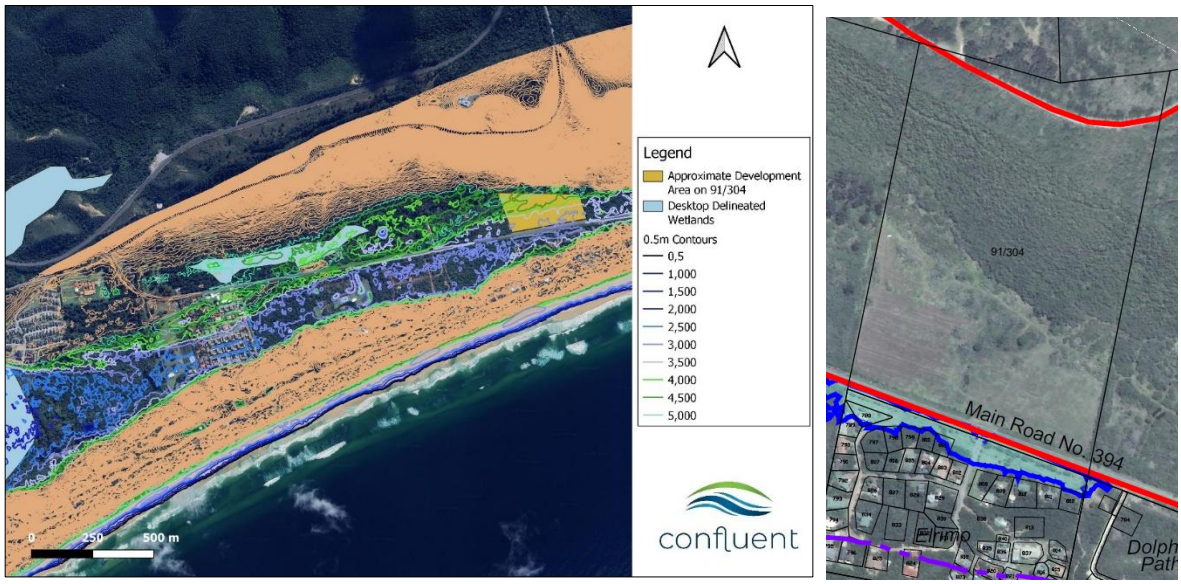

Figure 8: 0.5m contour map depicting the approximate development area in relation to the Keurbooms estuary and floodplain (Figure 17 of Aquatic report, Appendix 1*). The right image shows the mapped 1:100 year floodline (in blue) according to the Keurbooms and Environs Local Area Spatial Plan (KELASP).*

12. Impacts and Mitigation Measures

An important mitigation measure recommended by the aquatic specialist is a 20 m wildlife corridor protected along the base of the steep slope (Figure 9). The development will be fenced off from the corridor and spring to prevent disturbance of wildlife by pets and people in the development. The aim is for a continuous corridor along the slope base along all properties, and fencing should not extend beyond the development area along property boundaries. This will allow animals to have access to water and provide movement areas in the lower gradient. It also helps to protect the slope base in terms of groundwater recharge (Aquatic Report, Appendix 1).

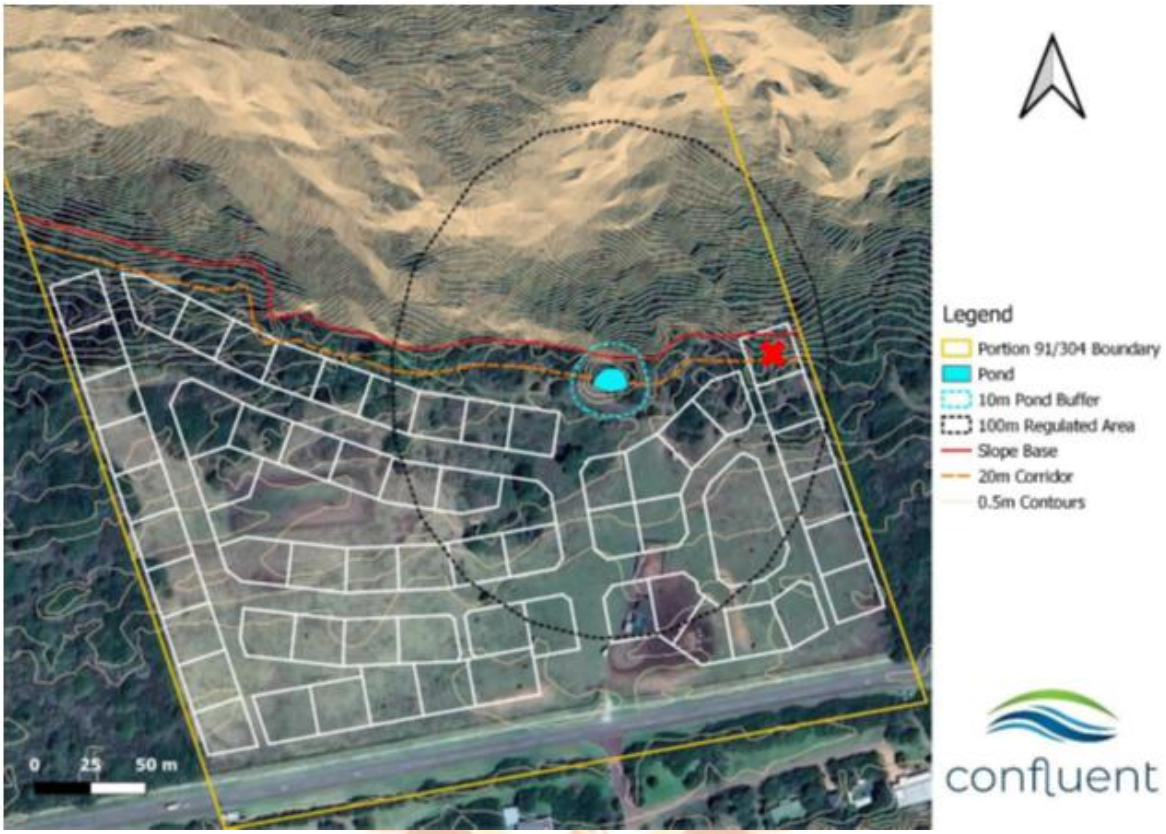

Figure 9: Preferred site development plan overlaid with 0.5 m contours, indicating the pond and buffer, the 100m regulated area of the spring, and the 20m wildlife corridor at the base of the slope. Note that the red X indicates Unit 50 which was subsequently moved back and out of the wildlife buffer (Aquatic Report Figure 18, Appendix 1)

The Risk Assessment Matrix (RAM) outcome was a low risk (see Table 2 of the Aquatic report, Appendix 1). The potential impacts and mitigation measures as per the Aquatic report that are expected from the proposed development activities are presented in Table 6 below.

