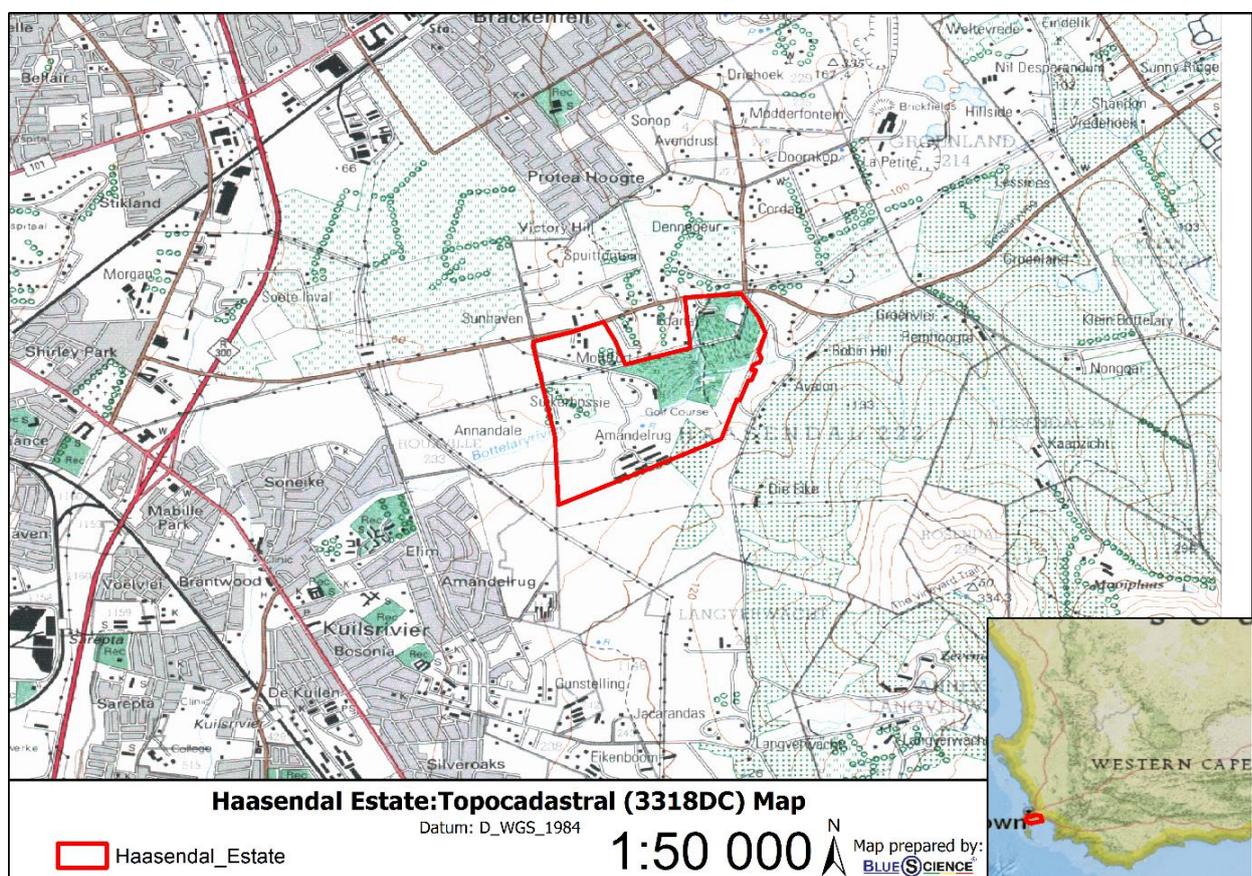


*Addendum to*  
**Freshwater Assessment Report for the Haasendal Estate (Portion 1, 11, 26,  
30, 34, 58 and 87 of Farm 222), KuilsRivier**

*September 2018*

## 1. INTRODUCTION AND BACKGROUND

The Haasendal Estate comprises of a proposed mixed residential and commercial development on portions 01, 11, 26, 30, 34, 58 and 87 of farm Haasendal no 222 on the north-eastern outskirts of Kuilsrivier, a suburb in the City of Cape Town. The suburb of Brackenfell lies to the north of the site. The Bottelary Hills lie to the east and south east of the site.



