



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X16, SANLAMHOF, 7532, 52 Voortrekker Road, Bellville, Tel: 021 941 6000, Fax: 021 941 6070

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) (THE ACT)

I, **Mrs NM Bila-Mupariwa** in my capacity as Provincial Head Berg-Olifants - Belville in the Department of Water and Sanitation and acting under the powers delegated to me by the Minister of Water and Sanitation, hereby authorises the following water use in respect of this licence.

Serial Number : 4926374765288477166

Provincial Head

Date: Aug 29 2022 12:02PM

LICENCE NO: /G22C/CI/8810

FILE NO: 27/2/2/G322/42/3

REF. NO: WU8044

- 1. Licensee:** **Protea Village Communal Property Association**
Postal Address: 367 2nd Avenue
Lotus River
7941
- 2. Water Uses**
 - 2.1 Section 21 (c) of the Act: Impeding or diverting the flow of water in a watercourse.
 - 2.2 Section 21 (f) of the Act: Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit.
 - 2.3 Section 21 (i) of the Act: Altering the beds, banks, course or characteristics of a watercourse.
 - 2.4 Section 21 (j) of the Act: Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- 3. Properties in respect of which this licence is issued**

3.1 ERF 212, BISHOPSCOURT (Cadastral Code: CO1600040000021200000)

4. Registered Property owner

Table 1: Registered owners of the Properties

Property Name	Property Owner	Title deeds number
ERF 212, BISHOPSCOURT	City of Cape Town (CoCT)	T33794/1974
ERF 69, BISHOPSCOURT	City of Cape Town (CoCT)	T33794/1974



5. Licence and Review Period

This licence is valid for a period of twenty (20) years from the date of issuance and it may be reviewed at intervals of not more than five (5) years.

6. Definitions

Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998 as amended) shall bear the same meaning when used in this licence.

“The Provincial Head” means the Head of the Department’s Western Cape Provincial Operations. Department of Water and Sanitation, Private Bag X16, Sanlamhof, Bellville, 7532.

“Extent of the watercourse” means the outer edge of the 1:100-year flood line or the delineated riparian habitat, whichever is the greatest.

“Regulated area of a wetland” is the use of water in terms of sections 21(c) and (i) of the National Water Act within a 500 m radius from the boundary of any wetland.

“A wetland” means any land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

“The characteristics of a watercourse/s” mean the flow regime, water quality, habitat (including the physical structure of the watercourse/s and associated vegetation) and biota found within the extent of the watercourse/s. The Resource Quality characteristics as defined in the National Water Act, 1998 (Act 36 of 1998 as amended).

“Responsible Authority” means, in relation to a specific power or duty in respect of water uses, means – if that power or duty has been assigned by the Minister to a Catchment Management Agency or if that power or duty has not been assigned, the Minister through the Department of Water and Sanitation.

7. Description of activity

The proposed activity entails infilling of wetlands to allow for sufficient space for the proposed development, construction of sewer pump station within 500m of a wetland and spring and within 100m of a Liesbeek River, stormwater attenuation pond and discharge Liesbeek River, dewatering of groundwater from wetlands and discharge into Liesbeek River and proposed site bordered by Liesbeek River (1:00 year floodline). A residential development is proposed on Erf 242 & Erf 212, Bishopscourt. The residential development will be comprised of Green Public Open Space Areas; Residential Area for the 86 families (Protea village Communal Property Association: Claimants) of the Protea Village Community and associated services infrastructure; and A combination of Freehold and Leasehold Residential Opportunities and associated services infrastructure. The services to the Residential area will be provided by City of Cape Town (CoCT).

The propose Protea Village Residential Area will take place on Erf 212, Bishopscourt within the City of Cape Town (CoCT) local municipality, Western Cape Province. The Residential area will be situated in G22C Quaternary Catchment within the Salt River Catchment, within



Provincial Head

the Berg-Olifants Water Management Area. The geographic location of the property where the water uses will take place are 33°59'15.70" S; 13°26'20" E



APPENDIX I

General Conditions for the Licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998 as amended).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Provincial Head of any change of name, address, premises and/or legal status.
4. If the property in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Provincial Head within 60 days of the said change taking place.
5. If a Water User Association is established in the area to manage the resource, membership of the Licensee to the Association is compulsory. Rules, regulations and water management stipulation of such association must be adhered to.
6. The Licensee shall be responsible for any water use charges and/or levies imposed by a Responsible Authority.
7. While effect must be given to the Reserve as determined in terms of the Act, where a lower confidence determination of the Reserve has been used in issuance of this licence, the licence conditions may be amended should a higher confidence reserve be conducted.
8. The licence shall not be construed as exempting the Licensee from compliance with the provisions of any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other provisions of the Act, as amended from time to time.
10. The Licensee shall conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Provincial Head within one month of the finalization of the audit.
11. The Licensee shall appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence. Both these audits may be subjected to external audit.
12. Any incident that causes or may cause water pollution must be reported to the Provincial Head or a designated representative within 24 hours.
13. The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of / amongst other things.
 - 13.1 Shortage of water;
 - 13.2 Inundation of flood;
 - 13.3 Any *force majeure* event.



APPENDIX II

Section 21(c) of the Act: Impeding or diverting the flow of water in a watercourse and

Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse

1. GENERAL

1.1 This licence authorises Protea Village Communal Property Association (Protea Village) for Section 21(c) and (i) water use activities for the construction facilities as set out in Table 1 within quaternary catchment G22C and in the water use licence application reports submitted to the Department (refer condition 1.2):

Table 1: Water Use Activities

Water use(s) activities	Purpose	Property Description	Co-ordinates
Section 21 (c & i)			
Infilling of a wetland for development (Relic Wetland 6)	Ground stabilisation to develop a residential development	Land Parcel 212 of the Minor Region Bishopscourt	Lat : -33.98705 Lon : 18.43771 Lat-33.98705 Lon: 18.43771
Complete infilling of a wetland for development Erf 212 (Relic Wetland 8)	Ground stabilisation to develop a residential development.	Land Parcel 212 of the Minor Region Bishopscourt	Lat-33.988502 Lon- 18.43745 Lat- -33.9885 Lon- 18.43745
Infilling the watercourse for development on Erf 212 as well as Reshaping a portion of the Watercourse as part of stormwater attenuation ponds (Seep)	Partial infilling resulting in changes to flow and the bed of a seep, which is connected to a spring. Ground stabilisation to develop a residential development.	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.987461 Lon-18.441239 Lat-33.9874613 Lon-18.4412390
Partial Infilling of watercourse on Erf 212 (Wetland 9)	Partial infilling	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat: -33.987461 Lon: 18.441239
Construction of stormwater Pond: Impeding Seep Flow (Stormwater Attenuation Ponds (x 2)	to provide stormwater treatment services to the proposed residential development of Erf 242 and Erf 212	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.9875 Lon-18.441 Lat-33.9875 Lon- 18.44107
Construction of stormwater Pond Outlet 1 Erf 212 (Daylighting of a stormwater outlet)	To discharge treated stormwater	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.98799 Lon- 18.441316 Lat- -33.98799 Lon- 18.44131



Water use(s) activities	Purpose	Property Description	Co-ordinates
Construction of Storm water Outlet 2	To discharge treated stormwater	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.987828 Lon- 18.44162 Lat-33.987828 Lon- 18.44162
Construction of Swale Outlet 1 on Erf 212	To discharge treated stormwater	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.988328 Lon- 18.43927 Lat- -33.98834 Lon- 18.43925
Construction of Swale Outlet 2 on Erf 212	To discharge treated stormwater	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.9886122 Lon- 18.439284 Lat- -33.988612 Lon- 18.439284
Diverting Flow of Seep 1 into the Liesbeek (Stormwater Ponds and Infill) via Outlet 2)	provide stormwater drainage for the proposed residential development of Erf 242 and Erf 212	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.988613 Lon- 18.43928
Construction of Stormwater Pipe Outlet 2 on Erf 212 (Diverting Flow of Seep 1 into the Liesbeek as a result of infilling for residential stands and parking area)	Developing stormwater and ifilling of wetland for construction of parking area and residential stand	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat-33.98765 Lon- 18.43802
Construction of Sewage pump station within 500m of a wetland and spring, and within 100m of a river	To pump sewage from residential are to municipal sewer	Land Parcel 212 of the Minor Region BISHOPSCOURT	Lat: -33.988583 Lon: 18.438444

