WATER USE AUTHORIZATION APPLICATION
RISK MATRIX

PREPARED FOR:
AT DARLING GREEN ESTATE

PROPOSED AT DARLING GREEN ESTATE ON FARM 4401, DARLING, MALMESBURY DISTRICT

NOVEMBER 2018

Eco Impact Legal Consulting (Pty) Ltd
Reg: 2010/015546/07
Directors: Mark Duckitt
Nicolaas Hanekom
Daniel Weber

Postal Address:
PO Box: 45070
Claremont
South Africa
7735

Office: +27 (0) 21 671 1660
Fax: +27 (0) 21 671 9976
Email: admin@ecoimpact.co.za
Web: www.ecoimpact.co.za

This Risk Matrix was requested by Department of Water and Sanitation (DWS) for the Water Use Authorization Application for the development. Activities trigger water use registration that impacts on the regulated zones. This Risk Matrix assists DWS to determine where the proposed development triggers a Water Use License Authorization (WULA) or Water Use General Authorisation (WUGA). The risk assessment is based on the Department of Water and Sanitation 2015 publication: Section 21c and i water use Risk Assessment Protocol in Government Gazette no. 40229 dated 26 August 2016.

This Risk Matrix must be read in conjunction with the Basic Wetland Assessment of Darling Country Club, Erf 401 and Portions 8 & 9 of Farm 577, March 2009 prepared by Toni Belcher.

- The construction of a Green Estate that will consists of:
- 119 (ranging between 1211m^2 and 11498m^2)
- 250 unit retirement village with roads, parking and clubhouse facilities
- Village post erven Crafters village (120 units)
- Food and craft market,
- Members braai area and swimming pool
- Stage and amphitheatre area
- Open space erf, and roads and services with an total development footprint of 66ha.

The wetland area on the site of the proposed estate is in a good state, while the seepage area in the north-east corner is slightly more degraded by past agricultural activities at the site. The Apolisvlei wetland is considered to be very important from a conservation point of view, while the seepage area is not particularly important but provides some important functions. The important ecosystem services the Apolisvlei wetland renders to the surrounding ecology and hydrological regime is clearly stated in the assessment as well as in Helme's botanical basic report, where Red Data Book listed Critically Endangered species *Cadiscus aquaticus* was found and identified inside the wetland depression. In addition, an undescribed species of *Cotula sp*. was also found in both the botanical basic report and this current investigation. For reasons listed in the report, the area surrounding the Apolisvlei wetland should be carefully developed. The wetland post-development should be in at least the same state (rated currently as a B-Good), or better than it is currently. Aspects which are particularly important relate to maintaining the unique character of the Apolisvlei wetland area. The proposed buffer area and management measures in cluded in the EMP will ensure that this is the case. The proposed rehabilitation and landscaping around the pan in the buffer areas will further increase the ecological state to B+. This means that the water levels that maintain the wetland as well as water quality entering the wetland area should not be altered. The best way to achieve this is to:

- ensure that the development set back is sufficiently wide enough to mitigate any water quality impacts from storm water runoff and prevent terrestrial encroachment of the wetland area. This would imply the maintenance or establishment of a wetland vegetation buffer of at least 30m (Cyperus spp., Juncus spp. and other relevant wetland vegetation);

- develop a storm water management plan that aims to keep storm water runoff into the vlei area to a minimum;
- limit hardening of surfaces in the surrounding development area to encourage infiltration rather than increase surface water runoff;
- reduce trampling of the surrounding area through construction of boardwalks and/or pathways;
- manage invasive alien vegetation growth through an invasive alien vegetation removal programme that addresses the eradication of all alien invasive vegetation within the wetland and surrounding area including indigenous weedy shrub species (*Galenia Africana*)
- rehabilitate any areas surrounding the wetland area with suitable indigenous plants and keep erosion to a minimum;
- actively manage the water quality impacts relating to the construction activities (nutrient loading, sedimentation, increased turbidity via the clearing of aquatic sedge species). In particular prevent any increased sediment loads from being deposited in the wetland area during the construction phase; and
- No major changes in landscape slope near the wetland area should be undertaken.

