

CONCEPT FOR TESTING MODERN WASTEWATER TECHNOLOGIES IN THE EERSTE RIVER CATCHMENT

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The Eerste River catchment in the Western Cape province at the southern tip of South Africa was selected as an appropriate area for testing new wastewater technology concepts. The catchment with a range of 420 km² features the typical characteristics representative for other catchments in the country. The most important fresh water resource of this study area is the Eerste River and its tributaries. The river system consists of a manageable number of tributaries, so the monitoring of the waterbodies can be carried out in a short amount of time. Imbalances based on unrequested wastewater discharges are getting noticed and the discharger can be identified quite fast.

The town of Stellenbosch, including the bordering communities and the vineyards and orchards surrounding the urban area, is the most important settlement located inside the catchment area. Similar to most European developed countries Stellenbosch offers a fairly high living standard. The surrounding tourist and wine region is characterized by a low mountain range and the local vineyards. Informal settlements such as Kayamandi and Jamestown are an exception to that standard of living. Both have been integrated as a part of the town of Stellenbosch but are also the historical "Townships" of this area.

The improper wastewater and faecal disposal of the informal settlements causes both direct contamination of the river system by the emptying of chamber pots and an indirect one caused by runoff following rain events. This leads to a significant pollution level of the river system.

In addition to the high bacterial count mentioned above, the predominant agricultural imprint of this catchment area and its related cultivation results in pesticide and nutrient runoffs. Appropriate monitoring programs for assessing the situation concerning the actual environmental load and for the continuous controlling of the state of water quality have not yet been established in this

catchment area. Referring to this, a call for action was confirmed from the decision makers of this region.

In the context of the present study intensive discussions have already been carried out with the local decision makers. The following guidelines for an integrated water resources management plan have been developed:

- [1] Provision of an adequate and safe freshwater supply in urban and rural areas with simultaneous consideration to sustained utilisation of the water
- [2] Provision of an appropriate capacity for the treatment of wastewater both in rural and in urban areas
- [3] Construction of an efficient and sustainable wastewater network
- [4] Development of hygienic and safe sanitation systems and waste disposal practices for the informal settlements
- [5] Adaptation of the capacity of the staff in the service areas
- [6] Monitoring of the water quality of all water sources

Especially in the strategic field and in purposes of the implementation of new technology, a bilateral cooperation between local and German scientists is beneficial for both parties. This applies in particular to the following issues:

- Design of a water quality monitoring system in regards to relevant hazardous substances and pathogens
- “Screening”: measurement of water-relevant substances in the influent and effluent of the central wastewater treatment plant (WWTP) in Stellenbosch
- Development of an appropriate chemical analysis program
- Concept for an improvement of the wastewater situation in Kayamandi; this can be realized by innovative sanitation concepts and appropriate treatment processes including the related knowledge transfer
- Design, building and operation of a transportable WWTP

The existing know-how both in the scientific and the economic field can be communicated by a bilateral network of experts.