1.2 The Licensee must carry out and complete all the activities listed under condition 1.1 according to the following:

1.2.1 Reports submitted to the Department or the Provincial Head, specifically:

- 1.2.1.1 Liz Day (Dec 2019). Specialist Aquatic Ecosystems Report Input into the Basic Assessment Process to assess the Environmental Implications of the proposed Protea Village Residential Development on Erven 212 and 242, Bishops court, Cape Town
- 1.2.1.2 Kantey and Templer Pty (Ltd) (October 2016). Report On Geotechnical Investigation for Proposed Protea Village Development Bishops court
- 1.2.1.3 Greame McGill Pty (Ltd) (July 2018). Stormwater Management Plan for the Proposed Residential Development, Protea Village On Erven 212 And 242, Bishops court
- 1.2.1.4 Digital Soil Africa. Protea Village Development Geotechnical Report Review
- 1.2.1.5 Chand Environmental Consultants (Oct 2020). Draft Final BAR for Proposed Development Of Residential And Recreational Facilities On Erven 242 And 212, Bishops court For The Protea Village Community Land Claim: Phase 1



- 1.3 Conditions of this licence; and any other written direction issued by the Provincial Head in relation to this licence.
- 1.4 No activity must take place within the 1:100 year flood line or the delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised by this licence.
- 1.5 The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of these activities and the Licensee must take such measures that are necessary to bind such persons to the conditions of this licence.
- 1.6 A copy of the water use licence and reports set out under condition 1.2 of this Appendix must be on site at all times.
- 1.7 A suitably qualified person(s), appointed by the Licensee, and approved in writing by the Licensee, must be responsible for ensuring that the activities are undertaken in compliance with the specifications as set out in reports submitted to the Department or the Provincial Head and the conditions of this licence.
- 1.7.1. A master layout plan overlaying sensitive features and proposed activities must be submitted for approval prior commencement of the activity.

2. LICENCE SPECIAL CONDITIONS

- 2.1 The rehabilitation, maintenance and management of the watercourses identified, together with their allocated buffer areas, must ensure for functioning ecosystem services, habitat and biota diversity through ensuring the Recommended Ecological Category (REC) for each of the identified watercourses are met and sustained.
- 2.2 All activities relating to the various construction method statements, stormwater management, rehabilitation, maintenance and management of this development must be submitted and approved (signed and dated) by the project freshwater specialist prior to commencing with the relevant activities.
- 2.3 The preferred alternative, referred to in Figure 3.1 A is supported must be adhered to.
- 2.4 A fifteen meters (15 m) minimum setback must be implemented from the active channel to the closest building line. This setback must be demarcated prior to construction with care being taken not to damage this area. Please note that steep inclines must be avoided to ensure hydrological functioning of the watercourses.
- 2.5 A minimum 10m setback between the outer (western) temporary to seasonal zone of the spring and the nearest erf boundary – note that the delineated wetland seep 1 , in fact extends 15-18 m west of the spring area; and 10 - 12 m north of the spring. There is thus a minimum area of 14 m between the outer edge of the temporary wetland and the closest property boundary to the north and a minimum area of 10m between the temporary wetland edge and the closest property boundary to the west, with an additional building setback within the northern and western properties of 3m and 5m respectively. Please note that these setbacks must be implemented prior to the commencement of construction.



- 2.6 The presence of the two proposed dry attenuation ponds (SWP1 and SWP2) are supported.
- 2.6.1. The following is applicable to SWP1:
- 2.6.1.1. This pond will be fed by runoff from sub-catchments SC2, SC3, SC7 and SC4.
 - 2.6.1.2. This runoff will enter a 120 m² x 1 m deep forebay, and then enter SWP1, where runoff up to the 1:5 year storm recurrence interval (RI) will be attenuated and discharged into the Liesbeek River through a 450mm pipe at Outlet 1.
 - 2.6.1.3. At the 1:5 year RI storm depth, stormwater will be discharged into pond SWP2 over a 10 m wide spillway.
 - 2.6.1.4. Underdrains have been proposed to reduce dry season wetness – these will pass out of Outlet 1.
- 2.6.2. The following is applicable to SWP2:
- 2.6.2.1. This pond will be managed to be drier than SWP1.
 - 2.6.2.2. Runoff from SC8 will enter the pond, via a 16 m² x 1 m deep forebay.
 - 2.6.2.3. Runoff from SC8 will be attenuated up to the 1:5 year RI and pass into the Liesbeek River via Outlet 2.
 - 2.6.2.4. For recurrence intervals up to 1:50 year, runoff from SWP2 and SC8 will be attenuated through a set of orifices on Outlet 2.
 - 2.6.2.5. A 10 m wide spillway must allow for passage of flows at the inundation depth of the 1:50 year storm for larger storms.
 - 2.6.2.6. Underdrains have been proposed to reduce dry season wetness – these will pass out of Outlet 2.
 - 2.6.2.7. The pond must be landscaped to allow use as an amenity area during the summer months.
- 2.7 An approved method statement, which must be approved by the project freshwater specialist, must be submitted to this Department prior to the commencement of dewatering, to indicate how the high water table across the sites will be managed. Please note that water being dewatered must be allowed to settle before being discharged into the watercourses downstream.
- 2.8 An approved method statement regarding the use of floating foundations as opposed to cutting into the slope, must be submitted to this Department after the issuance of this License but prior construction. Please note this method statement must be signed by the freshwater specialist before being sent to this Department for approval.
- 2.9 Stabilisation of near-vertical undercut banks on outside river bends along the sections of Window Stream, must take place by placing large boulders and smaller cobble riprap against the undercut area, and establishing Palmiet stands in the wetted zone between the river and these areas, to provide additional roughness and scour protection.

- 2.10 Stabilisation of sections of bank that are subjected to erosion higher up the bank by the use of gabion revetments, stepped and designed to include planting zones on each step, stepped 1m high x 1.5m wide baskets are proposed with a 0.5m exposed wide step on each level, in which a planting area is created. Please confirm with project freshwater specialist prior implementation.
- 2.11 Shaping of the top of the river banks by gently “stepping” them up where space allows, to achieve gradients of 1:4 or less steep, to facilitate establishment of plants and improve connectivity between the river and adjacent open spaces must be achieved under the supervision of the project freshwater specialist and associated signed method statement, prior to implementation.
- 2.12 Removal of large logs / fallen trees as required to prevent them obstructing flow and causing erosion. This must be done as part of the rehabilitation of the properties.
- 2.13 Removal of root bolls where necessary, where these obstruct flow, prevent rehabilitation by bank reshaping or constrict the channel must be done under the supervision of the project freshwater specialist.
- 2.14 Removal of collapsed bank material where it blocks flow and exacerbates river erosion must take place to ensure successful rehabilitation.
- 2.15 Remnant wetland function within seep 1 must be improved through the felling, appropriate (Working for Wetlands endorsed) stump treatment.
- 2.16 NEMBA listed woody alien trees must be removed within the seep and its buffer areas, where these have not been identified as of Heritage significance. Where trees are required for shade or aesthetic reasons, new trees must be planted in the riverine / spring areas. They must be locally indigenous species, and must not be species with any NEMBA listing. Furthermore, they must not be planted down the banks or in the active river channels.
- 2.17 The extents of both Pond 2 and Pond 3 must be expanded on their southern sides, through the creation of seasonally saturated wetland habitats, rather than open water areas. The actual area of expansion must be decided on during the detailed design phase of the project which must also be approved by the project freshwater specialist prior to commencement. Please note this detailed design phase must allow for the following elements:
- 2.17.1. Expansion must extend some 10-15 m south of the existing ponds;
- 2.17.2. This area must be shallowly excavated to create seasonally saturated and in places shallowly inundated (< 200 mm depth) wetland depressions;
- 2.17.3. Allowance must be made for planting of the areas thus created with locally indigenous vegetation appropriate to the habitats created;
- 2.18 The seep diversion channel must be excavated as a wide, shallow depression (some 1015 m wide), through which seepage from the spring, diverted via Pond 3 and possibly Pond 2, can create its own low flow channel – excavation of the channel must ensure that a heterogeneous landscape is created, with minor depressions and raised areas that mimic the existing swale / seep downstream of Pond 3.

