Statement regarding the impacts of the proposed Sibaya Node development on the Mhlanga estuary

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1 INTRODUCTION

This report provides an assessment of the potential impacts of the proposed Sibaya Precinct development on the Mhlanga Estuary. The impacts addressed in this report are those carried forward from the scoping phase of the environmental assessment process for that development, namely the impacts associated with changes to the runoff from the site on the estuary.

2 ASSUMPTIONS AND LIMITATIONS

This assessment has been based on the predicted changes in runoff undertaken as part of the hydrological assessment and stormwater management plan (Sagen Projects, 2007).

3 DESCRIPTION OF THE MHLANGA ESTUARY

The Mhlanga Estuary is a small (approximately 70Ha) estuary with a total catchment area of some 80km^2. The estuary is classified as a temporary open closed estuary and is only open to the sea approximately 30% of the time. As the estuary is perched (the bottom of the estuary is largely above mean sea level), once breached the estuary drains almost completely.

Harrison, Cooper, Ramm and Singh (2000) characterised the Mhlanga estuary as having poor water quality, a good fish community and as having a moderate aesthetic value. Two of the key issues currently impacting upon the ecological status of the estuary are those of the characteristics (both flow volume and variation) of the fresh water flow into the estuary and the quality of that water.

In a recent (2004/5) assessment of the fresh water requirements (estuarine flow requirements) of the estuary, it was concluded that the condition of the estuary was suboptimal and that, in order to ensure that there was no further degradation of the system, no further significant increases in the volume of the fresh water inflow into the system should be considered.

4 OUTCOMES OF THE HYDROLOGICAL ASSESSMENT FOR THE SIBAYA PRECINCT

The following has been extracted from the report prepared by Sagen Projects (2007).

The unmitigated development would lead to:

- An average increase of surface water runoff equivalent to 98mm per annum;
- An increase from the current runoff from the site into the Ohlanga River catchment of 169 mm/year to 279mm/year (1.44Ml/day additional runoff);
- The importation of approximately 5.5Ml/day of potable water which will contribute a further 4.75Ml/day of sewage flows into the Ohlanga River catchment; and
- An unspecified volume of water associated with irrigation activity.

Sagen Projects (2007) also concluded that these impacts can be successfully mitigated through the implementation of the policy, regulations and guidelines contained in the stormwater management plan compiled for the development. These include:

- Improved wetland functionality
- Adoption of a zero net-loss approach on wetland areas
- Rehabilitation of the natural watercourses to prevent erosion and retain runoff
- Promotion of subsoil infiltration at every opportunity
- Provision of vegetation and stabilisation of all slopes
- Increased functionality of land use to encourage evaporation and evopo-transpiration
- Flood risk assessment
- Acknowledgement of flood risk versus environmental potential in assigning land-uses
- Attenuation of flood peaks to predevelopment levels or less
- No impermeable areas without sufficient flood attenuation and evaporation potential
- Rehabilitation of the development area following conversion from sugarcane

To fully mitigate the negative impacts of development:

- The potential increase in catchment runoff must be balanced against the combined effects of evapo-transpiration from catchment vegetation, evaporation from water bodies plus the retention and re-use of both storm runoff and treated wastewater.
- The potential increase in flood peaks must be mitigated to at least predevelopment levels by the provision of adequate stormwater detention facilities at micro and macro levels.

- The potential increase in flood volumes must be mitigated where possible by subsoil infiltration, retention of runoff in on-site facilities for irrigation use and unsaturated wetland areas where evaporation and infiltration can help to reduce flood runoff rates.

5 IMPACTS OF THE RUNOFF FROM THE PROPOSED SIBAYA PRECINCT ON THE MHLANGA ESTUARY

This assessment has been undertaken in two parts. The first considers the worst case (unmitigated) scenario where there is no mitigation of the runoff from the proposed development. The second scenario considered is that under conditions where the proposed mitigation measures (Sagen Projects, 2007) have been successfully implemented.

5.1 *Worst case scenario*

In the worst case scenario, the development would result in an additional inflow of 6.19Ml/day (1.44 + 4.75Ml/day) to the estuary. This would result in the estuary mouth breaching far more frequently than is currently the case. Lawrie (2007) found that, if the Mhlanga estuary experienced no treated sewage discharge from the Mhlanga and Phoenix Waste Water Treatment Works, the mouth of the estuary would remain closed to the sea approximately 91% of the time. The current scenario, however, is that the estuary mouth is closed to the sea only 68% of the time. The additional runoff from the Sibaya Precinct would constitute an increase of approximately equivalent to that of another Mhlanga WWTW (currently discharging 6.5 Ml/day into the estuary (Lawrie, 2007)). Stretch and Zietsman (2004) found that the actual outflow from the Mhlanga WWTW varied from 1 to 20 Ml/day during the course of a day.

The increased inflow into the estuary would result in a significant increase in the frequency, and duration, of the periods when the estuary was open to the sea. This would have significant ecological impacts on the estuary.

5.2 *Assessment assuming successful implementation of the stormwater management plan*

Sagen Projects (2007) conclude that the implementation of the stormwater management plan would successfully mitigate against any significant increase in

runoff from the site. As such, under such conditions, the impacts on the estuary would be considered insignificant.

6 CONCLUSION AND RECOMMENDATION

The successful implementation of the stormwater management plan would successfully mitigate against any impact of surface water runoff from the development impacting on the estuary.

To minimise the risks to the estuary it is recommended that the stormwater management plan be implemented, specifically those components relating to the infrastructural components and the rehabilitation of the wetlands, prior to the commencement of any site development.

7 REFERENCES

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