The Apolisvlei wetland was not identified during the Western Cape Wetland Inventory assessment but has recently been added to SANBI's Biodiversity GIS database. The wetland, Apolisvlei, on the site for the proposed country estate can be classified as a pan depression seep area. The wetland area has been formed by very distinct hydrological, water quality and sediment dynamics that characterizes the plant communities and other biota occurring within the wetland. This includes the ferricretes scattered across the wetland where the weathered porous granite derived features

The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the seepage area in the north-east corner of the property is moderately modified. The main impact on the both wetland areas on the property resulted, directly and indirectly, from the past land uses on this property as it was previously ploughed and farmed. The current land use of livestock grazing further impacts factors such as terrestrial encroachment, invasive plant encroachment and indigenous plant removal. Terrestrial encroachment of the outer edges of the wetlands as well as invasion by invasive plants were also found impacting from the surrounding area which results in some drying out of areas in the wetlands and vegetation transformation.

For reasons listed in the Freshwater Impact Assessment Report, the area surrounding the Apolisvlei wetland should be carefully developed. The wetland post-development should be in at least the same state (rated currently as a B- Good), or better than in current. Aspects which are particularly important relate to maintaining the unique character of the Apolisvlei wetland area. This means that the water levels that maintain the wetland as well as water quality entering the wetland area should not be altered. The best way to achieve this is to:

- ensure that the development set back is sufficiently wide enough to mitigate any water

quality impacts from storm water runoff and prevent terrestrial encroachment of the wetland area. This would imply the maintenance or establishment of a wetland vegetation buffer of at least 30m (Cyperus spp., Juncus spp. and other relevant wetland vegetation);

- develop a storm water management plan that aims to keep storm water runoff into the vlei area to a minimum;
- keep hardening of surfaces in the surrounding development area to encourage infiltration rather than increase surface water runoff;
- reduce trampling of the surrounding area through construction of boardwalks;
- manage invasive alien vegetation growth through an invasive alien vegetation removal programme that addresses the eradication of all alien invasive vegetation within the wetland and surrounding area including indigenous weedy shrub species (Galenia Africana)
- rehabilitate any areas surrounding the wetland area with suitable indigenous plants and keep erosion to a minimum;
- actively manage the water quality impacts relating to the construction activities (nutrient loading, sedimentation, increased turbidity via the clearing of aquatic sedge species). In particular prevent any increased sediment loads from being deposited in the wetland area during the construction phase; and
- No major changes in landscape slope near the wetland area should be undertaken.

The objective of the mitigation measures is to ensure that the wetland area should not be altered from its unique character but merely enhanced, so as to serve both the existing ecological and social goods and services. The impacts of the development on the seep area however should be mitigated such that the goods and services that it is able to provide should be retained as far as possible, while adding to the aesthetic value of the development.

It is however also considered not critical that the smaller wetland area be maintained. The seep exists as a result of the raised water table during the winter months and for it to be developed would require infilling of the area and will result in a loss of the goods and services that it does provide in attenuating flows and improving water quality for the area north of the property. It is felt that this area could possibly be retained as part of the proposed development and still be of beneficial use.

Risk Assessment Matrix - Total Severity Score with Mitigation

					Severity				
No	**Phases**	**Activity**	**Aspect**	**Impact**	**Flow Regime**	**Physico &Chemical (Water Quality)**	**Habitat (Geomorph + Vegetation**	**Biota**	**Total Severity Score**
1	Construction phase	Construction of the proposed infrastructure within 35m from the pan and seep.	Site clearance and construction of proposed infrastructure will impact on the pan and seep.	***Riparian zone*** Earthworks in the vicinity of the pan and seep leading to increased runoff and erosion and altered runoff patterns.	1- The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of surfaces. It is recommended that the impact of storm water runoff on the wetland be mitigated as for the water quality impacts. That	1- Water quality not in good condition as a result of the surrounding agriculture activities with no bugger areas.	1- The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the seepage area in the north-east corner of the property is moderately modified.	1- The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the seepage area in the north-east corner of the property is moderately modified.	1

					is through the creation of a wetland buffer area of at least 30m, and to mitigate the impact of increased hardening of surfaces, as far as possible permeable surfaces should be used for the construction of roads and pavements.							
2	Operational Phase	Operation of the proposed infrastructure within 100m and 500m regulated zones	Possible pollution and erosion of affected vlei and seep as a result of poor maintenance and infrastructure failure.	***Riparian zone*** Earthworks in the vicinity of the pan and seep leading to increased runoff and erosion and altered runoff patterns.	1- The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of surfaces. It is		1- Water quality not in good condition as a result of the surrounding agriculture activities with no bugger areas.		1- The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the		1- The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the		1