- 2.19 The proposed stormwater pipeline to SWP1 would cross through the seep – its alignment must allow for it to cross beneath the seep so that it does not interfere with seep function.
- 2.20 An impervious lining must be installed in a north-south direction along the western bermed edge of SWP1, with the objective of preventing draw-down of water from the seep into the lower-lying stormwater pond.
- 2.21 Provision must be made for passage of pedestrians across the seep diversion channel without disturbing it / increasing erosion risk. Therefore, a method statement to establish the raised wooden boardwalk is required within three months after the issuance of this license but before the commencement of any activity.
- 2.22 Provision must also be made for the vegetation of the created seep, using locally indigenous wetland plant species, possibly sourced in part from existing wetland stock on site. This must be confirmed with the project freshwater specialist prior to the implementation thereof.
- 2.23 Where the seep passes into the Liesbeek River over the proposed bank stabilizing gabion weir, improved ecological connectivity between the two systems must be obtained by (and under the recommendations of the project freshwater specialist):
- 2.23.1. Ensuring that the proposed gabion baskets are fitted with bitem-lined, topsoil-filled planting areas within each gabion step;
 - 2.23.2. Ensuring that the lowest gabion step is inserted into the river bed, such that the top of the step is no higher than 200 mm above the dry season base flow level, so that plants installed on the step will have their roots within the water table;
 - 2.23.3. Planting of the gabion wall with Palmiet and other wetland plants on the lower level and with drought- and flow-tolerant species higher up the bank, where access to water is less frequent and where the gabion itself would promote drainage and increase summer heat stress as a result of the exposed rocks.
- 2.24 The value of the two stormwater ponds in terms of contributing to compensation for loss of wetland function and biodiversity / habitat value flow must be optimized through the following approaches, the details of which would be fixed in the detailed design phase of the project and must be completed under the supervision of the project freshwater specialist and must be managed as wetlands to ensure ecosystem functionality:
- 2.24.1. Test holes (or other appropriate monitoring tools such as soil moisture piezometers) must be dug during the detailed design phase, ideally extending over a full year, but at least allowing measurement of summer and winter water table levels in the area of the proposed stormwater ponds and upslope in the area that would pass water into these areas – this information will be used to feed into stormwater pond design and dictate the positioning of subsurface drains in the ponds – a detailed monitoring programme must be agreed on during the detailed design phase that allows for at least monthly measurement of water table level in the planned stormwater pond area and upslope – to the north and west in the wellpoint area – over a period that covers both dry and wet seasons.

- 2.24.2. The two wetland areas (ponds) must be designed such that they are dry (soil moisture content <22%) during at least four months of the year, and preferably longer, to reduce the (very high) likelihood of invasion of these wide, low-gradient to flat areas by *Typha capensis* – this means that subsurface drains must be installed that drain seepage water from the ponds during most of the year, to depths at least 400 mm below the soil surface.
- 2.24.3. At the same time, however, in order to use these areas to create wetland habitat that in some degree will compensate for the habitat lost to infilling, the drainage must be such that it accommodated dry season through-flows, but allows wet season buildup of water in these areas, such that, outside of major storms, the ponds create shallowly inundated pools of depth 100 – 300 mm that remain in the wetland over a few months – this must support seasonal wetland vegetation and be a potentially valuable habitat, provided that water quality is not compromised. The level of the orifices from SWP1 and SWP2 should be fixed with this in mind;
- 2.24.4. The wetland areas (ponds) must be shaped such that they do not comprise of homogeneous, flat habitat, but include a range of shallow depressions and low mounds (200 mm deep and 200 mm high respectively, with a total height range of 400 mm);
- 2.24.5. Allowance must be made for the planting of the wetland areas (ponds) with locally indigenous vegetation appropriate to the habitats created – Thus seasonal wetland vegetation is instead recommended, along with the incorporation of board walks through both stormwater pond areas, in the knowledge that these would be inundated during storm events;
- 2.24.6. The side slopes of both ponds must be gently sloped at gradients of 1:4 or less steep to allow their stabilization by vegetation – where space allows along the northern and western boundaries, this gradient must be flattened to 1:7 or even less steep, to allow a gradual blending of the surrounding open space with the stormwater attenuation areas.
- 2.25 Portions of the side slopes of the two forebays (SWP1 and SWP2) must be flattened to an angle of 1:4 or less steep, to allow fauna that might fall into these otherwise steep-sided areas to extricate themselves – such areas could also be used to permit access to the forebays for maintenance;
- 2.26 The outlets of the two stormwater ponds must be designed to maximize the establishment of seepage wetland habitat between the ponds and the Liesbeek River, and to improve connectivity between the open space / pond area and the river. The following is required:
- 2.26.1. Subsurface drainage pipes through the ponds must ideally outlet onto the river bank and be allowed to form wide seepage areas that lead over the proposed stepped erosion control gabion revetments, into the river;
- 2.26.2. Locally indigenous vegetation appropriate to establishment in permanent trickle flows of water must be sought for this zone, and must include indigenous tree ferns, sedges and other plant species– a botanical specialist must be consulted in this regard, in conjunction with the wetland ecologist / project freshwater specialist;

- 2.26.3. The spillway from SWP1 must be managed so as to incorporate a stepped gabion being used to confer stability but a boulder / rockfill feature being constructed to reduce velocities and ensure physical connectivity between the stormwater pond and the river, which would otherwise be separated by a steep gabion lined river bank and an additional gabion bank into the stormwater pond;
- 2.26.4. In the case of SWP2, the seep flows must be spread over the width of the gabion revetments proposed for the river in these reaches – the slow permanent trickle flows from this source must promote wetland plant growth in this otherwise hostile terrain.
- 2.27 Where overflows from SWP1 and SWP2 (including subsurface drains) pass into the Liesbeek River over the proposed bank stabilizing gabions, improved ecological connectivity between the two systems must be obtained through:
- 2.27.1. Ensuring that the proposed gabion baskets are fitted with bitem lined, topsoil-filled planting areas within each gabion step;
- 2.27.2. Ensuring that the lowest gabion step is inserted into the river bed, such that the top of the step is no higher than 200 mm above the dry season base flow level, so that plants installed on the step will have their roots within the water table;
- 2.27.3. Planting of the gabion wall with Palmiet and other wetland plants on the lower level and with drought- and flow-tolerant species higher up the bank, where access to water is less frequent and the gabion itself would promote drainage and increase summer heat stress as a result of the exposed rocks.
- 2.27.4. Final plant species selection must be based on observed functioning of the system over the first year after establishment;
- 2.28 The area north east of Pond 3, which will fall within the proposed development, must be infilled and landscaped such that flows passing out of Pond 3 do not pass into this naturally low-lying area, but are instead diverted into the new seep diversion channel. This means that the current outlet channel from Pond 3 must be infilled to levels above those likely to result in wetland establishment. The area downstream of this point must be infilled.
- 2.29 The introduction of an infiltration trench at the downslope end of the parking area is supported. This trench must not extend any closer to the wetland than the downslope edges of the properties on either side of the parking area, and will require at least two potential parking spaces to be replaced with an infiltration area – effectively within the 3 m setback allowed for in the adjacent plots.
- 2.30 The infiltration system must be designed by a stormwater engineer and in conjunction with the project freshwater specialist, to include allowance for temporary surface storage of runoff from the hardened surface, to allow for its passage into the infiltration area. The signed method statement must in place prior to the implementation thereof.
- 2.31 Subsurface drains from Stormwater catchment area SC7 must discharge into the upslope portion of the buffer area west and north of the mapped wellpoint at the head of seep 1.
- 2.32 This recharge area must be designed as an infiltration trench that runs the length of the buffer area west and north of the spring, as far east as and including the open space area

between plots 23 and 22. This trench must be designed and implemented as a vegetated swale to allow for the percolation of baseflow.

- 2.33 Subsurface drains from SC8 must be passed into SW Pond 2 and from here into the river to maintain summer flows through this system.
- 2.34 The buffer area between the parking area and the spring / Pond 1 area must be planted with locally indigenous shrubby plants that will substantially increase surface roughness and thus reduce flow velocities passing down the slope. The parking area itself must be designed to attenuate and discharge runoff into the infiltration trench recommended above, which must be designed in this area as a surface depression with sufficient capacity to attenuate all surface discharge upslope of the sensitive seep area.
- 2.35 The architectural design of the development itself must include mechanisms at the level of individual houses / plots from both Erf 212 and Erf 242 that will reduce the rate of discharge of stormwater – in the larger erven on Erf 212 at least, roofs must discharge into raingardens (or similar) or onto lawns, and not into a piped stormwater system leading to the roads.
- 2.36 The overland servitude EOE3 must be lined with reno rather than armourflex, with the reno set below the final surface and infilled /covered with topsoil to support low growing vegetation.
- 2.37 EO3 must also be routed to enter the river slightly further downstream of its currently proposed entry point, such that it enters the river on an inside rather than an outside bend.
- 2.38 EO6 and EOE7 must similarly not be lined with armorflex at their outlets into the rivers. Shallowly stepped gabions, with allowance for vegetation on each step must be implemented to pass high flows over the river bank without risking significant erosion.
- 2.39 Measures to address the existing river bed and bank erosion in the river in these reaches must be implemented to improve resilience. Essential measures that must be addressed as part of bulk services (that is, to ensure improved resilience at the start of the project) must include:
- 2.39.1. Stabilization of the river banks with gabion baskets where required as part of installation of the stormwater outlets. Areas of essential placement of gabions must be approved by the project freshwater specialist prior to the implementation.
- 2.39.2. Stabilization of the right hand river bank in the upper reaches of Window Stream using gabion baskets, to prevent further erosion and bank slump in this area prior to construction.
- 2.39.3. Bank shaping and the installation of a low gabion weir at the point of channel incision just downstream of the existing pedestrian crossing on Window Stream, is supported, to prevent further incision and headcut erosion.
- 2.39.4. Bank shaping and planting where necessary along the two rivers as part of the bulk earth phase of the project, to allow them to tie in to the gabion outlet on a sustainable basis.



