



# Scientific Aquatic Services

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**Name:** Stephen van Staden

**Date:** Friday, 07 December 2018

**Ref:** SAS Eco Impact 071218

## MEMORANDUM

**Attention:** Mr N. Hanekom

**RE: SPECIALIST EXTERNAL REVIEW OF THE FRESHWATER IMPACT ASSESSMENT FOR THE PROPOSED SWELLENDAM HOUSING AND BULK SEWER PIPELINE CONSTRUCTION, SWELLENDAM.**

Scientific Aquatic Services was requested to undertake a specialist external review of the specialist freshwater ecological impact assessment by Mr. N. Hanekom. The review was focused on the following Objectives:

1. Determining acceptability of the terms of reference;
2. Assess the document/ report in terms of its fulfilment of the Terms of Reference set;
3. Consider whether the report is entirely objective;
4. Determining whether the method of assessment used clearly explained and acceptable;
5. Evaluate the appropriateness of the reference literature;
6. Evaluate the validity of the findings and consider whether the report is technically, scientifically and professionally credible (review data evidence);
7. Identify any information gaps, short comings and mitigation measures to address the short comings;
8. Indicate whether the article is well-written and easy to understand and to ensure that the work has adequately assessed the impacts of the proposed development;
9. Discuss the suitability of the mitigation measures and recommendations and Consider whether the recommendations presented are sensible and present the best options; and
10. To provide an overall independent opinion of the report, whether it is well written and easy to understand and ensure the work meets current requirements/best practice and normal standards of professional practice and competence have been met.

A CV presenting the expertise of the peer reviewer has been included as an appendix to this short Memo.

This external review is based on a desktop assessment of the documentation only and no field verification of the results was undertaken. The delineation of the wetlands, and to some degree the characterisation of the wetlands, is thus assumed to be accurate based on the methods employed. Less attention was paid to formatting and grammatical issues as these have no bearing on the scientific validity and independency of the work done. The table below highlights the findings of the review process given the above objectives.

Regards,

Stephen van Staden  
Pr. Sci. Nat

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Co-Reviewer: Kim Marais SACNASP 117137/17



**Table 1 Review Outcomes of the specialist freshwater resource study prepared.**

ASSESSMENT CRITERION	COMMENTS	RECOMMENDATIONS
<p>1. Determining acceptability of the terms of reference.</p>	<p>In broad terms the Terms Of Reference (TOR) are acceptable but to some degree are vague and some gaps are notable.</p> <ol style="list-style-type: none"> <li>1. The locality of the proposed project and the associated plans have not been adequately labelled/ represented on any maps within the report making it unclear to the reader where the proposed project footprint is in relation to the surrounding watercourses. This makes interpretation of the results indicated in the report difficult to place in relation to the development layout.</li> <li>2. Although the National Water Act, 1998 (Act 36 of 1998) (NWA) was considered as part of the assessment, the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) was not referred to nor was mention made of any NEMA or NWA zones of regulation therein that may be applicable.</li> <li>3. The TOR did not specify that an area of 500m from the proposed development area be investigated to determine if any wetlands occur within this area which would potentially trigger GN509 as promulgated in 2016;</li> <li>4. No true assumptions and limitations section were provided in this report.</li> </ol>	<p>It is deemed more appropriate that the following tools for wetland assessment be considered for application:</p> <ol style="list-style-type: none"> <li>1. It is recommended that all maps have clear labels on all maps indicating the various aspects associated with the development.</li> <li>2. It is recommended that the requirements of the freshwater impact assessment also consider the National Environmental Management Act, 1998 (Act 107 of 1998) as the EIA regulations, 2014 (as amended).</li> <li>3. Department of Water Affairs and Forestry (DWAF). 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas.</li> <li>4. It is recommended that any assumptions and limitations be provided in order to provide the reader with a better indication of and the significance of knowledge gaps.</li> </ol>
<p>2. Assess the document/ report in terms of its fulfilment of the Terms of Reference set.</p>	<p>In terms of the fulfilment of the Terms Of Reference (TOR) the following limitations were identified:</p> <ol style="list-style-type: none"> <li>1. The literature information is considered useful for the classification of systems, however, for classification purposes the classification of the watercourse should be undertaken using Ollis <i>et al</i> (2013) after validation of all watercourses during the site verification.</li> <li>2. The IHIA method used is not considered appropriate for the assessment of the Present Ecological State of a non-perennial watercourse and cannot be used in isolation - SASS5 as well as VEGRAI need to be undertaken with the IHIA assessment for it to be considered a credible tool for the Ecstatus.</li> <li>3. It is considered good practice to determine the socio-cultural and ecoservice provision of all watercourses identified as this provides input into the EIS determination. This assessment is lacking in the report.</li> <li>4. The Wetland EIS method used is outdated and should be replaced with the most up to date version.</li> <li>5. The relevance of the sampling date in relation to the seasons and the accuracy of the work has not been clearly stated.</li> </ol>	<p>It is deemed more appropriate that the following tools for wetland assessment be considered for application:</p> <ol style="list-style-type: none"> <li>1. Ollis <i>et al</i> 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems should be applied to characterise the wetlands.</li> <li>2. Department of Water Affairs and Forestry (DWAF). 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare. Report no. X. Stream Flow Reduction Activities, Department of Water Affairs and Forestry, Pretoria, South Africa.</li> <li>3. The methodology for Wet-Health (Macfarlane <i>et. al</i> 2009) or the wetland-IHI (DWAF, 2007) should be used for the assessment of the PES of the systems.</li> <li>4. Rountree, M.W. and Kotze, D.C. (2013). Appendix A3: Ecological Importance and Sensitivity Assessment. In: Rountree, M. W., Malan, H.L., and Weston, B.C. Eds. Manual for the Rapid Ecological Reserve Determination of Inland Wetlands (Version 2.0). WRC</li> </ol>



