



## Coastal and Estuarine Research

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### **RE: Response to comments received regarding the wetland biodiversity reports prepared for the George Rex Development**

#### **Background**

Following a meeting on Friday 23 March 2007 with regional representatives from DWAF, DEA&DP, Knysna Municipality, SANParks and CapeNature, it was decided to include a fifth development alternative into the Environmental Impact Report. DWAF representatives also requested that a second report be commissioned to investigate the present, past and future potential freshwater wetland distribution along the eastern shore of the Knysna Estuary to place the wetlands on Erf 12403 in context. This was done and both reports were sent to the relevant authorities (see reference list for report details). A second meeting was requested between the relevant stake holders (authorities) and the developers. This meeting was held on 8 June 2007 and the following minutes were taken:

*“DWAF still has to respond to specialist study done by Tom Bornman. NF (DWAF) stated that the Dr Bornman’s report re the sewer farm is incorrect – wording to be corrected. DWAF requested that Dr Bornman must specify or clarify whether the Municipal Sewer farm was meant to be included, or formed part of the results in his study. As it stands now, according to DWAF’s interpretation, the sewer farm is meant to be part of the developers proposal. Neale Perring, (Knysna Municipal Engineer) concurred that the wetland mitigation can extend beyond the developers boundary onto Municipal land next to driving range as indicated on the plan but not into the Sewer farm property. At this stage there is no way where he can accept any encroach on the sewer works because the Municipality already submitted budgets and plans for the upgrading of the sewer plant and he is not interested in the new technology and that the unsolicited proposal for the revamp of the sewer works is not acceptable.”*

The purpose of this letter / document is to attempt to clarify the matter mentioned in the minutes above.

#### **Response**

The last paragraph in the Executive Summary of the Biodiversity Impact Assessment of Development Alternative 5 on the wetlands and vegetation of Erf 12403, Knysna (CER Report no. C01/07) read as follow:

*“An important mitigation measure that forms part of the proposed development would be the upgrading of the Knysna Sewage treatment plant. At the present the sewage plant is the major contributor of nutrient and bacterial pollution to the groundwater and the Knysna Estuary. Once upgraded, approximately 11 ha*

*additional area will become available for the rehabilitation of wetlands. The oligotrophic (as opposed to eutrophic) groundwater will result in increased freshwater wetland diversity and functioning. The rehabilitated wetland areas that will form part of the proposed development will be more than adequate to attenuate and treat stormwater flows from the adjacent developments. In addition it is recommended that a network of freshwater wetlands be created that form a corridor all along the eastern shore of the Knysna Estuary.”*

This paragraph is misleading in several aspects. Firstly, it seems that I drew the wrong conclusions from the meeting held on 23 March 2007 regarding the upgrade of the Knysna sewage works. During the meeting the developers informed DWAF that they have been investigating the idea of upgrading the sewage plant and that they have contacted the Knysna Municipality regarding this matter, but had no response from them. Mr R. Khan from DWAF responded by saying that the idea was a good one and that it should be pursued. I assumed that the concept plan for upgrading the plant was accepted by the Knysna Municipality, but the minutes quoted above from the meeting held on 8 June 2007 indicate otherwise. Secondly, it was not my intention to make it sound as if the sewage works property formed an integral part of the proposed development of Erf 12403. The wetland area to be conserved as part of Development Alternative 5 (excluding the 11 ha of the Knysna Sewage Works) is more than suitable to attenuate and treat stormwater flows as long as the source of the pollution and the leak from the sewage farm is rectified. This issue was not included for the first time in the latest report but has formed part and had been highlighted from the very first report compiled in 2004. Below are excerpts from the two latest biodiversity reports indicating the importance of the issue of untreated waste water flowing through Erf 12403 and into the Knysna Lagoon.