- 2.40 Measures such as the installation in places of a boulder lining along the undercut outside channel, edged on the channel side with Palmiet, must take place during bulk services and gabion construction.
- 2.41 Palmiet must be propagated for planting purposes, using local stock already in the channel.
- 2.42 Construction Phase Environmental Management Programme (CEMP_r) must be compiled, outlining activities and measures that must be implemented during construction to minimize negative environmental impacts during construction.
- 2.43 Implementation of the CEMP_r must be overseen by a suitably experienced Environmental Control Officer (ECO) and must be recommended and signed by the project freshwater specialist prior to the commencement of the activities.
- 2.44 The river and seep buffer areas must be fenced off using temporary mesh or other fencing that will act as an effective deterrent to the accidental or other passage of vehicles or personnel into these areas. Fencing must be on the upslope side of the buffer (i. e. along the boundary line of Area B), and fencing must be installed prior to the start of any on-site construction activities; the buffered seep and wetlands must be managed as “no go” areas during construction, other than where access is required for specified activities within these areas, in which case such activities must be carefully controlled by the ECO or project freshwater specialist.
- 2.45 The buffer areas must, as far as possible, be left undisturbed and with their vegetation intact. However, they must be subjected to rehabilitation, maintenance and management activities to ensure optimal ecological functioning as well as these areas acting as an ecological corridor to both flora and fauna.
- 2.46 Measures must be set in place for the collection of sediment-rich stormwater on Erf 212, upslope of any buffer areas – this stormwater must be contained so that it is passed in a controlled manner to the stormwater system, and its sediment load removed.
- 2.47 The passage of sediment-rich water into the Liesbeek River from Erf 242 must be strictly avoided, and temporary sediment traps must be constructed upstream of all stormwater outlet points from the site, and these traps must be managed and cleared as necessary.
- 2.48 The new stormwater ponds, pipeline to SWP1 between ponds 2 and 3 and new seep alignment must be constructed at an early stage in the development (i.e. as part of the Bulk Services phase), so that the ponds can play a role in sediment collection during construction.
- 2.49 The final gravel and sand infill into the enhanced swales along the two river channels must be completed only at a late stage in the development. This must be confirmed and completed under the supervision of the project freshwater specialist.
- 2.50 Appropriate dewatering measures must be in place before the start of construction and onsite containment of surface runoff must be maintained. Surface runoff from construction sites in Areas A, C, D and E must be into the detention ponds or alternative temporary ponds during construction, and these must be maintained with adequate removal of sediment throughout construction.



- 2.51 Any water discharged must be clear with no visible sediments or discoloration / cloudiness and no dewatering water to be discharged onto the buffer area west or north of the well point.
- 2.52 The efficacy of on-site sediment management must be monitored by carrying out comparative weekly turbidity measurements up- and downstream of the site, including downstream of the discharge from Erf 242 into the Liesbeek, downstream of the Kirstenbosch Drive River crossing. Where these data suggest sediment management is inadequate, additional measures must be implemented.
- 2.53 Construction activities involving disturbance of potentially wetted / saturated near-surface soils on Erf 212 must be timed to fall outside of the wet season, the period between 01 November and 30 April.
- 2.54 Landscaping and landscape planting after dry-season shaping must be planned to take place during the onset of the wet season.
- 2.55 Where access into the seep or rivers and their buffers is required, the limits of access must be clearly demarcated by the ECO and / or project freshwater specialist with a view to minimizing the extent of disturbance. Where possible, works must be undertaken using manual labour rather than machines – provided that this does not compromise the final outcome.
- 2.56 Excess soil (e.g. after pipeline installation) or other material left after construction within the seep or river or buffer areas must be removed and the area restored to its pre disturbance levels and condition or better – where necessary, compacted soils must be ripped and disturbed banks / surface areas reshaped and planted as required by the project freshwater specialist.
- 2.57 No refueling, vehicle repair, storage or fuel storage is to be allowed within 50 m of the fenced off buffers on Erf 212 or within 50 m of the sediment traps required at the stormwater outlets from Erf 242.
- 2.58 All refuelling areas and fuel storage areas must be adequately covered and bunded to control potential pollution sources.
- 2.59 No vehicles or machinery / tools are to be washed on site such that contaminated runoff can flow into the buffers and /or seep or rivers.
- 2.60 Adequate toilet facilities must be established and managed on site for use by construction workers.
- 2.61 Daily removal of litter from all construction areas on the site is required, as well as weekly removal of litter from the construction sites, identified watercourses and associated buffer areas.
- 2.62 Pathways or boardwalks must be included in the landscape plan such that they direct pedestrians away from the sensitive spring area and its transition into Pond 1, and either along the boundary between plots 22 -12 to the east, and /or via boardwalk between Ponds 2 and Pond 3. The exact alignment of these pathways and/or boardwalks to be confirmed on site between the landscape architect and the project freshwater specialist.



- 2.63 The proposed infiltration trench outlined must be implemented and the trench must be maintained in the long term so that infiltration function is retained.
- 2.64 Raised boardwalks (no wider than 1.5 m) must be included in the landscape design, to allow for low-impact crossings across the seep (in the re-aligned reaches downstream of Pond 3) and through SW Ponds 1 and 2.
- 2.65 The upper reaches of the seep must be protected from impacts such as pedestrian and dog passage.
- 2.66 The proposed parking areas abutting the northwestern buffer of the upper reaches of the seep must be fenced with permeable fencing (e.g. low pickets or palisade type fencing) to prevent pedestrian access down this section of the wetland.
- 2.67 Ponds 2 and 3 lie very close to (and in the case of Pond 3 is encroached into by) the proposed development. It is recommended that infilling of the northern margins of these two ponds must take place to create seasonally saturated wetland margins, grading into 10 m of terrestrial area, that will buffer the main water bodies from the adjacent areas. The 10 m buffer must be measured from the development edge and the required infill thus calculated. A compensatory wetland area equal to or greater than the area lost must be created on the other (southern) side of the ponds. This compensation must take place in parallel to the construction works.
- 2.68 Properties abutting the river and wetland corridors must be bounded with palisade-type fencing only; if concrete foundations are required for support poles, these must be limited to the support poles only with the remaining fence length between support poles being above the ground surface, so that subsurface flows are not blocked.
- 2.69 Plots on Erf 212 must be landscaped with locally indigenous vegetation – other than in the case of existing, non-invasive trees that have been itemised for retention.
- 2.70 A wooden bridge crossing must be considered for Window Stream, at the main pedestrian desire line, noting that the position of this desire line might change in a development context – the bridge must be designed to cross above the 1:50 year flood line, which roughly equates to the top of existing river banks. When this has been finalised, the method statement must be submitted to this Department for review prior to the implementation thereof.
- 2.71 The river and wetland ecological setbacks / buffers must be managed as follows:
- 2.71.1. No surface hardening (e.g. decks, lined pathways) to be permitted in these areas other than those outlined above (limited width boardwalk in some areas);
- 2.71.2. No paths or boardwalks to be permitted in the buffer area west or north of the mapped well point.;
- 2.71.3. Alien vegetation must be kept out of the buffers. All invasive alien trees listed in NEMBA as Category 1a, 1b, 2 and 3 must be removed where these occur in the rivers, wetlands and their buffer areas – this must take place as part of the initial bulk servicing of the site.