**Figure 1. Topographical map of the study site and the surrounding area**

A freshwater assessment of the site was conducted for the development in February 2008 (Belcher, 2008). A non-substantive amendment to the original authorised activities has been applied for from the Department of Environmental Affairs and Development Planning. A follow-on freshwater report that provided an update of that original assessment, taking the current proposed development plan and the latest freshwater information into account was completed in May 2017. This addendum

report is intended to provide the risk assessment for the associated water use activities for the project. These include:

- 21 (c) and (i) for the rehabilitation of buffer areas within the floodlines;
- 21 (c) and (i) for the establishment of sports fields within the floodlines;
- 21 (c) and (i) for the construction of foot and vehicle bridges crossing streams;
- 21 (c) and (i) for the construction of stormwater outlet structures.

## **2. SUMMARY OF FINDINGS AND RECOMMENDATIONS FROM FRESHWATER ASSESSMENT REPORT**

The findings and recommendations of the freshwater assessment for the project as summarised as follows:

*“The Bottelary River flows across the site proposed for the Haasendal Estate Development from east to west. There are five unnamed tributaries which confluence with the Bottelary River on the site. A few wetland areas are also wetland areas associated with the Bottelary River and its tributaries.*

*The features on the site have been modified by upstream activities such as treated wastewater and stormwater discharges, canalization and piping. On the site, surrounding land use has resulted in much of the indigenous riparian vegetation being removed from the river and streams. The riparian zones have been invaded by *P. clandestinum* and *A. saligna*. The instream habitat of the Bottelary River is considered to be moderately modified while the riparian habitat is largely to seriously modified. The instream habitat of the tributaries is considered to be moderately to largely modified and the riparian habitat is considered to be seriously modified. The wetlands on the site are considered largely modified.*

*In terms of the importance and sensitivity of the features, the numerous impacts have greatly reduced their species richness and diversity. The Bottelary River is of moderate ecological importance and sensitivity and its tributaries on the site are considered to be of moderate to low ecological sensitivity and importance. The wetlands offer certain ecosystem services to a moderate extent and are considered to be of moderate ecological importance and sensitivity.*

*In order to maintain what remains of the ecological functioning of the systems on the site it is recommended that a buffer be instated around the Bottelary River and its tributaries. It is recommended that a 30m buffer from river centre be instated around the Bottelary River. Where wetland areas fall outside of this buffer zone, it is recommended that the buffer be extended to ensure the wetlands are protected. A buffer zone of 10-15m from stream centre is also recommended for the larger unnamed tributaries.*

*The proposed stormwater management plan has taken into consideration the proposed freshwater constraints and is supported from an aquatic ecosystem point of view as the potential impacts of stormwater runoff from the developed areas will be adequately mitigated and are likely to have a very limited impact on the Bottelary River.”*

### 3. Risk Assessment

According to the preamble to Part 6 of the NWA, “This Part established a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette...” “The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary...”

The General Authorisations for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA have recently been revised (Government Notice R509 of 2016). The proposed works within or adjacent to the aquatic features have the potential to change the characteristics of the associated freshwater ecosystems and may therefore require authorization. Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse.

A risk assessment was carried out for the proposed activity (summary in Table 1). The full risk assessment matrix can be seen in full in Appendix A. The risk rating, (where Low (L) risk has a significance score of 1-55 and Moderate risk (M) has a score of 56-169) of the proposed activities is considered to be low provided the recommended mitigation measures are implemented.