***Loss of water quality enhancement (Page 6 in C01/07 and pp 42, 45, 48 & 49 in C07/06)***

*Removal of the reed and sedge community as well as other wetland components will increase the nutrient concentration of the groundwater that eventually reaches the Knysna Estuary. The present wetland does not scrub all the pollutants and nutrients from the groundwater and a properly designed artificial wetland will be required to suitably treat the eutrophic water. Alternatively the source of the pollution (i.e. the Knysna Sewage Treatment Works) must be found and the problem rectified (See Section 3.17.).*

***Health & safety issues (Page 6 in C01/07 and pp 42, 46, 48 & 49 in C07/06)***

*The potential of the groundwater to contain unacceptably high levels of harmful bacteria, such as Escherichia coli, poses a serious health risk to construction workers labouring on the canals. The open water canals in the operational phase will pose a serious health risk to humans if the source of the pollution is not found and the problem rectified.*

***Loss of water quality enhancement (Page 10 in C01/07 and 53 in C07/06)***

- *Retain as much as possible of the original wetland vegetation in the areas earmarked for wetland rehabilitation and conservation.*
- *Construction activities should not trespass into these areas.*
- *The development should not proceed until the source of the eutrophic water is found and the problem rectified (See Section 3.17.)*
- *Once rectified, there will be no need for large areas of reeds and other wetland plants specifically for the maintenance of the groundwater quality.*
- *The storm water flowing through the property (either as groundwater or surface water) will contain elevated concentrations of pollutants and nutrients and the rehabilitated wetland areas*

*must be maintained in a healthy state to ensure an acceptable water quality on Erf 12403 and of the water flowing into the Knysna Estuary.*

**Health & safety issues (Page 11 in C01/07 and 53 in C07/06)**

- *Prohibit full contact with the groundwater unless tested to be safe (tests should be done once a week and especially after high rainfall events).*
- *Prohibit unauthorised entry to the construction site during non-working hours.*
- *Place educational signage in and around the construction site warning people not to come in contact with the polluted water.*
- ***Treat the source of the pollution.***
- *As it is common practise to allow leaky sewers to flow into the storm water drains it is recommended that the canal water be regularly (quarterly) monitored for E. coli, total faecal coliforms and Enterococci.*
- *Educational signage should be placed along the wetland conservation areas warning residents and visitors that the open water (during the high rainfall period) is unsafe for drinking purposes.*

It is absolutely imperative that the source of the pollution is found and the problem rectified. The developers of Erf 12403 offered their help and expertise in solving this important problem, but I do not believe that it is their duty to carry the costs for such a project. The majority of the present wetland area owes its existence to the polluted (nutrient enriched) groundwater. Although it would appear from the limited sampling done during the baseline study that the wetlands are to some extent effective in the removal of the majority of pollutants, it is not the function of the wetlands to treat raw sewage. It is also not environmental best practice to depend on the wetlands of Erf 12403 to clean untreated sewage as it poses a serious health risk to humans and allows a diffuse discharge of pollutants (of unknown quantity and quality) into the Knysna Estuary. Ideally all storm water and treated sewage must be conveyed in a suitably constructed conveyance system for discharge at predetermined locations, where the quality and quantity of water and pollutants can easily be monitored. If it is the intention to use the wetlands to scrub untreated and treated effluent of nutrients and other pollutants it would be advised to create an artificial wetland that is properly designed for that specific purpose and where the influent and effluent can be monitored accurately.

An additional section was included in the Biodiversity Impact Assessment report (C01/07) for Alternative 5 following the meeting held on 23 March 2007, i.e. the potential upgrade of the Knysna sewage treatment works. That Section read as follows:

***“Upgrade of the Knysna sewage treatment works (Page 15 in C01/07)***

*The development should not proceed until the source of the eutrophic water is found and the problem rectified. Once rectified, there will be no need for large areas of reeds and other wetland plants specifically for the maintenance of the groundwater quality. All indications are that the Knysna sewage treatment works is the source of the groundwater pollution on Erf 12403 and the Knysna Estuary. Urgent intervention is required to rectify this problem as the Knysna Estuary is becoming so polluted with bacteria that it poses a serious health risk to all users (P. Joubert, pers. comm.).*