Following the public participation comments received, additional analysis, modified aspects of the layout and consultation with the BOCMA engineering specialist regarding engineering services has been conducted. Following this process, the impacts and mitigation measures from the engineering perspective addressing the perceived flood risk of the site can be found in Table 7 below. The flood risk to neighbouring properties as well as the possible future flood risk impact due to climate change, is also summarized under this section. It was noted that the flood risk is mainly applicable under the scenario of extreme events and future climate change predictions, because the present risk is really low. Also see section 10 above on the flood risk to neighbouring properties when considering the 0.5m contour lines and the 1:100 year floodline (Figure 8).

The comments and concerns with regards to the impacts on the groundwater resource due to the development, have been assessed by the Geohydrologist. Risks and impacts with corresponding mitigation measures to limit the impact on the groundwater resource, as per the Geohydrology report (Appendix 14) are provided in Table 8. The conclusion from the geohydrologist was that with the recommended mitigation strategies, monitoring framework, and proactive management measures in place, the potential negative impacts on groundwater quality, recharge, and flooding can be reduced to negligible levels. This will ensure the protection of groundwater resources, safeguard water users, and uphold environmental sustainability throughout the construction and operational phases of the development.

Table 6: Mitigation measures for the protection of the spring, pond and buffer area during the construction and operational phase of the development (Table 3 of Aquatic report, Appendix 1)

Impacts of the activity on the water resources	**Mitigation Measures**
Construction Phase Activities (Site preparation)	
Earthworks and vegetation clearing for construction activities	• Pre-construction erect temporary fencing along the entire green corridor and open space to protect the pond as well as the corridor from impact during construction. • Add signage to the fence indicating the area as No-Go. • Site inductions for all staff must ensure contractors and works area aware they may not enter the pond and spring area.
Operational Phase Activities	
Inputs of stormwater from roofs and roads into the pond	• No stormwater infrastructure to be directed towards the pond. • Routine maintenance inspections to clear windblown / discarded litter from the pond and spring. • Stormwater from the development should be diverted to detention ponds on the site which are indicated on various SDP layouts and are consistent with the SUDS approach to stormwater management.
Landscaping, gardening and maintenance extending into the pond and buffer area	The purpose of the pond and spring is to provide a sustained, clean water source for wildlife in the 20 m green corridor. • Landscaping and gardening staff must not undertake any clearing of vegetation inside of the 10m buffer or the wildlife corridor. • A bird hide in the buffer to spot wildlife would be acceptable, but no additional recreational activities. The point is to create a quiet habitat with suitable vegetation cover for continued use by animals, birds etc. • Indigenous plants found in adjacent thickets may be planted around the pond. Only indigenous plants found in the immediate surrounding area may be planted. • A list of recommended wetland plants for that can be used to improve vegetation cover of muddy areas and marginal areas of the pond is provided in this report. • Do not place any fish into the pond as only alien invasive fish to the area would survive and could be transferred to other waterbodies on the feet of animals or birds. • The only plants that should be removed from the area are listed alien invasive species.
Fencing	• A perimeter fence is recommended along the northern section of the property to preserve the wildlife corridor and natural area beyond. The fenceline should not extend into the 20m corridor, and should aim to separate the development area from the conservation / wildlife area. • Clear vu type fencing would have the important benefit of excluding pets (cats and dogs) from the wildlife corridor area where they could deter or kill wildlife large and small. • Fencing should not extend into the corridor on the neighbouring boundaries as the aim is to have an inter-connected corridor that extends across properties, should development occur in adjacent areas.
Irrigation with treated wastewater	• Install two groundwater spikes or wells at 8-10m depth to monitor groundwater quality. These should be located at least 200 m apart and provide easy access during construction and operational phases of the development. • Wells must not be located in any areas of natural vegetation, rather opting for locations in previously disturbed grassy areas. • Samples must be collected pre-development to determine baseline water quality (at least once/month over 3 months), to monitor possible impacts over time. Samples should be analysed from the start of construction onwards and be

Impacts of the activity on the water resources	Mitigation Measures
	submitted for analysis on a monthly basis. Parameters for analysis should be aligned with those indicated in the DWS general limits. • Water chemistry must not vary by 10% of the background levels established through baseline sampling. If sampling shows indications that eutrophication of the groundwater is occurring for 3 months consecutively, then this is a reportable incident to BOCMA and DEA&DP, and an alternative to irrigation with treated wastewater or improved treatment must be immediately secured. • Water sample results must be submitted to BOCMA, the Bitou Municipality and reviewed by an aquatic ecologist on a quarterly basis from commencement of the development until the municipal WWTW has been upgraded and the package plant is no longer required.

Table 7: Engineering Flood risk impacts and mitigation measures (Poise Engineering, Appendix 5)

Flood Risk	Mitigation Measures
High rainfall causing overflowing of effluent ponds	• The pond designs compensate for the lesser infiltration area due to impermeable surfaces for the 1 in 100 year storm interval. • The pond catchment basins will ensure that overall storage volume is not less than the current natural state (Poise engineering). • The wastewater treatment plant will have no significant implications under high rainfall conditions. The volume of daily effluent is 22.5kl which translates to less than 0.5mm over the site development area and less than 1% of the storage volumes of the attenuation ponds • The total pond volumes also exceed the 1 in 50 year storm 24 hour runoff volume in all cases.
High rainfall causing flooding	• The site levels will be reshaped to drain toward the stormwater ponds, and the surrounding pond catchment crest levels will be designed such that the overall site flood storage volume is not reduced from that of its current natural state. The site will continue to serve as a soakaway.
Natural flood defence of the site	• The data indicates that the infiltration ponds will have considerably more storage capacity than the modelled requirements. The total pond volumes also exceed the 1 in 50 year storm 24 hour runoff volume in all cases (Poise Engineering Stormwater Data Table, Appendix 12).
Flooding of neighbouring properties	• Following SUDS principles, the discharge of runoff by infiltration through permeable paving and grass block roads surfaces and infiltration ponds which will enhance simple adherence to the regulatory SUDS reduction specifications. • As per the Stormwater Data Table (Appendix 12), the maximum stored volumes, 24-hour runoff volumes cater for the 1:100 year return interval storm • The infiltration ponds have considerably more storage capacity than the modelled requirements • The Development stormwater management plan mitigates the impact of flood conditions for the Development and