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	6. The report does not make specific mention of any site specific verification and delineation techniques utilised to define the extent of the watercourses identified.	Report No. 1788/1/12. Pretoria. 5. Kotze D.C., Marneweck G.C., Batchelor A.L., Lindley D.S. and Collins N.B. (2009). WET-EcoServices: A technique for rapidly assessing ecosystem services supplied by wetlands. WRC Report No. TT 339/08. Water Research Commission, Pretoria, RSA.
3. Consider whether the report is entirely objective.	The freshwater study as a whole can be considered objective although use of subjective and/or emotive language was noted which is inappropriate for an article of this nature. Reference is made to the use of "totally destroyed" when describing the riparian zone characteristics.	Objective language should be favoured for all descriptions of the watercourse characteristics.
4. Determining whether the methodology is clearly explained and acceptable.	The method of assessment, including site specific adaptations need to be readdressed and more suitable assessments utilised in order for this report to be considered as appropriate.	Please refer to recommendations made above relating to lacking/incorrect use of tools for wetland assessment.
5. Evaluate the appropriateness of the reference literature.	The information from the desktop databases provided was considered appropriate, however, some shortcomings were identified, including: <ol style="list-style-type: none"> <li>1. No use was made of the DWS RQIS PES/EIS database to provide information pertaining to the rivers of the area. In light of the fact that very limited investigation considering the aquatic ecostatus of these systems was undertaken, this is considered an oversight as the data could provide valuable information to consider in defining the PES and EIS of the river systems.</li> <li>2. Some missing and/or outdated references as well as inconsistencies of use were identified. Specific mention is made to discrepancies in the citations within the report as well as cross referencing these citations to the list of references provided within documents.</li> </ol>	The newest reference material must be corrected cited and referenced in the report, including: <ol style="list-style-type: none"> <li>1. Macfarlane D.M., Kotze D.C., Ellery W.N., Walters D., Koopman V., Goodman P. and Goge C. (2008). WET-Health: A technique for rapidly assessing wetland health. WRC Report No. TT 340/09. Water Research Commission, Pretoria, RSA.</li> <li>2. Kotze D.C., Marneweck G.C., Batchelor A.L., Lindley D.S. and Collins N.B. 2009. WET-EcoServices: A technique for rapidly assessing ecosystem services supplied by wetlands. WRC Report No. TT 339/09. Water Research Commission, Pretoria.</li> <li>3. The EIS should be re-determined using: Rountree, M.W. and Kotze, D.C. 2013. Appendix A3: Ecological Importance and Sensitivity Assessment. In: Rountree, M. W., Malan, H.L., and Weston, B.C. Eds. Manual for the Rapid Ecological Reserve Determination of Inland Wetlands (Version 2.0). WRC Report No. 1788/1/12. Pretoria.</li> </ol>
6. Evaluate the validity of the findings and consider whether the report is technically, scientifically and professionally credible (review data evidence).	The manner in which the freshwater assessment has been undertaken presents some concerns with the following identified: <ol style="list-style-type: none"> <li>1. Although the reviewer did not undertake a site visit, the classification of some of the systems are questioned as wetland indicators are noted within the listed non-perennial systems that are indicative of wetland habitat and not riparian habitat (based on the pictures provided in the report). No evidence of soil augering was provided nor was a map included showing sampled co-ordinates.</li> <li>2. No conservation buffer zones and/or zones of regulation, which will have bearing on the proposed development, were presented. This makes the</li> </ol>	<ol style="list-style-type: none"> <li>1. It is recommended that soil augering be undertaken and evidence thereof included in the report for all identified watercourses. A field verification should be undertaken to validate the classifications provided, specifically for the non-perennial systems as some seem to display wetland indicator species.</li> <li>2. It is recommended that the relevant zones of regulation in the legislative context section of the report be presented to inform the reader of areas which would trigger the need for environmental authorisation and/or a water use authorisation; and</li> <li>3. Although the reviewer did not undertake a site visit it is deemed</li> </ol>