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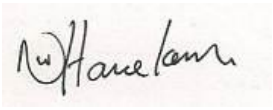
Risk Assessment Matrix – Final Risk Rating

No.	Severity	Spatial scale	Duration		Consequence		Frequency of activity	Frequency of impact	Legal issues	Detection		Likelihood	Significance	Risk Rating
1	1	1	1		3		1	3	1	2		7	21	Low
2	1	1	4		6		5	3	1	2		11	66	Moderate

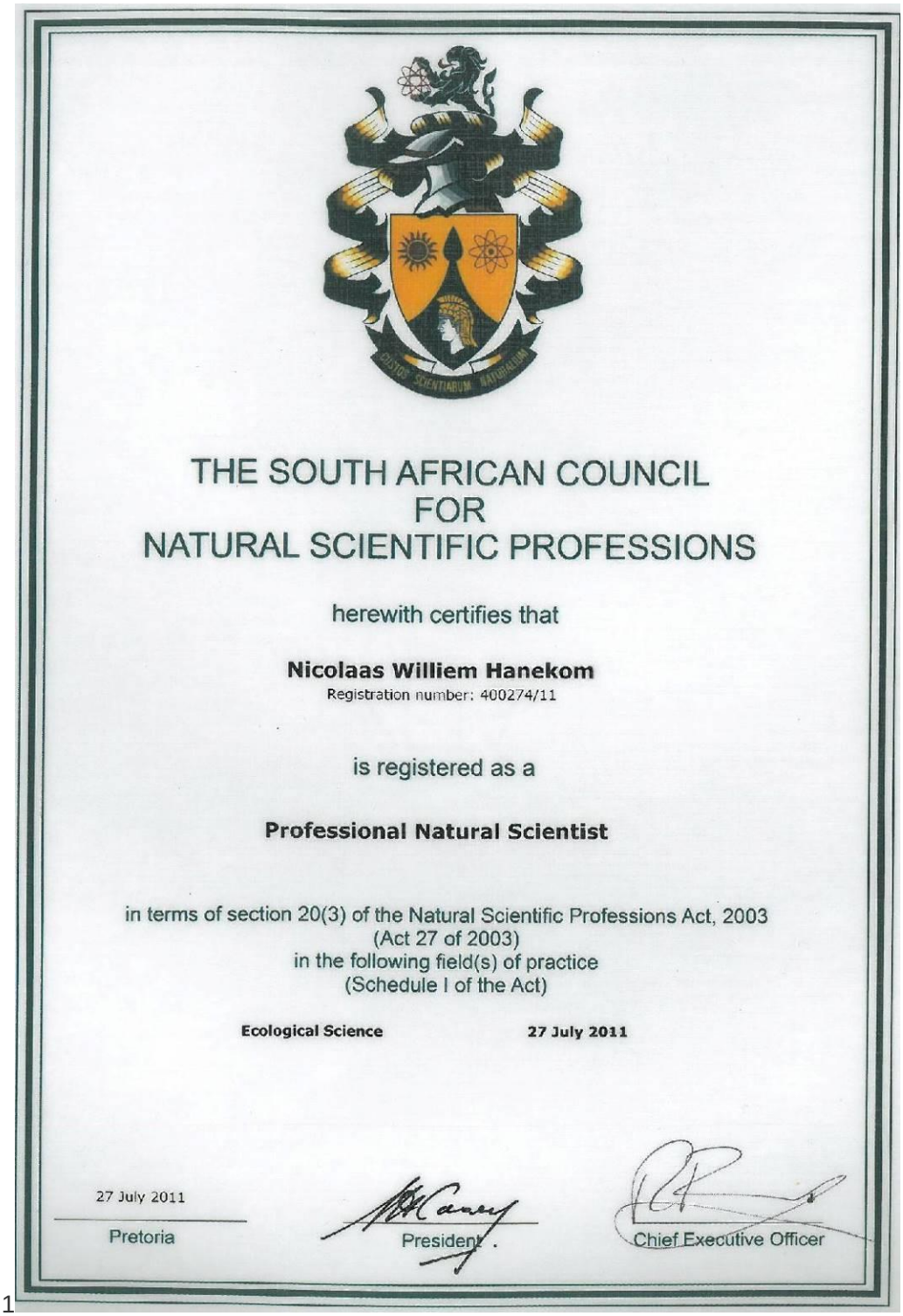
Risk Assessment Matrix – Confidence Level and Proposed Post Control/Mitigation Measures