	ensures that the Development will not negatively impact on surrounding properties under flooding conditions • Surveyed levels on the southern side of Keurboonstrand Road indicate the floodline to be approximately 500mm lower than the crest of the road.
Slope runoff	• The site is characterized by 2 catchment areas (See Figure 1 of Poise Engineering catchments, Appendix 15) . The northern Catchment Area 1 consists of the northern forested area with gradients as steep as 50% and a flatter strip at the southern bottom end of the slope. • The flat strip has a crest along its southern edge which falls across the site from west to east, and contains the runoff from the northern slope from flowing southward. • This strip has a very slight fall eastwards towards a natural spring surrounded by a natural depressed pond at the base of the slope. • The southern Catchment Area 2 is very flat by nature, generally less than 3 percent and falling southwards towards Keurboomstrand Road. The lowest point is in the south eastern corner of the site.
Future flooding due to climate change	• Based on an average roof area of 225 m^2 the overall impermeable roof area will be approximately 25 percent of the road reserve and landscaped areas. • Site levels will be designed to ensure the effective implementation of the stormwater management system. • The minimum floor level of any stand will be 4.0mamsl. • The site slopes and road levels will be designed to flat gradients to enable maximum infiltration whilst draining on surface to the ponds. • The levels will also be designed to contain flood runoff within the ponds. • The main access roads will be surfaced with permeable paving and secondary roads with grass block paving • The site design levels will protect homes from flooding and will also detain excess site runoff from flooding over the Keurboomstrand Road. • The principles of discharge of runoff by infiltration through permeable paving and grass block roads surfaces and infiltration ponds will enhance simple adherence to the regulatory SUDS reduction specifications

Table 8: Geohydrological impacts and mitigation measures (Section 7 and 8 of Appendix 14)

Groundwater Risk	Mitigation Measures
Construction phase:	
Groundwater Contamination	
Harmful chemicals, construction debris and dirt, solid waste disposal and storage	• Properly manage hazardous materials, debris, waste, and stormwater runoff during the construction phase. • Implement strict protocols for handling, storage, and disposal, along with effective spill containment measures, will significantly minimize the risk of pollution. • Regular servicing and maintenance of infrastructure throughout the operational phase are essential to ensure long-term environmental protection. • Monitoring piezometers should be installed to assess at least the shallow aquifer. These piezometers will provide essential data and help track any changes in the shallow aquifer over time. • Regular monitoring of the groundwater makes it easier to identify potential issues such as contamination.
Operational Phase:	
Groundwater Contamination	
Leakages from sewage pipework system, underground raw sewage holding tank, WWTP leachate, irrigation with treated wastewater	• Prevent groundwater contamination, by properly managing hazardous materials, debris, waste, and stormwater runoff during the construction phase. • Implement strict protocols for handling, storage, and disposal, along with effective spill containment measures, will significantly minimize the risk of pollution. • Regular servicing and maintenance of infrastructure throughout the operational phase are essential to ensure long-term environmental protection. • Monitoring piezometers should be installed to assess at least the shallow aquifer. • Regular monitoring of the groundwater, makes it easier to identify potential issues such as contamination.
Groundwater Recharge and potential Flooding	
Reduced groundwater replenishment and possibly lower groundwater levels over time and possible increase of flooding risk	• Rain and stormwater drainage systems must be designed to balance groundwater recharge and flood prevention. • Effective drainage planning will manage surface runoff while promoting natural infiltration, ensuring sufficient water reaches the groundwater while preventing accumulation in undesirable areas that could lead to flooding. • Installing piezometers—devices used to measure groundwater levels—is essential for ongoing monitoring of the groundwater system. • Continuous monitoring will help maintain groundwater balance and allow for timely interventions to address any emerging issues
Aquifer Impact Assessment:	

Assessment of the Reduction of Contaminants in the Unsaturated Zone	
Due to the sandy composition, the unsaturated zone is expected to have high permeability, allowing contaminants to move rapidly with minimal filtration or absorption.	This underscores the need for additional protective measures to manage chemical pollutants, particularly in areas with sandy or highly permeable soils where natural filtration is less effective.
Aquifer Vulnerability Rating (DRASTIC Method)	
Overall measure of groundwater susceptibility to contamination.	To mitigate this risk, stringent aquifer protection measures are essential. These should include: • enhanced monitoring, • advanced wastewater treatment, • secure containment of hazardous materials, and • strict management of construction and operational activities. Implementing these safeguards will help prevent contamination and ensure long-term groundwater protection.
NEMA Impact Assessment	
<u>Construction</u>	
Spillages of diesel, petrol, oil, paints and other harmful chemicals. These substances may potentially percolate into the groundwater and enter the surrounding environment.	• Install the sewage and wastewater infrastructure according to applicable national SANS standards (SANS1200 Part K:Civil Engineering Standard Specifications, SANS10400:The National Building Regulations and Building Standards Act, SANS 1913:Planning, Design, and Construction of Sanitation Systems), DWS Guidelines and adhere to municipal regulations & by-laws. • Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies. • Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination. • Cover stockpiles of building materials like cement, sand and other powders. • Regularly inspect stockpiles for spillages and store away from waterways or drainage areas. • Collect any wastewater generated from site activities during construction in settlement tanks then screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations. • Install at least three monitoring piezometers into the water table, one upstream and two downstream of the site. After the implementation of mitigation measures, the consequence becomes negligible, and the significance remain as negligible - negative
<u>Operational phase:</u>	

