

**WATER USE AUTHORIZATION APPLICATION
RISK MATRIX**

**MARYKE BOERDERY CATTLE HOUSING EXPANSION,
MALMESBURY**

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This Risk Matrix was requested by Department of Water and Sanitation (DWS) for the Water Use Authorization Application for the proposed expansion of the cattle housing. 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.

A non-perennial river which is a tributary of the Groen River runs north east from the site. A 50m buffer area was left to protect this non-perennial river from possible impacts. This non-perennial river has almost no ecological functioning left. The Groen River forms part of the Berg River Water Management Area as located within quaternary drainage region G10L.

The site is generally flat with a gradual fall from north to south towards the Darling / Malmesbury road with a culvert underneath the road.

Habitat Assessment Of The Whole Non-Perennial River On The Property

Instream Habitat Integrity

Weights	14	13	13	13	14	10	9	8	6		
REACH	Water abstraction	Flow modification	Bed modification	Channel modification	Water quality	Inundation	Exotic macrophytes	Exotic fauna	Solid waste disposal	Total Score (%)	Classification
Impacted Site	0	25	25	25	25	2	25	25	2	28.72	E: Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.

None	Small	Moderate	Large	Serious	Critical
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Riparian Zone Habitat Integrity

Weights	13	12	14	12	13	11	12	13		
REACH	Vegetation removal	Alien encroachment	Bank erosion	Water abstraction	Flow modification	Channel modification	Water quality	Inundation	Total Score (%)	Classification
Impacted Site	25	25	22	0	22	25	25	2	27.2	E: Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.

None	Small	Moderate	Large	Serious	Critical
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From the results of the application of the IHIA to the impacted site, it is evident that the rivers reach is modified and that the loss of natural habitat, biota and basic ecosystem functions is extensive. Instream impacts included a large impact from flow modifications, as well as bed and channel modifications. Overall, the site achieved a 28.72 % score for instream integrity.

Riparian impacts included a large impact from flow modifications, and bed and channel modifications. Overall, the site achieved a 27.2 % score for instream integrity.

The site obtained an overall IHIA rating of 28.1%, which indicates the loss of natural habitat, biota and basic ecosystem functions is moderate. (Class E conditions).

Riparian Vegetation Response Assessment Index (VEGRAI)

LEVEL 3 ASSESSMENT					
METRIC GROUP	CALCULATED RATING	WEIGHTED RATING	CONFIDENCE	RANK	% WEIGHT
MARGINAL	20,0	7,5	2,7	2,0	60,0
NON MARGINAL	50,0	31,3	2,7	1,0	100,0
2.0					160,0
LEVEL 3 VEGRAI (%)				38,8	
VEGRAI EC				D/E	
AVERAGE CONFIDENCE				2,7	

The score attained for the VEGRAI indicated that the riparian system falls into the category D/E. This indicates that the loss of natural habitat, biota and basic ecosystem functions is largely modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.

Ecological Importance and Sensitivity (EIS)

Table 9: Results of the EIS assessment for the affected watercourse

Component	Score	Confidence	Comments/description
Channel type	1	5	Channelled non-perennial river.
Conservation context	0	5	No Status
Vegetation and habitat Integrity	0	5	Largely modified
Connectivity	2	5	Connection to Groen River.
Threat Status of Vegetation Type	5	5	Vegetation used to has critical endangered conservation status
EIS Category	0.32		Low/marginal

EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.

The non-perennial river is considered to be of low ecological importance.

Risk Assessment Matrix - Total Severity Score with Mitigation

No	Phases	Activity	Aspect	Impact	Severity				Total Severity Score
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	
1	Construction phase	Construction of cattle housing and effluent handling ponds	Infrastructure within 100m (50m) from the non-perennial river.	Possible pollution of the water course.	<p>Score = 1</p> <p>The Non-Perennial River that will be impacted by the proposed originate north of the property and flow in a southern direction, only during heavy rains in a single earthen channel.</p>	<p>Score = 1</p> <p>Water quality is poor as a result of the onsite farming activities. Cattle grazing on lands in and around the non-perennial river.</p>	<p>Score = 1</p> <p>The Non-Perennial River is totally transformed by agricultural activities on the property. The non-perennial river is considered to be of low ecological importance.</p>	<p>Score = 1</p> <p>The Non-Perennial River is totally transformed by agricultural activities on the property. The score attained for the VEGRAI indicated that the riparian system falls into the category D/E. This indicates that the loss of natural habitat, biota and basic ecosystem functions is largely modified. The loss of</p>	1

									natural habitat, biota and basic ecosystem functions is extensive.	
2	Operational phase	Housing of cattle in housing and effluent handling ponds	Infrastructure within 100m (50m) from the non-perennial river.	Possible pollution of the water course.	Score = 1 The Non-Perennial River that will be impacted by the proposed originate north of the property and flow in a southern direction, only during heavy rains in a single earthen channel.	Score = 1 Water quality is poor as a result of the onsite farming activities. Cattle grazing on lands in and around the non-perennial river.	Score = 1 The Non-Perennial River is totally transformed by agricultural activities on the property. The non-perennial river is considered to be of low ecological importance.	Score = 1 The Non-Perennial River is totally transformed by agricultural activities on the property. The score attained for the VEGRAI indicated that the riparian system falls into the category D/E. This indicates that the loss of natural habitat, biota and basic ecosystem functions is largely modified. The loss of natural	1	

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Risk Assessment Matrix – Final Risk Rating

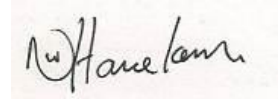
No.	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating
1	1	1	1	3	5	1	5	2	13	39	Low
2	1	1	1	3	5	1	5	2	13	39	Low

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 the EMP included in the EIA process	Low and unchanged	<p>EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.</p> <p>The non-perennial river is considered to be of low ecological importance.</p>
2	21 Low	90%	Refer to the EMP included in the EIA process	Low and unchanged	<p>EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.</p> <p>The non-perennial river is considered to be of low ecological importance.</p>

Recommendations in Terms of Water Use Application Requirements

The overall risk rating of potential Impacts on the applicable river after mitigation is rated as low negative. It is recommended that a GA being issued for the proposed water use.



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Director

23 October 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

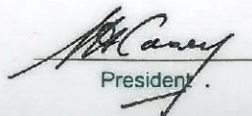
in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice
(Schedule I of the Act)

Ecological Science

27 July 2011

27 July 2011

Pretoria


President


Chief Executive Officer

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 secondary 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.
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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