No.	Risk Rating	Confidence level	Control measures	Borderline LOW – MODERATE Rating Classes	PES and EIS of Watercourses
1	21 Low	90%	Refer to EMP.	Low and unchanged	Refer to Basic Wetland Assessment of Darling Country Club, Erf 401 and Portions 8 & 9 of Farm 577, March 2009 prepared by Toni Belcher
2	66 Moderate	90%	Refer to EMP.	After considering both the construction and operational phases of the activity, the potential impacts/risks of the activity to the resource quality post mitigation measures, the sensitivity (EIS) and status (PES) of the vlei and seep receptor and the mitigation measure to be implemented we recommend that the risk rating stay unchanged at moderate.	Refer to Basic Wetland Assessment of Darling Country Club, Erf 401 and Portions 8 & 9 of Farm 577, March 2009 prepared by Toni Belcher

Recommendations in Terms of Water Use Application Requirements
The overall risk rating of potential Impacts on the applicable rivers after mitigation is rated as low and moderate negative. A sewer pipeline is proposed to cross and is located within 500m of the vlei and therefore the WUA must be a license.



Nicolaas Hanekom Pri Sci Nat (Ecology)
400274/11
Director
11 November 2018



THE SOUTH AFRICAN COUNCIL
FOR
NATURAL SCIENTIFIC PROFESSIONS

herewith certifies that

Nicolaas Williem Hanekom
Registration number: 400274/11

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice
(Schedule I of the Act)

Ecological Science **27 July 2011**

27 July 2011
Pretoria

President

Chief Executive Officer

1

RISK ASSESSMENT KEY **(Referenced from DWD 2015 publication: Section 21 c and i water use Risk Assessment Protocol)**

Negative Rating

TABLE 1- SEVERITY How severe does the aspects impact on the environment and resource quality characteristics (flow regime, water quality, geomorphology, biota, habitat)?	
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful and/or wetland(s) involved	5
Total severity score calculation – (Flow Regime) + (Physico&Chemical) + (Habitat) + (Biota) =? x 25 = ?/100 = Total Severity Score	
Where "or wetland(s) are involved" it means that the activity is located within the delineated boundary of any wetland. The score of 5 is only compulsory for the significant rating	

TABLE 2 – SPATIAL SCALE How big is the area that the aspect is impacting on?	
Area specific (at impact site)	1
Whole site (entire surface right)	2
Regional / neighbouring areas (downstream within quaternary catchment)	3
National (impacting beyond seconday catchment or provinces)	4
Global (impacting beyond SA boundary)	5

TABLE 3 – DURATION How long does the aspect impact on the environment and resource quality?	
One day to one month, PES, EIS and/or REC not impacted	1
One month to one year, PES, EIS and/or REC impacted but no change in status	2
One year to 10 years, PES, EIS and/or REC impacted to a lower status but can be improved over this period through mitigation	3
Life of the activity, PES, EIS and/or REC permanently lowered	4
More than life of the organisation/facility, PES and EIS scores, a E or F	5

TABLE 4 – FREQUENCY OF THE ACTIVITY How often do you do the specific activity?	
Annually or less	1
6 monthly	2
Monthly	3

Weekly	4
Daily	5

TABLE 5 – FREQUENCY OF THE INCIDENT/IMPACT How often does the activity impact on the environment?	
Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

TABLE 6 – LEGAL ISSUES How is the activity governed by legislation?	
No legislation	1
Fully covered by legislation (wetlands are legally governed)	5
Located within the regulated areas	

TABLE 7 – DETECTION How quickly can the impacts/risks of the activity be observed on the environment (water resource quality characteristics), people and property?	
Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

TABLE 8: RATING CLASSES		
RATING	**CLASS**	**MANAGEMENT DESCRIPTION**
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.

170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.

A low risk class must be obtained for all activities to be considered for a GA

TABLE 9: CALCULATIONS
Consequence = Severity + Spatial Scale + Duration
Likelihood=Frequency of Activity + Frequency of Incident +Legal Issues + Detection
Significance \Risk= Consequence X Likelihood