- Leakage from underground sewage holding tank and associated pipework. - Leaks and leachate from the wastewater treatment plant. - Improperly treated effluent used for irrigation. - WWTP failure. All of the aforementioned impacts could percolate into the groundwater.	• Ensure the WWTP comply with SANS1200 Part K:Civil Engineering Standard Specifications, NWA, Water Quality Guidelines (DWAF), SANS1913:Planning, Design, and Construction of Sanitation Systems, Wastewater Treatment Plant Design and Operational Guidelines (DWAF, 2008) • All areas where potential leachate may occur are to be paved and cemented. • Regularly service the WWTP and inspect the integrity and efficacy of the WWTP. • Ensure emergency procedures are in place to rapidly repair WWTP should failure occur. • Set up a comprehensive monitoring system to monitor the effluent quality. • Incorporate monitoring network as implemented during the construction phase into operational phase monitoring • Install shallow aquifer piezometers in close proximity to the WWTP to be monitored regularly for any leakages. • Should a leak be detected or the monitoring piezometers be contaminated, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities. After the implementation of mitigation measures, the consequence becomes negligible, and the significance remain as negligible – negative
Infrastructure limiting groundwater recharge and/or flooding risk	• Permeable pavement and green infrastructure (limit coverage of surface area by infrastructure as far as possible. • Rainwater Harvesting • Sustainable Urban Drainage Systems (SUDS) • Retention and Detention Basins • Design stormwater drainage systems to handle increased rainfall events by incorporating overflow pathways, sump pumps, and flow control structures. • Installation of piezometers to track groundwater level. • Inspect and maintain drainage systems, stormwater infrastructure, and mitigation features After the implementation of mitigation measures, the consequence becomes negligible, and the significance remain as negligible - negative.
Given the shallow water table, it is critical to implement stringent mitigation measures to prevent any potential groundwater contamination. These measures should be focused on the following:	
• **Early detection** of any contaminants or leaks due to the shallow groundwater level. • **Strict management** of potential contamination sources, such as wastewater treatment and effluent disposal, to ensure that pollutants do not reach the water table. • **Protecting groundwater recharge** by maintaining the natural flow of water into the aquifers and avoiding excessive impermeable surfaces that may reduce infiltration. • **Flood prevention measures** to avoid overwhelming the drainage system and ensuring that the natural hydrological system is not disrupted.	

Additional Mitigation Measures

In addition to installing piezometers and monitoring groundwater quality and levels, the following management and mitigation measures are recommended:

1. Waste Containment and Infrastructure
   - Use synthetic/geotextile liners and impermeable surfaces approved by the Department of Water and Sanitation (DWS) in areas where sewage and associated waste are handled.
   - Construct all sewer lines and pipes to ensure leak-proof systems that prevent contamination.
   - Ensure that sewage holding tanks and accommodation facilities are properly managed to prevent overflow and spillage.

2. Inspection, Maintenance, and Leak Prevention
   - Conduct regular inspections and upgrades of pipes and associated infrastructure to maintain system integrity.
   - Install leak monitoring devices in the sewage system to enable early detection and proactive groundwater contamination prevention.
   - Keep the facility clean and well-maintained at all times to reduce the risk of pollution.

3. Waste Management and Disposal
   - Dispose of all waste at registered landfill sites; on-site dumping and disposal in surrounding areas are strictly prohibited.
   - Sludge and waste must not be disposed of on-site due to the shallow groundwater table, which increases the risk of contamination.
   - Properly clean up and dispose of spills or sludge at a registered landfill site to prevent environmental hazards.
   - Ensure that all waste-handling surfaces are impermeable to prevent leaks and seepage.
   - Implement an effective stormwater management system to prevent runoff from coming into contact with waste.
   - Divert and control stormwater to reduce contamination risks.
   - By implementing these measures, the risk of groundwater contamination, infrastructure failure, and regulatory non-compliance can be significantly reduced.
   - Implement green infrastructure and permeable surfaces to enhance infiltration, reduce runoff through rainwater harvesting and SUDS, and manage excess water using retention and detention basins. Design stormwater drainage systems to handle heavy rainfall with overflow pathways, sump pumps, and flow controls. Install piezometers for groundwater monitoring and conduct regular inspections and maintenance of drainage systems to ensure long-term effectiveness.

Conclusion of Geohydrology study, which assessed the impacts and mitigation measures to be taken to protect the groundwater resource (*Appendix 14*):

Despite the limitations in the available data, the risk of groundwater contamination associated with the proposed development is considered ***minor – negative****. However, with the implementation of the appropriate* ***mitigation strategies****, the significance of this impact can be* ***reduced to negligible – negative****. It is imperative that these strategies are maintained throughout the construction and operational phases to protect the groundwater and the surrounding environment.*

It is essential that rigorous mitigation measures are implemented, including the proper containment of potential contaminants, use of spill containment systems, and regular inspections of infrastructure to prevent leakage. ***By enforcing these mitigation strategies, the risk to the aquifer can be reduced to negligible-negative****. Furthermore, it is crucial to establish a regular monitoring program to assess groundwater quality throughout the life of the development, ensuring that contamination is detected early and addressed promptly.*

By implementing the recommended monitoring network and mitigation measures outlined above, the risk of groundwater contamination during both the construction and operational phases can be reduced to negligible - negative. This will ensure that groundwater quality is continuously protected and that any potential issues are addressed promptly, safeguarding the health and sustainability of the surrounding ecosystem and water users.

13. Water Demand and Water Supply Analysis

13.1 Water Demand

Poise Structural & Civil Engineering design consultants report (Appendix *5*Appendix *3*), determined that the water demand for the 60 erven will be as follows:

- Average daily demand = 36 kℓ
- Peak flow demand (peak factor – 4) = 1.7 ℓ/s
- Fire flow demand (low risk) = 15 ℓ/s @ 10 m residual head

13.2 Water Supply Analysis

The development falls within the Matjesfontein reservoir. The GLS Capacity Analysis Report confirms that the existing reticulation and reservoir has sufficient capacity for the development, but during peak periods, there is insufficient capacity in the bulk water mains which serves the reservoir (Municipal Bulk Civil Services, Appendix 3). The Bitou Municipality confirmed that master planning is in place for upgrades to the bulk supply system, but is dependent on funding, therefore a timeframe cannot be guaranteed for the needed upgrade.

Alternative water sourcing is proposed by the Civil Engineering consultants (Appendix 5), by optimising the use of rainwater harvesting for domestic use and to use treated greywater for irrigation purposes. Detailed solutions will be addressed during the detail design stage to be approved by the Bitou Municipal Engineering Department.