ASSESSMENT CRITERION	COMMENTS	RECOMMENDATIONS
	<p>results of the impact assessment challenging to verify.</p> <ol style="list-style-type: none"> <li>3. The report considers all infrastructure impacts associated with water and sewer pipelines, attenuation dams and access roads but does not consider the 950 unit residential development. It is recommended that this be more clearly represented in the findings and the impact assessment.</li> <li>4. The report does not include the DWS Risk Assessment Matrix required to inform a Department of Water and Sanitation for a water use authorisation.</li> </ol>	<p>possible that the PES of the wetlands have been overstated. This is especially in the case of the scoring of the IHIA for the Koorlands Perennial River. The author has indicated that this system is considered to be in a largely natural state, however, the photographs provided allude to a system that has experienced significant modifiers. It is recommended that this calculation be revisited, and the PES redefined with more suitable tools of assessment, such as Wet-Health (Macfarlane <i>et. al.</i> 2009).</p> <ol style="list-style-type: none"> <li>4. It is recommended that the DWS promulgated Risk Assessment Matrix be included in the report to provide insight into the Water Use Licencing requirements.</li> </ol>
<ol style="list-style-type: none"> <li>7. Identify any information gaps, short comings and mitigation measures to address the short comings.</li> </ol>	<p>Some substantial information gaps have been identified in the report. Recommendations have been presented which would lead to a better understanding of the site findings and thus the protection of the freshwater resources.</p>	<ol style="list-style-type: none"> <li>1. Suitable tools for wetland assessment have not been adequately utilised. The author is advised to utilise the latest method of assessment for the determination of the EIS, to calculate the socio-cultural provision</li> <li>2. In the legislative context section, it is recommended that the various zones of regulation pertinent to wetland resources in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the National Water Act, 1998 (Act 36 of 1998) be clearly defined.</li> </ol>
<ol style="list-style-type: none"> <li>8. Indicate whether the article is well-written and easy to understand and to ensure that the work has adequately assessed the impacts of the proposed development.</li> </ol>	<p>The freshwater specialist study is well written and easy for the reader to follow. Some recommendations have been presented which would lead to a more complete final product.</p>	<p>Consideration should be given to including more maps in the report that clearly define the location of the sewer and water pipeline crossings, locations of the attenuation facilities as well as the location of the residential development in relation to the surroundings as well as the watercourses. In addition, maps indicating points and areas investigated using methods such as soil auguring should potentially be included.</p>
<ol style="list-style-type: none"> <li>9. Discuss the suitability of the mitigation measures and recommendations and Consider whether the recommendations presented are sensible and present the best options.</li> </ol>	<p>It is the opinion of the independent reviewer that the following aspects should be considered for the mitigation measures:</p> <ol style="list-style-type: none"> <li>1. The mitigation measures indicated that all sensitive zones be demarcated but at no point in the report have these sensitive zones been defined. Similarly, reference is made to the lack of any information pertaining to the implementation of a 32m buffer area as well as the regulated area.</li> <li>2. The reviewer questions if the impact listed as “disturbance to subsurface geological layer” as stipulated on Page 38 of the report refers to surface soil disturbance as well. If so, the reviewer disagrees with the statement that not much can be done to mitigate the impact.</li> <li>3. Substantial gaps in the mitigation measures were identified, including those pertaining to stormwater run-off. No insight is provided about the proposed design of the attenuation ponds or if sustainable drainage systems will be</li> </ol>	<ol style="list-style-type: none"> <li>1. It is recommended that the relevant wetland delineations be defined as sensitive areas and that all applicable zones of regulation and conservation buffers be stipulated beforehand. This will provide some much needed clarification to the reader prior to interpretation of the mitigation measures to be implemented.</li> <li>2. Consideration should be given to stormwater run-off from the development, stockpiling of soils, backfilling of trenches, compaction and potential for incision and erosion and suitable mitigation measures provided.</li> </ol>



