



## Project Sheet

### Water Resources Studies carried out in the Mhlathuze River Catchment

**LOCATION:** Mhlathuze River Catchment, ±200 km north of Durban, South Africa

**CLIENT:** Department of Water Affairs and Forestry, Mthlathuze Water

**STATUS:** This sheet describes three separate studies:

- Mhlathuze Operating Rules and Future Phasing (MORFP), 1998 - 2000
- Mhlathuze River System Planning Analysis (MPA): 2004 Update, 2004
- Mhlathuze Water Availability Assessment Study (MWAAS), 2005 - 2008

**OBJECTIVE:** MORFP: The study followed on from a number of earlier investigations and was commissioned by the Department of Water Affairs and Forestry, Directorate: Project Planning and Mhlathuze Water to assess the current and possible future water resources situation in the Mhlathuze River System.

MPA: The objectives of this study were to revise the projected water requirements of the Mhlathuze River System and to update the Planning Model in order to review the water resources augmentation requirements of the system and the annual operating rule of the system.

MWAAS: The Department of Water Affairs and Forestry, Directorate: National Water Resource Planning (NWRP) has commissioned five studies on the Mhlathuze, Inkomati, Berg, Crocodile (West) and Olifants River Systems, for the purpose of assessing the available water resources in support of the process to license water use. These studies, which are referred to as Water Availability Assessment (WAA) studies, are in support of the Water use licensing process and focus on the technical water resource analysis assessment of the indicated river systems. The MWAAS study area includes the Mhlathuze, Amatikulu and Mlalazi river systems.

**CHALLENGE:** This area is largely over allocated considering the water resources available. The reason it has remained in balance is that some users are not fully utilizing their allocations. This could, however, change at any time into the future, and it is therefore necessary to manage the system correctly.

#### DESCRIPTION

MORFP: The Study involved the updating and extension of the hydrology for the entire Mhlathuze River catchment, over the period 1920 to 1994 (hydrological years). Furthermore, water demand projections were updated for existing and possible future users in the system. The Water Resources Yield Model (WRYM) and Water Resources Planning Model (WRPM) were also configured to develop system operating rules and to schedule the implementation of proposed augmentation schemes.

MPA: A significant amount of effort was spent in this study to discuss future demands with the users. These demands were input into the Water Resources Planning Model. A number of scenarios were then carried out considering various augmentation options.

MWAAS: The MWAAS study carried out a number of tasks. The hydrology of the study area was redone. Updated water requirements and return flows were determined. A significant amount of work was carried out to obtain accurate landuse information. The MWAAS study also focused on groundwater use and wetlands in the study area.

#### RESULTS

- MORFP: Results from the Study showed that the Mhlathuze River system was in an extremely stressed state and that drastic water conservation and demand management measures would have to be implemented in order to avoid the need for immediate augmentation. Furthermore, detailed descriptions were provided of appropriate operating rules for Goedertrouw Dam, the lakes in the Mhlathuze River system, as well as for the Thukela-Mhlathuze transfer scheme.
- MPA: If the low demand projection is realized in the system, there will be no risk of curtailments to the water supply in the short term and no intervention to the system will be required during the simulation period. If the high demand projection is realized there is an increasing risk of curtailments to the water supply from 2006 until 2014 when intervention such as water resources development or water conservation measures will be required.
- MWAAS: The final deliverable of the MWAAS study was a WRYM configuration which can be used in future to support license applications. A number of new features were built into the WRYM and these were populated in this study. Only a base scenario simulation was carried out for this study and the intention is that a new study be undertaken in order to carry out additional scenario analyses.