- 2.71.4. Establish indigenous plants with greater roughness (e.g. shrubs, restios, sedges) in the buffer areas, particularly north and west of the well point – the area extending from the well point up to the car park in particular must be planted with locally indigenous wetland and terrestrial species, to improve wetland resilience and buffer function.
- 2.72 Annual inspections of the rivers, wetlands and their buffers must take place by a suitably experienced aquatic ecologist or environmentalist, to ensure that the mitigation measures particular to this project are adequately implemented and that general best practice measures are adhered to along the river corridor.
- 2.73 Where active erosion of footpaths, boardwalks, other river or wetland crossings or any active watercourse erosion is evident, steps must be taken to stabilise the erosion, ensuring that the source or cause of erosion is identified so that it can be correctly addressed.
- 2.74 An Operational Phase Environmental Management Programme (OEMPr) must be drawn up that outlines the required frequency and type of management intervention on the sites, with regard to:
- 2.74.1. Management of buffer areas;
 - 2.74.2. Alien clearing;
 - 2.74.3. Erosion control and other measures for the seep and rivers;
 - 2.74.4. Monitoring plan for the identified watercourses.
- 2.75 Agreement must be reached prior to the commencement of construction as to the allocation of responsibility for management of waste, stormwater, service infrastructure and the open space areas on both Erf 212 and Erf 242, including the rivers and wetlands. Such allocations in part depend on agreements to be reached, or formal acknowledgement to be in place, between the City and the development team regarding which aspects must be implemented by the City, and which aspects must be the responsibility of the developer / future landowners. This agreement must be submitted to this Department within three (3) months after the issuance of this License but prior to the commencement of any activity.
- 2.76 The Operational phase Environmental Management Programme (OEMPr) must also outline the required frequency and type of management intervention on the sites, with regard to:
- 2.76.1. Checking and clearing of litter and sediment traps on both erven litter must be cleared from litter traps on a weekly basis;
 - 2.76.2. Checking and clearing of the forebays in SW Ponds 1 and 2;
 - 2.76.3. Maintenance of the enhanced swales on Erf 212;
 - 2.76.4. Clearing of litter, sediment and invasive or senescent vegetation from the two stormwater ponds themselves, so that their water quality amelioration function is maintained while allowing them to contribute to the amenity value of the area allowance must be made for clearing /cutting *Typha capensis* in the ponds, even though the planned subsurface drains in the ponds should reduce the summer time saturation that encourages these plants.

- 2.77 Allowance must be made for access to the forebays on SW Ponds 1 and 2 for regular (weekly) removal of litter and less frequent sediment removal.
- 2.78 Community engagement from both erven must take place to manage open spaces and ensure that these are kept litter free, and to report timeously on sewer leaks or visible pollution on the sites.
- 2.79 All residences must be made to conform in all aspects and on an ongoing basis with the City's town planning and engineering standards for this area;
- 2.80 A river monitoring point must be added to the City's routine monitoring sites in order to monitor water quality in the Liesbeek River downstream of Erf 212, as well as downstream of the Boshof Avenue stormwater inlet into the river below Kirstenbosch Drive. In the event that deterioration in water quality is observed, pollution tracking measures must be implemented and the source of degradation addressed.
- 2.81 No wellpoint or borehole abstraction targeting the primary (surface) aquifer should be allowed to take place from either Erf 212 or Erf 242, without a signed letter from a professional, independent geohydrologist with knowledge of the area, stating that such abstraction will not affect spring water supply.
- 2.82 No abstraction from surface waters on the site will be permitted. This applies to the rivers and the spring / seep.
- 2.83 An incident and / or pollution register must be kept for both the construction and operational phases of this project.
- 2.84 An operations and maintenance manual will be implemented and be available for the storm water attenuation ponds and sewerage pump station after approval of the water use licence but before construction commence.
- 2.85 The final storm water management plan approved by the local authority must be submitted with the construction drawings of the required facilities after approval of the water use licence but before construction commence.
- 2.86 The drawings for the excavation and stabilization to the Liesbeek River according to a MMP must be submitted after approval of the water use licence but before construction commence.
- 2.87 The Licensee shall within 30 days after the completion of the activities inform the Regional Head in writing thereof. It shall be accompanied by a signature of approval from the designer (Professional Engineer) that the construction of the storm water facilities was done according to the construction drawings.
- 2.88 A letter to confirming that there is sufficient capacity of waste water treatment works must be submitted prior commencement of the proposed activity.
- 2.89 The Licensee must ensure that all issues raised by all stakeholders must be addressed or resolved prior commencement of proposed activity.
- 2.90 The Licensee must ensure that land claim is resolved prior commencement of the activity.



- 2.91** A Section 21(c and i) stream stabilization water use licence application must be completed, signed and submitted to Department for approval.

3. FURTHER STUDIES AND INFORMATION REQUIREMENTS

3.1 For water use activities in Table 1:

3.1.1 Detailed design drawings of all the infrastructure of impeding and/or diverting flow of watercourses on the property must be submitted to the Provincial Head within three (3) months of date the issuance. The foregoing must indicate the regulated activities, marking the limits of disturbance in relation to the impacted watercourse; morphology of the watercourse; site specific impacts; and environmental management, particularly erosion and sediment, controls and measures;

3.1.2 No fundamental alterations of the site design plan(s) and drawings are allowed, unless a modification is requested and granted by the Provincial Head in writing; and

3.1.3 No site activities must occur beyond the proposed site location of the erosion and sedimentation controls and marked limits of disturbance.

3.2 If the Licensee is not the end user/beneficiary of the water use related infrastructure and will not be responsible for long term maintenance and management of the infrastructure, the Licensee must provide a programme for hand over to the successor-in-title including a brief management/maintenance plan and the agreement for infrastructure along with allocation of responsibilities, within three (3) months of the date of issuance of this licence.

3.3 An Environmental Management Plan (EMP) and rehabilitation plan for the decommissioning of any of the water use activities listed in Table 1 must be submitted five (5) years before commencing with closure to the Provincial Head for a written approval.

3.4 For all the activities listed under condition 1.1, Table 1, "as-built" plan(s) and engineering drawing(s) prepared by a registered professional engineer, must be submitted to the Provincial Head within three (3) months of the date of issuance of this licence. These plan(s) and drawing(s) must indicate the watercourse including wetland boundaries and layout and structure location(s) of all infrastructures a impeding and/or diverting flow of the watercourse as well as alterations to the watercourse on the property.

3.5 A Storm Water Management Plan must be updated and drawn up on A1 paper and submitted to the Provincial Head for written approval within 3 months of licence being issued. Clean water dirty water must be separated.

3.6 Storm Water management plan should be designed in a way that aims to ensure that post-development run-off does not exceed pre-development values in:

3.6.1 Peak discharge for any given storm,

3.6.2 Total volume of run-off for any given storm,

3.6.3 Frequency of run-off volumes,

3.6.4 Pollutant and debris concentrations reaching watercourses,

3.6.5 Demonstrate minimal soil and vegetation clearance practices,

3.6.6 Demonstrate an effective re-vegetation campaign for bare areas,

3.6.7 Velocity of outgoing storm water shall not exceed the velocities of incoming water in order to reduce erosion impacts, and



3.6.8 Increase in run-off due to a higher water table resulting from tree clearing practices.

4. PROTECTIVE MEASURES

4.1 Storm Water Management

4.1.1 Storm water management practices must be constructed, operated and maintained in a sustainable manner throughout the project and for the water use activities set out in condition 1.1 and must include but are not limited to the following:

4.1.1.1 Increased runoff due to vegetation clearance (promoting limiting vegetation clearance at all times) and/or soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the watercourse(s);

4.1.1.2 Storm water must be diverted from construction works, access roads, linear infrastructure and reptile ponds and must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow; and

4.1.1.3 The velocity of storm water discharges must be attenuated and the banks of the watercourses protected;

4.2 Structures and Materials

4.2.1 Necessary erosion prevention measures must be employed to ensure the sustainability of all structures.

4.2.2 The height, width and length of structures must be limited to the minimum dimension necessary to accomplish the intended function.

4.2.3 Structures must not be damaged by floods exceeding the magnitude of floods occurring on average once in every 100 years.

4.2.4 Structures must be non-erosive, structurally stable and must not induce any flooding or safety hazard.

4.2.5 Structures must be inspected regularly for accumulation of debris, blockage, erosion of abutments and overflow areas - debris must be removed and damages must be repaired and reinforced immediately.

4.2.6 Any access roads, bridges, pathways or other linear crossings should be:

4.2.6.1 Non-erosive, structurally stable and should not induce any flooding or safety hazard;

4.2.6.2 Any damage is repaired immediately to prevent further damage;

4.2.6.3 Non-polluting with respect to silt and litter that can be deposited into a watercourse;

4.2.6.4 Watercourse crossings to facilitate the movement of aquatic and non-aquatic organisms and fauna;

4.2.6.5 Crossing surfaces must be tarred, paved or concreted along the extent of the watercourse and extent at least 100m beyond the extent of the watercourse to minimise impacts on the characteristics of the watercourse;

- 4.2.6.6 Where any road is within the 100m buffer zone of the watercourse, this portion of the road shall be concreted, paved or tarred; and
4.2.6.7 Not consist of any polluting material.