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<p>10. To provide an independent opinion of the report, whether it is well written and easy to understand and ensure the work meets current requirements/best practice and normal standards of professional practice and competence have been met.</p>	<p>utilised within the development.</p> <p>Based on the findings of this review it is the opinion of the independent reviewer that:</p> <ol style="list-style-type: none"> <li>1. The manner in which the specialist report has been set up is dubious and some important evidence in the results is lacking. Evidence in order to support all results should be included and should be undertaken using the most appropriate assessments.</li> <li>2. The specialist report is for the most part well laid out, although some aspects have been recommended to allow for easier assimilation by the reader. It is further recommended that more attention be paid to finer detail within the report, such as provision of maps and labelling of tables and figures, since some discrepancies were detected in this regard.</li> <li>3. The mitigatory measures presented are, for the most part considered appropriate, relevant/necessary, sensible and achievable. It is however, recommended that additional, site specific mitigation measures be added to increase the protection of the freshwater resources of the area during the construction and operational phases.</li> <li>4. Substantial limitations were identified within the report making it the final outcomes of the assessment unclear to the reader. It is recommended that all classifications and delineations be verified and/or additional information provided by the author in order to substantiate his findings.</li> </ol>	<p>The recommendations above should be considered and where the author deems them appropriate, included in the final specialist report to be submitted.</p>



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**CV OF the Reviewer**

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<b>Date of Birth</b>	13 July 1979
<b>Place of Birth</b>	South Africa
<b>Profession</b>	Managing member, Ecologist, Aquatic Ecologist
<b>Education</b>	MSc (Environmental Management) (University of Johannesburg) 2003 BSc (Hons) Zoology (Aquatic Ecology) (University of Johannesburg) 2001 BSc (Zoology, Geography and Environmental Management) (University of Johannesburg) 2000 Tools for wetland Assessment short course Rhodes University 2016
<b>Registrations/ Affiliations</b>	Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP) Accredited River Health practitioner by the South African River Health Program (RHP) Member of the South African Soil Surveyors Association (SASSO) Member of the Gauteng Wetland Forum Member of IAIA South Africa
<b>Awards</b>	None
Specialisation	Aquatic & Wetland Ecology, Ecological Water Requirements  Water Use Licence Applications, Rehabilitation planning, Water infrastructure refinement and design criteria input and Aquatic biomonitoring
Expertise	14 Years' experience in the field of aquatic ecological assessment covering most areas of southern Africa as well as West Africa <ul style="list-style-type: none"> <li>• project management and co-ordination of several mining and mixed-use development;</li> <li>• water quality monitoring, analyses and sampling;</li> <li>• biomonitoring assessments;</li> <li>• sampling and interpretation of toxicity tests;</li> <li>• performance assessments and auditing;</li> <li>• refinement and design input of stormwater infrastructure;</li> <li>• aquatic and freshwater investigations as input to EIAs, EMPs and EMPRs;</li> <li>• impact assessment on mining, residential, infrastructure, industrial and energy related infrastructure;</li> <li>• government department liaison.</li> </ul>
Employment	
<b>2003</b>	October 2003- Current. Founding member of Scientific Aquatic Services CC. Environmental resource management, specializing in aquatic, water resource, wetland and terrestrial resource assessment, management and monitoring
<b>2003</b>	July 2003-July 2004 Co-Founding member of Scientific Fishery Services CC.
<b>2002/3</b>	September 2002 - December 2003 EcoSat Environmental Services group
<b>2002</b>	August - Co-project leader EMP for the temporary use of the Wanderers Sports Club for the World Summit on Sustainable Development
<b>2002</b>	March-August Junior Consultant (Holgate and Associates environmental consultants)
<b>2002</b>	Assistant on Jukskei Environmental Management Framework (Nemai Consulting);
<b>2001</b>	Student assistant Zoology: ecology
Languages	English – read, write, speak  Afrikaans – read, write, speak