The development falls within the Keurboomstrand main pump station which is routed to the Municipal Gansevallei Wastewater treatment plant. The development will connect to an existing 160 mm sewer pipeline which is opposite the development site, on the southern side of Keurboomstrand Road (GLS Report, Appendix 4). The average daily discharge from 60 units is 30 kℓ from the development, which is based on a peak factor of 2.5 and a maximum discharge of 0.8 ℓ/second (Poise Engineering, Appendix 5). The GLS report confirmed that there is sufficient capacity at the pump stations for the development, but that upgrades are required to certain rising mains and that the WWTP is currently at full capacity (GLS Report, Appendix 4). The bulk connection to the Bitou sewer network will be commissioned once the Ganzevallei WWTW has been upgraded and the temporary WWTP will then be decommissioned (Poise Engineering, Appendix 5 and Municipal letter Appendix 8).

13.3 Water Balance

The ± 30 kℓ/day of treated effluent will be used for irrigation as well as toilet flushing of the 60 households of the development. The treated effluent from the WWTP will be pumped to an elevated reservoir with 60 kℓ capacity, form where irrigation will take place and the balance used for toilet flushing of the 60 houses. The Poise Engineering report (Appendix *5*) indicated the extent of the potential irrigation areas (Figure 3) and calculated the volume of water that will be used for these areas. See Table 9 below for the breakdown of the potential irrigation areas and Table 10 where the calculated volume of water which will be available and used for the areas to be irrigated or as grey water is indicated.

*Table 9: Potential irrigation areas as per Poise Engineering Services drawing; Revision F (*Appendix 9*).*

Area to be irrigated	Area in m^2
Individual gardens: 60 @ Average 250 m^2 each	15 000
Road verges	5 000
Greenbelt areas excluding ponds	5 500
Total	**25 500 m^2**

Table 10: Average Water demand and discharge volumes and potential irrigation areas with treated wastewater (Adapted from the Civil Engineering Report, Appendix 5)

Parameter	Unit
Daily water demand (600 ℓ per erf)	36 kℓ
Daily discharge (500 ℓ per erf)	30 kℓ
Total irrigation area	2.5 ha
Daily toilet flushing (3 occupants per house)	7.5 kℓ
Daily irrigation of demarcated areas	22.5 kℓ

Based on a peak factor of 2.5 the maximum peak discharge will be 0,86 litres per second. Based on a typical garden sprinkler irrigation application rate of 10mm over a 15 minute session, the daily irrigation area required would be 2250 m^2. If each area was to be irrigated once per week, only 62% of the irrigatable area would be required. Should it be required, excess effluent will be discharged to the stormwater infiltration ponds system. This will be environmentally acceptable, the effluent being to DWS Special Limits quality (Poise Engineering, Appendix *5*)

When irrigation is not possible, the treated effluent can be stored in the on-site irrigation reservoir (60 m^3 capacity) with sufficient surplus capacity to accommodate the generated treated effluent for an emergency period of 48 hours. Should additional emergency storage be needed, the treated effluent can be discharged to stormwater detention ponds. See the Poise Engineering Drawing in Appendix 9 for the stormwater pond volumes and estimate infiltration rates.

14. Water Quality

Water quality impacts relate mostly to groundwater as opposed to surface water. This is because the spring and associated pond are at a higher elevation than most of the proposed development area, meaning that irrigation with treated wastewater could not influence this water resource. Furthermore, the spring and pond are located within the wildlife corridor where irrigation with treated wastewater will not take place.

Any possible negative impacts to water quality of the spring which could result during the construction and operational phase of the project have been addressed in the mitigation measures, see section 11 of this report and further details in the Aquatic report (Appendix 1).

To ensure groundwater quality is maintained and monitored, 2 groundwater spikes / wells at 10m depth will need to be drilled (as per Aquatic report Appendix 1), to monitor the groundwater on the upland area and near the spring buffer. The wells should be located 200m apart with easy access during both the construction and operational phase. The Geohydrology report also provided instructions and mitigation measures to monitor groundwater quality and levels by means of Piezometers (see Table 8 above).

Water samples to be collected for at least 3 months on a monthly basis before construction begins providing a baseline against which further monitoring can be compared during monthly sampling in the construction and operational phase (Aquatic Report, Appendix *1*).

Electrical Conductivity (EC) of groundwater in the area is generally between 150 and 370 mS/m11. This is considered as a “moderate” water quality with respect to drinking water standards.

Groundwater samples were collected for analysis of the major ions and trace elements from the hydrocensus spring MF01, situated within the site perimeter, and spike MG01 which is approximate 30 m south of the site. The laboratory reports are presented in Appendix A of the Geohydrology report (DHS Groundwater, Appendix *14*). Water quality results were compared with the SABS drinking water standards (SANS 241-1:2015, edition 2)13 (Table 6 of the DHS Groundwater report).

Water is classified unfit for human consumption if the Standard Limits are exceeded.

15. Public Participation

The public participation (PP) process must be completed in terms of Section 41 (4) of the National Water Act, Act no 36 of 1998. A PP was done to include the proposed development with wastewater treatment plant, from 12 September 2024 until 11 November 2024. The results thereof are presented in a separate PP report.

A high number of comments were received from Interested and Affected Parties regarding the proposed development and application for a Water Use License. The majority of respondents were local residents in the area who are not supportive of the proposed development. A significant effort was made to thoroughly record and respond to all comments from I&APs, and the entire project team were involved in compilation of responses. Some of the comments resulted in more detailed assessment required especially for the engineering services report. All reports were updated with additional information aimed at addressing concerns highlighted in the PP process.

16. Inputs/Authorisations from other Departments /Stakeholders

1. Municipal Bulk Civil Services approval for development (Appendix *3*).
2. Municipal approval for development to allow package plant until upgrade of Municipal wastewater plant (Appendix 8).

17. Section 27 (1)

The requirements contained in Section 27(1) of the National Water Act, 1998 (Act 36 of 1998) have been considered and are discussed further below.

a) Existing Lawful Water Uses

There is no existing lawful water use in place.

b) Need to redress the results of Past Racial and Gender Discrimination

The construction of the housing development, on Portion 91 of Farm Matjes Fontein 304 Keurboomstrand, Plettenberg Bay, will create work opportunities during the construction and operational phase of the project. The intention is to promote female participation in the construction and operational phase.