4.2.7 Landscape maintenance plan must be submitted for approval by Provincial Head within 6 months of licence being issued.

4.3 Water Quality

4.3.1 The Licensee shall sample the water quality monthly for the mentioned variables (Table 2) at least at the monitoring points both upstream and downstream of the activities (Table 2). The General effluent standards listed in Government gazette 18 may 1984 no 9225 (Regulation no. 991 18 may 1984)must be used to analyse water quality results and report to the Provincial Head within thirty (30) days after the results of each sampling event is received:

Table 2: Water quality parameters relevant for sampling.

Variable
Flow (ℓ/s)
Temperature (°C)
pH
Electrical conductivity (EC) (mS/m)
Suspended solids (SS) (mg/ℓ)
Dissolved oxygen (mg/ℓ)
Turbidity (NTU)
Alkalinity (mg CaCO ₃ /ℓ)
PO ₄ (mg/ℓ)
NO ₃ /NO ₂ (as N) (mg/ℓ)
NH ₃ (as N) (mg/ℓ)
BTEX, TPH (mg/ℓ)
Faecal coliforms (counts/100mℓ)

- 4.3.2 Monitoring must continue for three (3) years after the issuance of this licence for the activities listed in condition 1.1
- 4.3.3 Monitoring must be undertaken as set out in section 5.
- 4.3.4 Activities that lead to elevated levels of turbidity of any watercourse(s) must be prevented, reduced, or otherwise remediated. Activities must be scheduled to take place during the dry seasons when flows are lowest where reasonably possible. If this is not possible and if management measures have not been provided for in the reports submitted to the Provincial Head, the Licensee must submit such to the Provincial Head for a written approval before these activities commence. Natural in stream hydrology is to be used to determine which months constitute the low flow months.
- 4.3.5 The Licensee must ensure that the quality of the water to downstream water users does not decrease because of the of the water use activities listed under condition 1.1.
- 4.3.6 Pollution of and disposal/spillage of any material into the watercourse must be prevented, reduced, or otherwise remediated through proper operation, maintenance and effective protective measures.



- 4.3.7 Vehicles and other machinery must be serviced well above the 1:100 year flood line or delineated riparian habitat, whichever is the greatest. Oils and other potential pollutants must be disposed off at an appropriate licensed site, with the necessary agreement from the owner of such a site.
- 4.3.8 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance and all storage facilities must be equipped with large, clearly readable Material Safety Data Sheets (MSDS).
- 4.3.9 All reagent storage tanks and reaction units must be supplied with a bunded area built to cater for at least 110% of the capacity of the facility and provided with sumps and pumps to return the spilled material back into the system. The system must be maintained in a state of good repair and standby pumps must be provided.
- 4.3.10 The Licensee shall actively participate in any Catchment Management Agency's related activity.
- 4.3.11 The Licensee has to indicate to the Responsible Authority within sixty (60) days after issuance of this licence, the strategic placement of bio-swale, bio-filters, silt, litter and hydrocarbon (oil) traps to minimise the risk of pollutants entering the natural drainage system of the area.

4.4 Flow

- 4.4.1 The Licensee must determine flood lines (1:50 and 1:100 year) to ensure risks are adequately managed. Flood lines must be clearly indicated on the site plan(s) and drawings along with all wetland boundaries.
- 4.4.2 The activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics. The Licensee must ensure that the overall magnitude and frequency of flow in the watercourse(s) does not decrease, other than for natural evaporative losses and authorised attenuation volumes.
- 4.4.3 Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.
- 4.4.4 Structures must be designed in a way to prevent the damming of stream/river water and not impact on the flow of the water, during the construction and operational phases of all developments.
- 4.4.5 The development may not impede natural drainage lines.
- 4.4.6 The diversion structures may not restrict river flows by reducing the overall river width or obstructing river flow.
- 4.4.7 The characteristics of streambed are likely to be altered locally. In particular the rock and rubble created during the construction process is likely to have sharp edges, and not smooth surfaces that are typically associated with river rocks and pebbles. All rock and rubble must be removed from the watercourse once construction has been completed. Any rock placed in the watercourse to enhance the dissolved oxygen content of the water must



adhere to the same criteria, namely only smooth rock surfaces to be placed within the watercourse.

- 4.4.8 The Licensee shall determine flow requirements for endemic aquatic organisms and the associated habitat (riparian and in-stream) by a registered, professional, independent and qualified aquatic ecologist and hydrologist within one (1) year after the issuance of this licence and submit the report to the Provincial Head for a written approval. Reporting on the flow requirements as per condition 3.3.1 of this Appendix.

4.5 Riparian and Instream Habitat (Vegetation and Morphology)

- 4.5.1 Activities (including spill clean-up) must start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream works.
- 4.5.2 Operation and storage of equipment must not take place within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest unless authorised in this license.
- 4.5.3 Activities must not occur in sensitive riffle habitats.
- 4.5.4 Indigenous riparian vegetation, including dead trees, outside the limits of disturbance indicated in the site plans must not be removed from the area.
- 4.5.5 Alien and invader vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be sustainably eradicated or controlled according to a respective management plan as formally approved by the Provincial Head in writing within one (1) month after the issuance date of this licence.
- 4.5.6 Existing vegetation composition must be maintained or improved by maintaining the natural variability in flow fluctuations. Rehabilitated areas shall have vegetation basal cover of at least 15% at all times.
- 4.5.7 Recruitment and maintaining of a range of size classes of dominant riparian species in perennial channels must be stimulated.
- 4.5.8 Encroachment of additional exotic species and terrestrial species in riparian zones must be discouraged.
- 4.5.9 Accumulation of woody debris on terraces by periodic flooding must be discouraged.
- 4.5.10 Existing flood terraces and deposition of sediments on these terraces to ensure optimum growth, spread and recruitment of these species must be maintained.
- 4.5.11 All reasonable steps must be taken to minimise noise and mechanical vibrations in the vicinity of the watercourse. Noise levels (noise resulting from the activities listed in Table 1 and associated activities) to be below 35dB from 18:00 – 06:00 daily.
- 4.5.12 Necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent instream sedimentation.
- 4.5.13 Soils that have become compacted through the water use activities must be loosened to an appropriate depth to allow seed germination.



- 4.5.14 Slope/bank stabilisation measures must be implemented with a 1:3 ratio or flatter and vegetated with indigenous vegetation immediately after the shaping.
- 4.5.15 Stockpiling of removed soil and sand must be stored outside of the 1:100 flood line or delineated riparian habitat, whichever is the greatest, to prevent being washed into the river and must be covered to prevent wind and rain erosion.
- 4.5.16 The indiscriminate use of machinery within the instream and riparian habitat will lead to compaction of soils and vegetation and must therefore be strictly controlled.
- 4.5.17 The overall macro-channel structures and mosaic of cobbles and gravels must be maintained by ensuring a balance (equilibrium) between sediment deposition and sediment conveyance maintained. A natural flooding and sedimentation regime must thus be ensured as far as reasonably possible.
- 4.5.18 As much indigenous vegetation growth as possible should be promoted within the proposed development area in order to protect soil and to reduce the percentage of the surface area which is paved/hardened/compacted.
- 4.5.19 Run-off from paved/hardened/compacted surfaces should be slowed down by the strategic placement of berms.
- 4.5.20 The Licensee shall protect the banks of the watercourse against instability and erosion and ensure a healthy and sufficient bank side vegetation cover. A specific management program addressing this concern shall be developed by a professional, qualified, independent and registered ecologist and aquatic specialist and submitted to the Provincial Head for written approval within three (3) months after the issuance of this licence.
- 4.5.21 Plant Species Plan must be drawn up in conjunction with a landscape architect or botanist and approved by Provincial Head and implemented within 6 months of licence being issued.

4.6 **Biota**

- 4.6.1 The Licensee must take all reasonable steps to allow movement of aquatic species, including migratory species. The Licensee shall appoint a professional, qualified, independent and registered ecologist and aquatic specialist to determine the impact of the weirs on aquatic biota migration and submit a report for written approval to the Provincial Head within six (6) months after the issuance of the licence. The Licensee shall implement the recommendations endorsed by the Provincial Head. Reporting on biota component must be captured separately in the reporting requirement of condition 5.1 of Appendix IV. The report must also assess the reintroduction of endemic aquatic species in this environment (note condition 5.1 REC value).
- 4.6.2 All reasonable steps must be taken not to disturb the breeding, nesting and/or feeding habitats and natural movement patterns of aquatic biota.
- 4.6.3 The current level of diversity of biotopes and communities of animals, plants and microorganisms must be maintained.