**Table 1: A summary of the risk assessment for the proposed activity**

Phases	Activity	Aspect	Impact	Significance	Risk Rating
Construction	Demarcation of buffer areas and preparation of site with installation of services	Potential for contaminated runoff from site preparation and construction works	Disturbance and potential modification of aquatic habitat with the potential for water quality and flow impacts on aquatic features	46.125	L
	Construction activities for the proposed development outside of the recommended buffer zones			52.875	L
	Establishment of sports areas within floodlines			32.625	L
	Rehabilitation of buffer areas within the 1 in 100 year floodlines	Disturbance of soil and vegetation adjacent to aquatic features		48.375	L
	Construction of foot and vehicle bridges over watercourses as indicated in the SDP for the development	Laying of culvert/crossing structures within watercourses with habitat clearing, shaping and rehabilitation/revegetation		48.125	L
	Construction of stormwater infrastructure within floodlines	Construction of stormwater outlet structures within watercourse buffer areas		53.625	L
Operation	Maintenance and management of infrastructure in or adjacent to aquatic ecosystems	Clearing of reeds within the aquatic features	Disturbance of aquatic habitat with possible water quality impacts - associated with maintenance activities in accordance with the approved MMP	55.125	L
		Removal of sediment from structures within aquatic features to ensure proper functioning of the structures		36.25	L
		Maintenance of vegetation		35.75	L

		(alien invasive and nuisance indigenous plants) in buffers			
		Minor repairs to approved infrastructure within aquatic features		38.0625	L
	Stormwater runoff and discharges into aquatic features	Direct and indirect stormwater discharge into wetlands and watercourses	Flow and water quality impacts associated with stormwater discharge	54.625	L

The above-mentioned activities, although being located within the floodlines, have allowed for the recommended buffers indicated in the freshwater assessment report for the project. These buffers will be rehabilitated. One can thus expect that the activities will pose a low risk of degrading the watercourse. It is therefore recommended that these water use activities be authorised in terms of the General Authorisations for Section 21(c) and (i) water uses.

Recommended mitigation measures for the activities assessed in the above risk matrix:

- A 30m buffer (measured from river centre) must be instated along the Bottelary River. Where wetland areas fall outside of this buffer zone, it is recommended that the buffer be extended to ensure the wetlands are protected. A buffer zone of 10-15m from stream centre is also recommended for the unnamed tributaries while the larger south-eastern tributary should remain within a 20 -30m wide ecological corridor. The 30 m buffer will be implemented prior to the commencement of any activity and where there are associated wetlands present, the buffer will be extended to ensure these wetlands are included within the buffer zone, which will be subjected to rehabilitation, maintenance and management activities. No infilling of hard structures should be placed within the buffer zones. These areas should be cleared of invasive alien plants and indigenous vegetation should be utilised to revegetation disturbed areas. A rehabilitation and planting plan should be compiled to inform the works required to establish the riparian zones and buffer areas.
- Good housekeeping measures should be implemented for the construction works on site as per an approved Environmental Management and monitored by an appointed Environmental Control Officer.
- Works within the watercourse should take place during the low flow period (Nov/Dec to Apr/May). Disturbance of the watercourse should be limited as far as possible (time and extent of works). Access to the works should be limited to the established access routes. The channel where the works has been undertaken should be rehabilitated immediately after the works is completed and revegetated to limit the erosion and sediment impacts. The structures should not impede or divert flow in the watercourses.
- Alien vegetation must be removed from within the aquatic features and their buffer zones, with a focus on *A. saligna* and *P. clandestinum*. Rehabilitation of the buffer zones with appropriate riparian indigenous vegetation is recommended. Recommended indigenous vegetation includes *Olea europaea* subsp. *africana*, *Salix macronata*, *Searsia augustifolia*, *Cliffortia odorata*, *Pennisetum macrourum*, *Isolepis prolifer*, *Cyperus textilis*, *Juncus effuses*, *Bolboschoenus maritimus*, *Carex clavata*, *Zantedeschia aethiopica*, *Chasmanthe aethiopica* and *Cynodon dactylon*. The development of infrastructure with hard foundations within these zones should be avoided and they should also not be used to dump rubble, soil or material of any kind except for those activities directly associated with the golf course

development. No compacted golf course holes will be allowed within the identified buffer zones but greens associated with the golf course can extend into the buffers provided they are not planted with invasive kikuyu grass or a management edge is provided between the green area and the watercourse riparian zone. Such a management edge could comprise of a gravel/woodchip walkway. School fields can be inside the 1:100 year floodline but must remain outside of the buffer zones

