

ASPECTS AND IMPACT REGISTER/RISK ASSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS, DRAINAGE LINES

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

Date: September 2018

Nr.	Phases	Activity	Aspect	Impact	Severity				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															
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 Bottellary 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.	High	Watercourses and wetlands associated with the Bottellary River in G22E catchment; Bottellary PES=C&D/E and EIS=Moderate; Botterlary tributary PES=C/D&E; EIS=Low	
2		1.5			2	1	1	1.375	2	2.5	5.875	1	1	5	2	9	52.875	L					
3		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	Disturbance of soil and vegetation adjacent to aquatic features		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	1.875	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	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	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 <i>A. saligna</i> and <i>P. clandestinum</i> . Rehabilitation of the buffer zones with appropriate riparian indigenous vegetation is recommended. Recommended indigenous vegetation includes <i>Olea europaea subsp. africana</i> , <i>Salix macronata</i> , <i>Searsia augustifolia</i> , <i>Cliffortia odorata</i> , <i>Pennisetum macrourum</i> , <i>Isolepis prolifer</i> , <i>Cyperus textilis</i> , <i>Juncus effuses</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 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	Medium/high		
8		Removal of sediment from structures within aquatic features to ensure proper functioning of the structures	1.5		2	1.5	1.5	1.625	1	1	3.625	1	2	5	2	10	36.25	L					
9		Maintenance of vegetation (alien invasive and nuisance indigenous plants) in buffers	1		1	1.5	1.5	1.25	1	1	3.25	2	2	5	2	11	35.75	L					
10		Minor repairs to approved infrastructure within aquatic features	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		2	2	1.5	1.5	1.75	1	2	4.75	2	2.5	5	2	11.5	54.625	L				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