The proposed project's focus is on using local labour and local professionals in all phases of the project. Approximately 80-90% of the workforce during the construction phase will be locally sourced, with approximately 90-95% of the workforce employed from the local area during operational phase of the development. Skilled and unskilled job opportunities will be created during the construction phase of the project, of which some will become permanent opportunities once the development is in the operational phase.

Small, Medium and Micro Enterprises (SMME) subcontractors will be used. The value of the combined construction phase of the different houses and infrastructure thereof is estimated to be approximately R50-75 million. Approximately 20-30% of jobs will be created for SMME contractors.

Depending on the skills available, all phases of the project will source locally skilled and unskilled contractors. Material suppliers for the project will be largely local suppliers from Plettenberg Bay and the surrounding areas. Local consultants from various specialised fields will be used, which will include:

- A town planner
- Civil engineering services and consultants
- Electrical design consultants and contractors
- Sales personnel
- Landscaping architects
- Structural engineers
- Conveyancers
- Environmental consultants etc.

In Table 11 the estimated temporary and permanent employment opportunities during construction and operational phase of the project for skilled and unskilled workers is indicated.

The job opportunities created with this project will allow further economic growth and development for these individuals and businesses, while benefitting their families. With occupation of the development, additional work opportunities will be created by owners who are likely to employ domestic workers, service providers, garden services and security guards etc.

Sustainable and effective spatial redress is best achieved through comprehensive spatial planning initiatives that align with national, provincial, and municipal development frameworks and cannot effectively be applied to every individual erf in a municipality.

The property in question is situated in Keurboomstrand, a predominantly high-income and historically advantaged area, far removed from previously disadvantaged communities and public transport opportunities. Development in such areas cannot inherently contribute to transformation or social equity unless it includes mechanisms for subsidised housing and targeted socio-economic upliftment which is normally government driven. Introducing such measures in an area like Keurboomstrand is unlikely to be practically feasible or locally supported.

In this instance the proposal has been found to be compatible with the Spatial Development Framework for Bitou which has identifies other areas suitable for integration. The Socio Economic Statement submitted with your application confirm how the project supports economic empowerment for historically disadvantaged groups by stimulating economic growth, job creation and skills development (Comment by Planning Space Town planning and Regional Planners).

Familie Roux Eiendomme owns the property and will be implementing the development as a family owned business. Upliftment initiatives for Historically Disadvantaged Individuals (HDI) will be by means of training programs, mentorships and transportation support to HDI employees. The applicant does not have a BBBEE status.

c) Efficient and Beneficial use of Water in the Public Interest

In terms of the improvement and enhancement of the economy the proposed housing development will provide both temporary and permanent employment opportunities and contribute to the local economy. The water use in this case is Section 21 (c), 21 (i), 21(e) and 21(g) for the development of the housing estate within 100 m of the spring. The people that will benefit from the water uses will be the community of Keurboomstrand, since many jobs will be created for locals both during the construction and operational phase of the housing development.

The proposed development occurs adjacent to a natural spring and pond, which are small in extent and can be protected from the development during construction and operational phases by

implementing the 20m wildlife corridor, and 10m buffer proposed by the aquatic specialist The sensitivity of the site is not increased to Very High due to the presence of this feature and has been excluded from the development in the SDP (Aquatic Report, Appendix 1)..

The preferred SDP (Figure 3) is supported due to lower density and less associated impacts to wildlife utilising the green corridor and areas beyond. However, this has more relevance for the sustained use of the spring for wildlife, as opposed to protecting the spring from development-associated impacts. It is recommended that Unit 50 be removed to improve connectivity along the green corridor as this unit currently blocks the area with the adjacent property to the east.

In this instance the proposal has been found to be compatible with the Spatial Development Framework for Bitou which has identifies other areas suitable for integration. The Socio Economic Statement submitted with your application confirm how the project supports economic empowerment for historically disadvantaged groups by stimulating economic growth, job creation and skills development (Comment by Planning Space Town planning and Regional Planners).

By implementing the recommended monitoring network and mitigation measures outlined in the Geohydrology report, the risk of groundwater contamination during both the construction and operational phases can be reduced to negligible - negative. This will ensure that groundwater quality is continuously protected and that any potential issues are addressed promptly, safeguarding the health and sustainability of the surrounding ecosystem and water users (Geohydrology report, Appendix 14).

d) Socio-economic Impact

Housing for a growing population is becoming increasingly important on a global, national and local level. Building houses not only creates part-time employment during the construction phase, but also ensures permanent work opportunities, which in turn create downstream employment opportunities.

This project is expected to contribute approximately R35 million to the economy through:
Seasonal contract work – R2-3 million
Permanent work – R1-2 million
Direct costs to local suppliers – R20-30 million.

Permanent direct and indirect work, such as domestic workers as well as skilled vocations such as plumbers and electricians are created with the construction of the development. Indirect job opportunities will also be created during operational phase when homeowners enter into contracts with local service providers such as fibre contracts, delivery services etc.

The estimated annual income, either through direct or indirect job creation, is expected to benefit the local Keurboomstrand community and surrounding areas. People who will be employed for this development will consist of skilled and unskilled workers, providing opportunity for different social areas to be uplifted by means of employment.

The expected costs and income which will be generated by this development:

- The total cost for this project is expected to be R250 million.
- The expected annual income created by the development is approximately R5-10 million, for labourer jobs, consultants employed, materials bought and capital investment.
- A total of ±R75 million is expected to be for employment during construction.

Socio-economic impacts are expected to be positive, by reducing unemployment within the local municipality of Bitou, benefitting the local economy as well as living conditions of the community. Failure of this project to be approved will result in loss of employment opportunities listed in Table 11 below.

Sustainable and effective spatial redress is best achieved through comprehensive spatial planning initiatives that align with national, provincial, and municipal development frameworks and cannot effectively be applied to every individual erf in a municipality.

i) Of Water Use(s) if Authorised:

The development of the housing estate will create not only part-time employment during the construction phase, but also ensure permanent work opportunities once it is operational. The estimated job opportunities that will be created is summarised in Table 11 below.