- An Maintenance Management Plan must be drawn up for the entire estate to rehab, maintain and manage watercourses from the estate with input from the engineer and freshwater specialist and implemented by the home-owners association for the estate. The MMP must ensure that the watercourses must remain as an ecological corridor and much be managed as such. The instream dams must be landscaped to ensure habitat and biota diversity.
- The Recommended Ecological Category for the valley bottom wetland must be maintained and managed in a C category. Grey water systems must be incorporated into the proposed development. The stormwater management system should be monitored and managed to ensure that it continues to function effectively as it is designed to work. Monitoring of the alien vegetation, debris that can block the infrastructure and any signs of erosion within the watercourses should be undertaken at least 6 monthly and dealt with as per the MMP.

#### 4. Summary and Conclusions

The risks of the proposed rehabilitation of the watercourse buffers; construction of the watercourse crossings, as well as establishment of sports fields and construction of stormwater outlets within the 1 in 100 year floodlines degrading the ecological condition of the Botterlary River and its associated aquatic features within the site is likely to be low. It is thus recommended that these water use activities be authorised in terms of the General Authorisations for Section 21(c) and (i) water uses.

#### Prepared By:

Toni Belcher (SACNASP no. 400040/10)



PO Box 455, Somerset Mall, 7137

Tel: (021)851 0555

Cell: 082 883 8055

Email: [toni@bluescience.co.za](mailto:toni@bluescience.co.za)

# Appendix A. Risk Matrix for Haasendal Estate

ASPECTS AND IMPACT REGISTER/RISK ASSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS, DRAINAGE LINES  
 COMPILED BY: Toni Belcher (SACNASP no. 400040/10), BlueScience