5. REHABILITATION AND MANAGEMENT

- 5.1 The Licensee must embark on a systematic long-term rehabilitation programme to restore the watercourse to environmentally acceptable and sustainable conditions, which must include, but not be limited to the rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem.
- 5.2 All disturbed areas must be re-vegetated with an indigenous seed mix in consultation with an indigenous plant expert, ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.
- 5.3 An active campaign for controlling invasive species must be implemented within disturbed zones to ensure that it does not become a conduit for the propagation and spread of invasive exotic plants.
- 5.4 Rehabilitation must be concurrent with construction.
- 5.5 Topsoil must be stripped and redistributed.
- 5.6 Compacted and disturbed areas must be shaped to natural forms and to follow the original contour. In general cut and fill slopes and other disturbed areas must not exceed 1:3 (v:h) ratio, it must be protected, vegetated, ripped and scarified parallel with the contour.
- 5.7 The Provincial Head must sign a release form indicating that rehabilitation was done satisfactory according to specifications as per this license.
- 5.8 A photographic record must be kept as follows and submitted with reports as set out in section 5:
 - 5.8.1 Dated photographs of all the sites to be impacted before construction commences;
 - 5.8.2 Dated photographs of all the sites during construction on a monthly basis; and
 - 5.8.3 Dated photographs of all the sites after completion of construction, seasonally.
- 5.9 Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages instabilities and erosion with concomitant remedial and maintenance actions.
- 5.10 Rehabilitation Plan must be updated and drawn on a drawing for approval by provincial Head within 6 months of licence being issued.
- 5.11 Experienced environmental rehabilitation personnel as well as the correct equipment for environmental rehabilitation must be available.

6. MONITORING AND REPORTING

- 6.1 A comprehensive and appropriate environmental assessment and monitoring programme (including bio-monitoring and eco-toxicology) to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities listed under condition 1.1 and other existing activities as well as compliance to these water use licence conditions must be developed and submitted to the Provincial Head for a written approval before commencement and must subsequently be implemented



- 6.2 Six (6) monthly monitoring reports for Groundwater and surface water must be submitted to the Provincial Head until otherwise agreed in writing with the Provincial Head.
- 6.3 A qualified and responsible scientist must be retained by the Licensee who must give effect to the various licence conditions and to ensure compliance thereof pertaining to all activities impeding and/or diverting flow of watercourses as well as alterations to watercourses on the property as set out in condition 1.1.
- 6.4 The Licensee shall conduct an internal and external audit as per condition 11 and 12 of Appendix 1 and the audit report must include:
- 6.4.1 Reporting in respect of the monitoring programme referred to in condition 5.1 of Appendix IV and all other reporting and compliance conditions outlined in this licence;
 - 6.4.2 A record of implementation of all mitigation measures including a record of corrective actions; and
 - 6.4.3 Compensation measures for damage where mitigation measures have failed to adequately protect the in-stream and riparian habitat or any other characteristic of the watercourses.
- 6.5 The Licensee must apply in writing to the Provincial Head for alternative reporting arrangements for which written approval must be provided.
- 6.6 A comprehensive ground water and surface water monitoring and remediation plan must be provided within 6 months of licence being issued. Such plan must detail how the possible pollution effects from the dirty water impoundment facilities that do not have a barriers system that complies with the requirements of the current Regulations will be remediated and how future pollution from the same facilities will be prevented, in accordance with the requirements of section 19 of the National Water Act (1998).

7. OTHER WATER USERS

- 7.1 The Licensee must attempt to prevent adverse affect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee must initiate suitable compensative measures.

8. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

- 8.1 If surface and/or groundwater pollution has occurred or may possibly occur, the Licensee must conduct, and/or appoint specialists to conduct necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Provincial Head.
- 8.2 The Licensee shall keep all records relating to the compliance or non-compliance with the conditions of this licence in good order. Such records shall be made available to the Provincial Head within 14 (fourteen) days of receipt of a written request by the Department for such records.
- 8.3 The Licensee shall keep an incident report and complaints register, which must be made available to any external auditors and the Department.



9. BUDGETARY PROVISIONS

- 9.1 The water user must ensure that there is a budget sufficient to complete and maintain the water use and for successful implementation of the rehabilitation programme as set out in this licence.
- 9.2 The Department may at any stage of the process request proof of budgetary provisions for rehabilitation and closure of project.



APPENDIX III

Section 21(f) of the Act: Discharging waste or water containing waste into a water resource

1. QUANTITY OF WASTEWATER TO BE DISCHARGED

- 1.1 This licence authorises the discharge of a maximum quantity of 3650 m³/a (Three Thousand Six Hundred and Fifty cubic metres per annum) of treated effluent from groundwater.
- 1.2 The quantity of treated wastewater authorised to be discharged in terms of this licence must not be exceeded.
- 1.3 A dewatering baseline water quality need to submitted prior commencement of the proposed activity.

2. QUALITY OF WATER CONTAINING WASTE DISCHARGED

- 2.1 The quality of the wastewater discharged into the Liesbeeck River may not exceed the limits the General effluent standards listed in Government gazette 18 may 1984 no 9225 (Regulation No. 991 18 may 1984). The limits must be used to analyse water quality results and report as set out in Table 1.

Table 1: Quality of wastewater to be discharged

Variable
pH
Electrical Conductivity in mS/m
Nitrate (as N) in mg/l
Ammonia (as N) in mg/l
Chemical oxygen demand(COD) in mg/l
Orthophosphate (as P) in mg/l
Suspended solids in mg/l
Total dissolved solids
E.coli per 100ml

3. MONITORING

3.1. Quantity

- 3.1.1. The quantity of the dewatered wastewater discharged into the Liesbeeck River shall be metered and recorded daily during construction.
- 3.1.2. Flow metering, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person as per design specification. Calibration certificates shall be available for inspection by the Provincial Head or his / her representative upon request.

3.2 Quality



- 3.2.1 Water quality monitoring points must be at the outlet of the stormwater channel, upstream and downstream of the discharge point in the Liesbeeck River.
- 3.2.2 The monitoring points must be identified in consultation with and approved by the Provincial Head or his representative.
- 3.2.3 The date, time and monitoring point in respect of each sample taken must be recorded together with the results of the analyses.
- 3.2.4 The samples taken at the outlet and at the Liesbeeck upstream and downstream on monthly basis.

Table 2: Variables and monitoring frequency for outlet and points upstream and downstream of works

Variable	Frequency
pH	Monthly
Electrical Conductivity (EC) (mS/m)	Monthly
Chemical Oxygen Demand (COD) (mg/l)	Monthly
Suspended Solids	Monthly
Ammonia (ionised and un-ionised) as Nitrogen (NH ₃ as N) (mg/l)	Monthly
Nitrate/Nitrite as Nitrogen (NO ₃ /NO ₂ as N) (mg/l)	Monthly
Ortho-Phosphate as Phosphorous (PO ₄ as P) (mg/l)	Monthly
Typical (faecal) coli	Monthly

3.4 Bio-monitoring

- 3.4.1. The Licensee must develop and submit to the Provincial Head within six (6) months of issuance of the licence a bio-monitoring programme that will include the compilation of an initial database from which the scope and frequency of future bio-monitoring can be developed. This initial assessment must lead to the establishment of a reliable site-specific long-term bio-monitoring programme. This programme must be able to qualify and quantify the impact on biological systems in the water environment in the area directly affected by the waste water treatment works activities as well as downstream from these activities.
- 3.4.2 A competent and capable aquatic scientist must be appointed by the Licensee to submit a monitoring programme for aquatic macro-invertebrates and habitat integrity. Aquatic macro-invertebrates must be sampled using the latest SASS (South African Scoring System) method. Habitat Integrity must be assessed using the Rapid Bio-assessment Analysis (C.J. Kleynhans 1999) method described by the Department (SASS 2002).
- 3.4.3 After any incident, SASS surveys must be conducted annually in autumn, spring and summer at a site upstream and downstream of the disturbance until the impacts of the incident are not noticeable anymore. An annual report on the SASS surveys must be submitted to the Provincial Head.