Table 11: Employment opportunities created by the Matjes Fontein Estate development

Job Opportunities	Number of Job Opportunities	Type of employment
Temporary jobs		
Skilled	*20-30*	Engineers, Architects, Project managers etc.
Unskilled	*100-150*	Temporary labourer
Operational	*5-10*	Maintenance
TOTAL	**125-190**	
Permanent jobs		
Skilled and unskilled	*30-45*	Property management, security and domestic workers

The contribution to the municipality due to the development by means of development fees, rates and taxes is envisaged to be approximately R1-2 million, which can be used to support a range of municipal services. The expected annual contribution to the economy by direct and indirect work being created, is estimated to generate a spending turnover of at least R35 million.

The development will help to reduce unemployment within the local municipality of Bitou, benefitting the local economy and wellbeing of the living conditions of the community. Failure of this project to be approved will result in the loss of employment opportunities as listed in Table *11* above.

Bitou Municipality supports the construction of the proposed housing development and confirmed that civil services will be available for this development with proposed upgrades (Appendix 3 and Appendix 8).

ii) Of the Failure to Authorise Water Use(s):

Failure to authorise the water use of the proposed Matjes Fontein Estate, will forfeit the economic benefits to the local area as well as local people who can benefit from work opportunities during the construction and operational phase of the project.

e) Any Catchment Management Strategy applicable to the relevant Water Resource

The dynamic nature of local, national and global environments constantly present local government with new challenges and demands. Similarly, the needs and priorities of the local communities within Plettenberg Bay are ever-changing. This presupposes greater co-ordination and integration with other external stakeholders such as national and provincial government, business community and civil society.

The Keurbooms Estuary resource quality objectives indicates that the key threat to the system includes barriers to flow and movement of fauna within the system, alien invasive vegetation in the catchment, habitat loss and modification, reduction in freshwater runoff and disturbance caused by recreational activities.

The Bitou municipality's vision is to *'partner with communities and stakeholders to sustainably deliver quality services so that everyone in Bitou can live and prosper together'*. Economic development and job creation is one of the strategies of Bitou Municipality, which is stipulated in the IDP 2022-2027. Although not a function of the municipality, they are obligated to create an environment for

economic growth and job creation. Their strategy is to create a safe environment for investors and develop investor friendly policies. Their plan is to support township tourism and other SMME ventures.

The proposed development occurs adjacent to a natural spring and pond, which are small in extent and can be protected from the development during construction an operational phases by implementing the 10 m buffer proposed by the aquatic specialist The sensitivity of the site is not increased to Very High due to the presence of this feature and has been excluded from the development in the SDP (Aquatic Report, Appendix 1)..

Application for the WUL and the implementation of associated licensing conditions such that the Reserve and Resource Quality Objectives are met is linked directly to Strategic Area 1 of the BOCMA management strategy:

"Protecting People and Nature as well as sharing for Equity and Development."

The WUL application process has been implemented to ensure that water use activities are authorised in a manner that achieves these broad mission statements, particularly the mission of ensuring healthy water resources and allocating water for all for ever.

f) Likely Effect of the Water Use to be authorized on the Water Resource and on other Water Users.

In terms of potential impacts to the spring and excavated pond, the likely effect of authorizing the water use is expected to have a very low impact and was assessed as a Low Risk according to the aquatic ecologist. The spring and pond will be designated no-go areas during construction and will be fenced off within the wildlife corridor during the operational phase of the development. Therefore, minimal impacts and effects to the spring are expected.

There are no estuarine features in terms of vegetation or habitat that were identified on the property, therefore there will be no effect of the development on the estuary as a water resource.

To ensure groundwater quality is maintained and monitored, 2 groundwater spikes / wells at 10m depth will need to be drilled (as per Aquatic report Appendix 1), to monitor the groundwater on the upland area and near the spring buffer. The wells should be located 200m apart with easy access during both the construction and operational phase. The Geohydrology report also provided instructions and mitigation measures to monitor groundwater quality and levels by means of Piezometers (see Table 8 above).

SuDS-type features will be implemented for the stormwater management of the property. Due to the flat surface area of the site, underground stormwater pipes will not be feasible. Poise Structural & Civil Engineering Consultants provided measures to be taken to control stormwater of the development and advised that the permeable condition of the site allows rainwater to infiltrate. During the development phase excess discharge will be contained within the stormwater detention ponds. Three catchments and ponds were identified (Figure 7), to cater for 24-hour runoff volumes of a 1:50-year interval rainfall. Stormwater discharge from road areas will be to the retention ponds, by percolating through permeable paving allowing regulatory SuDS reduction specifications (Civil Engineering Report, Appendix *5*).

The development will occur outside of the delineated area of the spring and pond and in addition to the 10m buffer around the pond, a 20m wildlife corridor will be established along the base of the steep slope of the property to allow for sustained movement for animals and access to the water of

the pond. This 20 m corridor also protects the slope base in terms of groundwater recharge which is an important function of this zone (Aquatic Report, Appendix *1*).

Emergency measures will be put in place to ensure that the treated effluent from the package plant can be contained for 48 hours, should it not be suitably treated for irrigation purposes. If required, after the initial 48-hour emergency period, the municipal treatment works will be contacted to remove the effluent if it cannot be re-circulated. An automated alarm system will notify the personnel when there is a problem with the treatment works (Civil Engineering Report, Appendix 5).

As per Poise Engineering, the 3 attenuation ponds will be designed to ensure no overtopping under 100 year RI storm conditions. In the highly likely event of such conditions being exceeded the overflow will reach the Keurboomstrand Road Reserve. There will however not be any impact more severe that under the current natural state.

The preliminary designs indicate that the bottom level of the ponds will all be in excess of 1,5m above the groundwater level.

The site levels will be reshaped to drain toward the stormwater ponds, and the surrounding pond catchment crest levels will be designed such that the overall site flood storage volume is not reduced from that of its current natural state. The site will continue to serve as a soakaway.

The Development stormwater management plan mitigates the impact of flood conditions for the Development and ensures that the Development will not negatively impact on surrounding properties under flooding conditions (Poise Engineering Responses to Engineering Comments, Appendix 17, point 8.5.1 in the document)

g) Class and the Resource Quality Objectives (RQO) of the Water Resource

Portion 91/304 Matjesfontein is in the Gourtiz catchment, in quaternary catchment K60E. Part of the property is located within the mapped Estuarine Functional Zone (EFZ) for Keurbooms Estuary (Figure 1). The only watercourse present at the site is the spring and associated excavation which acts as a small pond/dam. The 1:100 year floodline of the Keurbooms Estuary is located across the Keurboomstrand Rand road south of the property.