*The developers of Erf 12403 have proposed to the Knysna Municipality that they **will** construct a new modern sewage treatment plant for the town of Knysna as part of the development of Erf 12403. The modern plant will be significantly smaller (75%) than the old treatment works and will make a large area of land available for the further rehabilitation and construction of artificial wetlands (Figure 2). Building a new sewage treatment works will rectify the problem of eutrophic groundwater and the only function of the wetlands on Erf 12403 will then be stormwater attenuation and the maintenance of biodiversity patterns*

*and processes. It will be important to link the wetlands of Erf 12403 to those on the adjacent properties to increase the value and functioning of freshwater wetlands adjacent to the Knysna Estuary.”*

Unfortunately I made the same mistake in this section as in the Executive Summary by stating that the developer will construct a new plant. This is not entirely true as they have only offered their help. The Knysna Municipality has indicated (see minutes) that they have requested that a budget be allocated for the upgrade of the sewage treatment works. This is good news despite the fact that new technology will not be investigated.

**In summary:** The proposed development of Erf 12403 could produce numerous benefits to the environment and the town of Knysna if all the mitigation measures mentioned in the various reports are implemented. One of the most important mitigation measures is preventing the flow of polluted groundwater from entering the property. Ideally this should be done by upgrading the sewage plant, but no-one can expect the developers of a 20 ha plot (of which 50% will consist of rehabilitated wetlands) to pay for something that will benefit the entire town of Knysna and is the responsibility of the Knysna Municipality. The Knysna Estuary is one of the most important and conservation worthy estuaries in the country but it has been at the receiving end of extremely polluted effluent flowing from the Knysna sewage works and septic tanks for the past few years. In my opinion the damage done by the leak in the plant and the discharge of so called “treated” effluent far exceeds the impact of the proposed development (Alternative 5).

The question remains whether the approval of the development should be dependant on the upgrading of the sewage treatment works. I believe the upgrade of the sewage treatment works is vital and pressure should be exerted on those responsible to expedite the process. All the reports stated that the source of the pollution must be found and rectified before the development can proceed. This was included mostly because the developers had initially planned to make use of open water canals. Development Alternative 5 proposes to maintain emergent wetland vegetation as is in the conservation areas and only one stormwater retention pond is planned. The eutrophic groundwater would have been a serious problem in open water canals, but not so much in emergent wetland areas. Unfortunately, the wetlands would remain in a degraded state as long as the groundwater on which they depend remain eutrophic. One can expect that the upgrading of the sewage works will be a long process and other methods (e.g. engineering solutions) should be found in the mean time to reduce the pollution from this source. I believe it will be possible to continue with the development and defer the rehabilitation of the wetlands to after the sewage plant has been upgraded.

I hope that this letter has clarified some of the confusion. If there are any further questions you are more than welcome to contact me.

Kind regards

A handwritten signature in black ink, appearing to read 'Bornman', with a stylized flourish above the name.

TG Bornman

## **References**

- Bornman, T.G. 2006. Biodiversity Impact Assessment of the wetlands and vegetation of Erf 12403, Knysna. Confidential report prepared for Pieter Badenhorst Professional Services CC. CER Report No. C07/06. 103 pp.
- Bornman, T.G. 2007. Biodiversity Impact Assessment of Development Alternative 5 on the wetlands and vegetation of Erf 12403, Knysna. Confidential report prepared for Pieter Badenhorst Professional Services CC. CER Report No. C01/07. 37 pp.
- Bornman, T.G. 2007. Assessment of the present, past and future potential freshwater wetland distribution along the eastern shore of the Knysna Estuary. Confidential report prepared for Pieter Badenhorst Professional Services CC. CER Report No. C02/07. 10 pp.