4. METHODS OF SAMPLING AND ANALYSIS

- 4.1 Sampling and analysis shall, wherever applicable, be carried out in accordance with methods prescribed by, and obtainable from, the South African Bureau of Standards (SABS), in terms of the Standards Act, 1982 (Act 30 of 1982), or any other method approved in writing by the Provincial Head.
- 4.2 The methods of analysis shall not be changed without prior notification to, and written approval by the Provincial Head.
- 4.3 Sample analysis must be conducted by a recognized analytical laboratory, accredited to analyze the relevant constituents in the wastewater, or approved by the Provincial Head to perform the analyses.

5. STORM WATER MANAGEMENT

- 5.1 Storm water leaving the Licensee's premises must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas of a combination thereof which is produced, used, stored dumped or spilled on the premises.
- 5.2 Increased runoff due to vegetation clearance and soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the streams.
- 5.3 The Licensee must ensure that no stormwater will ingress into the wastewater system and that no wastewater ingress into the stormwater system.
- 5.4 Wastewater impoundments must be designed, constructed and managed to ensure that there is sufficient capacity to contain the 1:50 year flood event, with a minimum of 0.8 m freeboard. Freeboard will be defined as the difference between the water level and the crest of the overflow.
- 5.5 Stormwater must be diverted from the impoundments and roads, and must be managed in such a manner as to disperse runoff and to prevent the concentration of the stormwater flow.
- 5.6 Cut-off drains must be provided around the WWTWs to prevent storm-water ingress into the surrounding of the works. These drains must be designed to contain the maximum runoff, which could be expected over a period of 24 hours with a frequency of once in every 20 years.
- 5.7 The Licensee must conduct gulley inspections upstream to ensure that stormwater does not ingress into the wastewater system.

6. PIPELINES

- 6.1 The pipelines used for the conveyance of waste or water containing waste shall be painted in a conspicuous colour or manufactured of a coloured material distinctly different from the colour of the pipelines in which drinking water is flowing to avoid the possibility of any cross-connections of the different pipelines.
- 6.2 All stop-valves and taps on the pipelines conveying the waste or water containing waste shall be of a type that can be opened and closed by means of a loose wrench. This wrench



shall be in the safekeeping of a responsible member of the staff to prevent unauthorised use thereof.

- 6.3 Notices manufactured of a durable weatherproof material warning against the use of water containing waste for drinking and washing purposes shall be displayed at prominent places where the water containing waste is being reused and at all taps. Such notices shall be worded in the official languages applicable in the area.
- 6.4 The Licensee must inspect the pipelines conveying the water containing waste and the pumping facilities on a weekly basis to check for leaks or malfunctions and records shall be kept of such inspections.
- 6.5 The Licensee shall have the full length of the pipeline surveyed on an annual basis to monitor the integrity of the pipeline. The results of the survey shall be reported in writing to the Provincial Head.

7. PUMP STATIONS

- 7.1 The Licensee shall develop and implement a scheduled monitoring and maintenance plan for all wastewater pump stations and manholes under its control.
- 7.2 All pump stations shall have an emergency containment facility with sufficient capacity to ensure untreated effluent retention up to a 24-hour period.

8. MANHOLES

- 8.1 The Licensee must ensure that:
 - 8.1.1 Manholes are covered at all times with a suitable cover that cannot be removed by unauthorised persons;
 - 8.1.2 Manhole covers of a material that is less prone to theft are used.
 - 8.1.3 No new WWTWs lines and manholes are constructed in the 1:100 year flood line and
 - 8.1.4 Existing WWTWs lines and manholes situated within the 1:100 year flood lines are sealed adequately to ensure minimal ingress of water during any rainfall event.

9. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

- 9.1 Pollution caused by spills either accidental or from mechanical or electrical breakdown or power disruptions must be prevented through proper maintenance and effective protective measures.
- 9.2. All reagent and chemical storage areas must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps to contain the spilled material. The system shall be maintained in a state of good repair and standby pumps must be provided.
- 9.3. Any hazardous substances must be handled according to the relevant legislation relating to the transport, storage and use of the substance.
- 9.4 Pollution incidents shall be dealt with in accordance with the Act.



- 9.5 The Licensee must, within fourteen (14) days, or a shorter period of time, as specified by the Provincial Head, from the occurrence or detection of any incident referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Provincial Head of measures taken to:
- 9.5.1 correct the impacts resulting from the incident;
 - 9.5.2 prevent the incident from causing any further impacts; and
 - 9.5.3 prevent a recurrence of a similar incident.
- 9.6 The Licensee shall keep all records relating to the compliance or non-compliance with the conditions of this licence in good order. Such records shall be made available to the Provincial Head within fourteen (14) days of receipt of a written request by the Provincial Head for such records.
- 9.7 The Licensee shall keep an incident report and complaints register, which must be made available to any external auditors and the Provincial Head.

10. CONTINGENCY PLANS AND INCIDENT REPORTING

- 10.1 The Licensee must develop and implement an emergency and contingency plan.
- 10.2 The Licensee must implement and promote an environmental call and reporting system where the following can be reported:
- 10.2.1 Illegal disposal of waste and/or littering;
 - 10.2.2 Broken, ruptured or leaking pipelines wasting potable water;
 - 10.2.3 open or leaking taps on the property of the Licensee;
 - 10.2.4 Open manholes;
 - 10.2.5 Leaking or broken sewerage lines and pipes;
 - 10.2.6 Overflowing manholes and pump stations;
 - 10.2.7 Possible offenders of any environmental regulations, by-laws and/or ordinances;
and
 - 10.2.8 Any other aspect that might hamper the effective management of the water resources.
- 10.3 The Licensee must compile an environmental call and reporting centre protocol, that must be included in the Plan, and which will investigate every complaint within twenty four (24) hours of it being reported.
- 10.4 The Licensee must rectify all valid issues reported within seven (7) days of the issue being reported to the Licensee. All incidents shall be recorded in an incident register which will include reasons for non-rectification of issues raised
- 10.5 A summary of malfunctions and incidents shall be included in the annual external audit report.

11. REPORTING

- 11.1 The information required in terms of condition 3 of appendix II must be submitted monthly to the Provincial Head under Reference number 27/2/2/G322/42/3 (WU8044).



11.2 Information and data must also be submitted in a digital format as required by the Provincial Head in the prescribed format to be included in the regional database.



APPENDIX IV

Section 21(j) of the Act: Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

1. The Licensee is authorised to remove a total volume of Three Thousand Six Hundred and Fifty cubic metres per annum (3 650 m³/a) of underground water from underground Erf 212, Bishopscourt and dispose of the underground water in storm water on Table 1.

Table 1: Removing water found underground for the continuation of an activity

Purpose/Description	Purpose	Volume (m ³ /a)	Property	Co-ordinates
S21(J) water use activities				
Removal of water found underground for the construction of protea village residential development	Removing excess water on site during construction of houses	3650	ERF 212, BISHOPSCO URT	33° 59' 14.4" S 18° 26' 23.5" E

2. The quantity of water authorised to be removed and disposed in terms of this licence may not be exceeded without prior authorisation by the Minister.
3. No water must be dewatered after construction of residential area.
4. The Licensee must provide any water user whose water supply is impacted by the water use with potable water.
5. The quantity of water removed from underground must be metered and recorded on a daily basis.
6. The groundwater levels must be monitored monthly.
7. Self-registering flow meters must be installed in the delivery lines at easily accessible positions near the dewatering points.
8. The flow metering devices must be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates must be available for inspection by the Provincial Head or his/her representative upon request.
9. Calibration certificates in respect of the pumps must be submitted to the Provincial Head after installation thereof and thereafter at intervals of two years.
10. The date and time of monitoring in respect of each sample taken must be recorded together



with the results of the analysis.

11. Analysis must be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards, in terms of the Standards Act, 1982 (Act 30 of 1982).
12. The methods of analysis must not be changed without prior notification to the Licensee and written approval by the Minister or his/her delegated nominee.
13. The Provincial Head must be informed of any incident that may lead to under-groundwater being disposed of contrary to the provisions of this licence, by submitting a report containing the following information:
 - 13.1 Nature of the incident (e.g. operating malfunctions, mechanical failures, environmental factors, loss of supply services, etc);
 - 13.2 Actions taken to rectify the situation and to prevent pollution or any other damage to the environment; and
 - 13.3 Measures to be taken to prevent re-occurrence of any similar incident.
14. The Licensee must follow acceptable construction, maintenance and operational practices to ensure the consistent, effective and safe performance of the underground water removal system.
15. Reasonable measures must be taken to provide for mechanical, electrical or operational failures and malfunctions of the underground water removal system.

END OF LICENCE