PROJECT: HAASENDAL ESTATE (PORTION 1, 11, 26, 30, 34, 58 AND 87 OF FARM 222), KUILSRIVIER

Nr.	Phases	Activity	Aspect	Impact	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	Confidence	Type Watercourse; PES and EIS
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Vegetation)	Biota	Severity													
1	Construction	Demarcation of buffer areas and preparation of site with installation of services	Potential for contaminated runoff from site preparation and construction works	Disturbance and potential modification of aquatic habitat with the potential for water quality and flow impacts on aquatic features	1	1.5	1	1	1.125	2	2	5.125	1	1	5	2	9	46.125	L	A 30m buffer (measured from river centre) must be instated along the Bottelary River. Where wetland areas fall outside of this buffer zone, it is recommended that the buffer be extended to ensure the wetlands are protected. A buffer zone of 10-15m from stream centre is also recommended for the unnamed tributaries while the larger south-eastern tributary should remain within a 20-30m wide ecological corridor. The 30m buffer will be implemented prior to the commencement of any activity and where there are associated wetlands present, the buffer will be extended to ensure these wetlands are included within the buffer zone, which will be subjected to rehabilitation, maintenance and management activities. No infilling of hard structures should be placed within the buffer zones. These areas should be cleared of invasive alien plants and indigenous vegetation should be utilised to revegetate disturbed areas. A rehabilitation and planting plan should be compiled to inform the works required to establish the riparian zones and buffer areas. Good housekeeping measures should be implemented for the construction works on site as per an approved Environmental Management and monitored by an appointed Environmental Control Officer.	High	Watercourses and wetlands associated with the Bottelary River in GZE catchment; Bottelary PES-C&D/E and EIS-Moderate; Bottelary tributary PES-C/D&E; EIS-Low
2	Construction activities for the proposed development outside of the recommended buffer zones	1.5			2	1	1	1.375	2	2.5	5.875	1	1	5	2	9	52.875	L				
3	Establishment of sports areas within floodlines	1			1.5	1	1	1.125	1	1.5	3.625	1	1	5	2	9	32.625	L				
4	Rehabilitation of buffer areas within the 1 in 100 year floodlines	1	1.5	1.5	1.5	1.375	2	2	5.375	1	1	5	2	9	48.375	L						
5	Construction of foot and vehicle bridges over watercourses as indicated in the SDP for the development	Laying of culvert/crossing structures within watercourses with habitat clearing, shaping and rehabilitation/revegetation	2	2	2	1.5	1.5	1.875	1	1.5	4.375	1	3	5	2	11	48.125	L	Works within the watercourse should take place during the low flow period (Nov/Dec to Apr/May). Disturbance of the watercourse should be limited as far as possible (time and extent of works). Access to the works should be limited to the established access routes. The channel where the works has been undertaken should be rehabilitated immediately after the works is completed and revegetated to limit the erosion and sediment impacts. The structures should not impede or divert flow in the watercourses.			
6	Construction of stormwater infrastructure within floodlines	Construction of stormwater outlet structures within watercourse buffer areas	2	2	2	1.5	1.875	1	2	4.875	1	3	5	2	11	53.625	L	Any surface water runoff associated with the site must be accommodated within the approved stormwater management plan for the site. Flow paths between the identified stormwater management ponds and associated infrastructures must make use of vegetated swales as opposed to piping. All retention ponds must be outside the identified wetlands.				
7	Operation	Maintenance and management of infrastructure in or adjacent to aquatic ecosystems	Removal of sediment from structures within aquatic features to ensure proper functioning of the Maintenance of vegetation (alien invasive and nuisance indigenous plants) in buffers Minor repairs to approved infrastructure within aquatic features	Disturbance of aquatic habitat with possible water quality impacts associated with maintenance activities in accordance with the approved MMP	1	2	1	1	1.25	2	2	5.25	1	2.5	5	2	10.5	55.125	L	Alien vegetation must be removed from within the aquatic features and their buffer zones, with a focus on A. saligna and P. clandestinum. Rehabilitation of the buffer zones with appropriate riparian indigenous vegetation is recommended. Recommended indigenous vegetation includes <i>Olea europaea subsp. africana</i> , <i>Salix macrocarpa</i> , <i>Sarcocolla capensis</i> , <i>Celtis africana</i> , <i>Penisetum macrourum</i> , <i>Isolepis proflera</i> , <i>Cyperus textilis</i> , <i>Juncus effusus</i> , <i>Bolboschoenus maritimus</i> , <i>Carex clavata</i> , <i>Zantedeschia aethiopica</i> , <i>Chasmanthe aethiopica</i> and <i>Cynodon dactylon</i> . The development of infrastructure with hard foundations within these zones should be avoided and they should also not be used to dump rubble, soil or material of any kind except for those activities directly associated with the golf course development. No compacted golf course holes will be allowed within the identified buffer zones but greens associated with the golf course can extend into the buffers provided they are not planted with invasive kikuyu grass or an management edge is provided between the green area and the watercourse riparian zone. Such a management edge could comprise of a gravel/woodchip walkway. School fields can be inside the 1:100 year floodline but must remain outside of the buffer zones	Medium/High	
8		1.5			2	1.5	1.5	1.625	1	1	3.625	1	2	5	2	10	36.25	L				
9		1			1	1.5	1.5	1.25	1	1	3.25	2	2	5	2	11	35.75	L				
10		1.5			2	1.5	1.5	1.625	1	1	3.625	1	2.5	5	2	10.5	38.0625	L				
11	Stormwater runoff and discharges into aquatic features	Direct and indirect stormwater discharge into wetlands and watercourses	Flow and water quality impacts associated with stormwater discharge	2	2	1.5	1.5	1.75	1	2	4.75	2	2.5	5	2	11.5	54.625	L	An MMP must be drawn up for the entire estate to rehab, maintain and manage watercourses from the estate with input from the engineer and freshwater specialist and implemented by the homeowners association for the estate. The MMP must ensure that the watercourses must remain as an ecological corridor and much be managed as such. The instream dams must be landscaped to ensure habitat and biota diversity. REC for the valley bottom wetland must be maintained and managed in a C category. Grey water systems must be incorporated into the proposed development. The stormwater management system should be monitored and managed to ensure that it continues to function effectively as it is designed to work. Monitoring of the alien vegetation, debris that can block the infrastructure and any signs of erosion within the watercourses should be undertaken at least 6 monthly and dealt with as per the MMP.			

Signature of the specialist:   
 Date: 17-Sep-18