RQO's are defined as clear goals (numerical or descriptive statements) relating to the quality of a water resource and are set in accordance to the management class for the resource to ensure the water resource is protected. The purpose of RQO's is to set clear objectives for the resource against which water use licenses and the related impacts can be evaluated and managed to achieve a balance between the need to protect and utilise the resource.

The quaternary catchment falls within the G15 Coastal Integrated Unit of Analysis (IUA). The Water Resource Class for this IUA is II, indicating moderate protection and moderate utilisation, with a Present Ecological State (PES) of B and a Target Ecological Category (TEC) of B. The RQO report indicates major threats to the estuary as encroachment from existing and proposed land uses, and minor impacts from a proposed dam may occur in the future. Invasive alien vegetation on the floodplain was also a listed threat. The report predominantly focusses on the Tshokwane wetlands which are impacted by extensive existing and proposed development and encroachment, draining, alien plants, and roads. The proposed development will in no way affect flows into or out of the Keurbooms River or estuary. One of the RQO narratives states that concentrations of pathogens in the Keurbooms Lagoon should be maintained in a category suitable for full contact recreation. This emphasises the importance of monitoring pathogens such as *E. coli* and *Enterococci* in groundwater, as limited municipal WWTW capacity means that most new developments will be making use of package plants and irrigation with treated wastewater. It is highly unlikely given the low volumes for

irrigation in this development, along with its significant distance from the lagoon that it would influence pathogens in the estuary.

h) Investments already made and to be made by the Water User in respect of the Water Use in question

Significant investments have already been made in the acquisition of the property, appointment of contractors and various environmental authorisation and planning development processes in excess of R10-15 million.

i) Strategic Importance of the Water Use to be authorised

The Bitou Integrated Development Plan (2022-2027) has seven strategic objectives. Three of these are applicable to the proposed new development:

- *Re-establish, grow and expand tourism within the municipality*
  This development contributes to this objective by attracting more people to either move to Keurboomstrand or rent the newly built houses as holiday accommodation, which supports the tourism industry locally.
- *Facilitate growth, jobs and empowerment of the people of Bitou*
  This is enhanced by the development through job creation and expanding the number of residents in the municipal area who will spend money locally.
- *To build institutional and financial sustainability*
  Providing direct, permanent employment to skilled and unskilled people will provide financial support to families.

Some of the strategic objective focus areas of Bitou municipality fall under Town Planning, where interventions in land use management (development control), spatial planning, compliance motoring, SMME contractor support and informal trading forms part of it. The Municipality is a major role player in development planning, where people's needs and priorities must be considered and linked with national guidelines. The development strategies of Bitou Municipality are focused on delivering the expected outcomes of the local development mandate.

The proposal has been found to be compatible with the Spatial Development Framework (SDF) for Bitou which identifies other areas suitable for integration. The Socio Economic Statement submitted with the application confirms how the project supports economic empowerment for historically disadvantaged groups by stimulating economic growth, job creation and skills development. The SDF also confirms that all land development applications for the use of land abutting an urban edge should be considered consistent with the SDF if the land has at any time in the past been used or designated for any urban development, which includes all development of land where the primary use of the land is for the erection of structures. In this case, the land was previously approved for a resort with 50 units, this has also been acknowledged in the Keurboom Local Environs Spatial plan (see table D3).

The proposed development will create a significant number of employment opportunities (Table *11*). Work opportunities have already been created in the planning phase with land surveying, as well as the employment of numerous and various local professionals, including but not limited to town planners, environmental specialists, architects, heritage consultants and engineers.

Should this water use be authorised, it will create the opportunity for medium-high income earners to contribute to the wealth of people in the area from disposable income that will be spent in the

area. Rental opportunities within the homes will also encourage new visitors to the area, contributing to the local economy.

j) The Quality of Water in the Water Resource which may be required for the Reserve and for meeting International Obligations

It is not foreseen that there will be a significant impact on downstream water quality or quantity in the adjacent spring and pond. This development will not be taking water from a watercourse and Bitou Municipality has sufficient raw water for the development with the implementation of upgrades (Municipal Bulk Civil Services, Appendix *3***.**). Therefore, the ecological reserve in terms of water quantities is not applicable in this case.

Mitigating measures that have been recommended by the Aquatic specialist (Appendix *1*), including the buffer around the pond and on-site stormwater management, aim to ensure that the water quality is maintained during the construction and operational phases.

By implementing the recommended monitoring network and mitigation measures as prescribed in the geohydrological report, the risk of groundwater contamination during both the construction and operational phases can be reduced to negligible - negative. This will ensure that groundwater quality is continuously protected and that any potential issues are addressed promptly, safeguarding the health and sustainability of the surrounding ecosystem and water users. See mitigation measures as outlined herein under section 4.5 and 4.9 (DHS Groundwater, Appendix 14).

k) Probable duration of any undertaking for which a Water Use is to be authorised

The duration of the project's water uses is permanent.

18. Appendices

Appendix 1 – Aquatic Specialist Report

Appendix 2 – Historic existence confirmation of fountain and pond by old resident

Appendix 3 - Bulk Civil Services provision letter from Bitou Municipality

Appendix 4 – GLS Consulting (Pty) report

Appendix 5 – Poise Civil Engineering Services Report

Appendix 6 – Activated Sludge handling of the Bio Sewage System

Appendix 7 – Bio Sewage System Treatment plant Method statement

Appendix 8 - Municipal letter to confirm WWTP may be operated on a temporary basis

Appendix 9 – Poise Engineering Services DWG 23G210S01 Rev F-Layout1

Appendix 10 – Poise Civil Engineering Services Stormwater management data table

Appendix 11 – Planning Scope Diagram 10

Appendix 12 - Poise Engineering Stormwater Data Table

Appendix 13 – Public Participation report

Appendix 14 – DHS Groundwater, Geohydrology report

Appendix 15 – Poise Engineering Catchment Figure 1

[END OF WULA SUMMARY REPORT]