



water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Directorate: National Water Resource Planning

STRATEGY STEERING COMMITTEE OF THE VAAL RIVER SYSTEM RECONCILIATION SCENARIOS - PROGRESS REPORT Meeting 5 - October 2011

The system water balance and reconciliation scenarios are constantly being revised as information changes regarding water use and return flows; revised water requirement and return flow scenarios; possible transfers to the Crocodile West River System, mine effluent management scenarios as well as the eradication of unlawful irrigation water use.

Revised water requirement scenarios were received from Eskom, Sasol, MidVaal Water, Sedibeng Water as well as from the All Town Reconciliation Strategy Study. This is summarised in **Figure 1** showing the following:

- The dotted lines represent the scenarios applied for the water balances presented at the October 2010 and April 2011 SSC meetings and the solid lines the revised scenarios.
- The three sets of scenarios are:
 1. High water requirement scenarios derived from a high population growth scenario accounting for migration patterns driven by socio economic conditions.
 2. The “High with Eradication of Unlawful Water Use” scenarios represent the case where 85% of the perceived unlawful irrigation water use is removed.
 3. In addition to item 2 above, the third scenario, “High Water Requirement Scenario with Water Conservation and Water Demand Management” incorporate the potential savings that need to be achieved through the implementation of Project 15%.
- All scenarios show lower water requirements which reflect the reductions in the revised projection scenarios received from Eskom (lower projected water use over the period up to the year 2018), Sasol (lower for both the Secunda and Sasolburg plants), Sedibeng Water as well as Mittal Steel.
- It should be noted that although the water requirement scenario received from Eskom indicated a substantial reduction in water need after the year 2020, the assumption was made in **Figure 1** that the water demand remain constant at the 2020 level. This represents a conservative approach and makes provision for the uncertainties relating to the possible long term future need for water from the Crocodile West or Olifants River Systems.
- The purple and blue solid lines indicate distinct reductions in water requirements until the year 2014, which reflect the respective savings to be achieved by the eradication of the unlawful irrigation water use and the implementation of water conservation and water demand management measures.

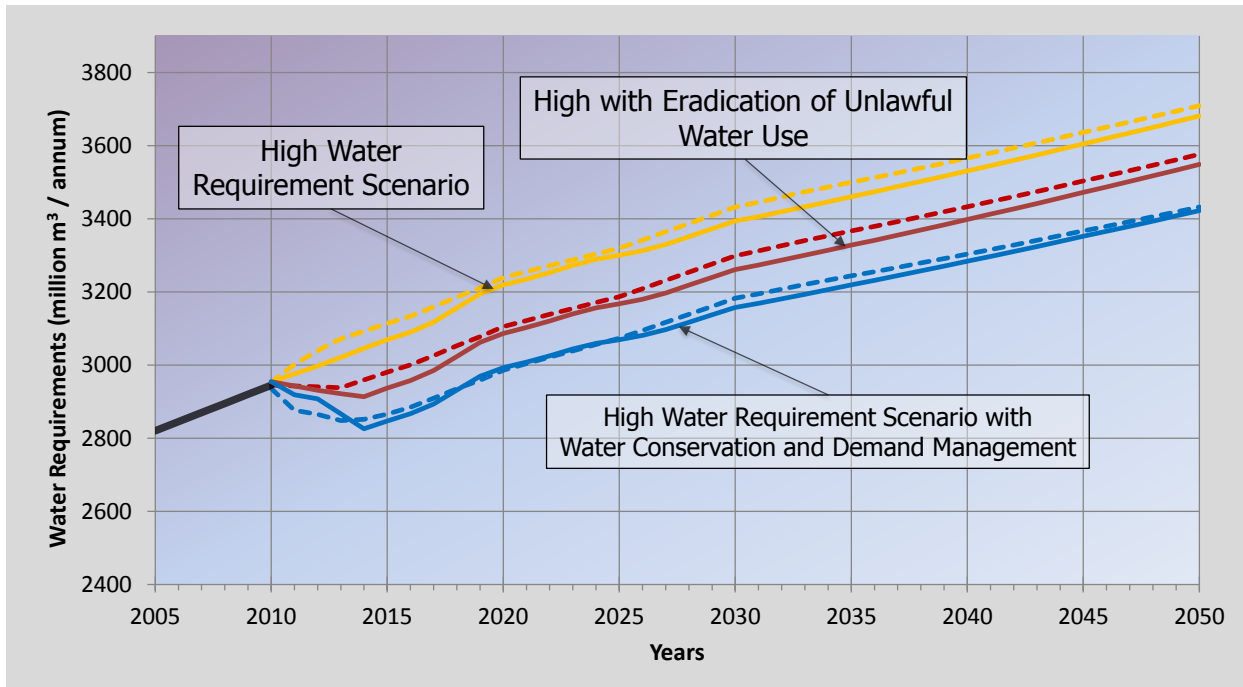


Figure 1: Net System Water Requirement Scenarios (dotted lines – April 2010 scenarios, solid lines revised scenarios October 2011)

The outcome of the target reconciliation scenario is presented in **Figure 2** which shows that a positive water balance can be maintained until the year 2050 if all the strategy actions are implemented.

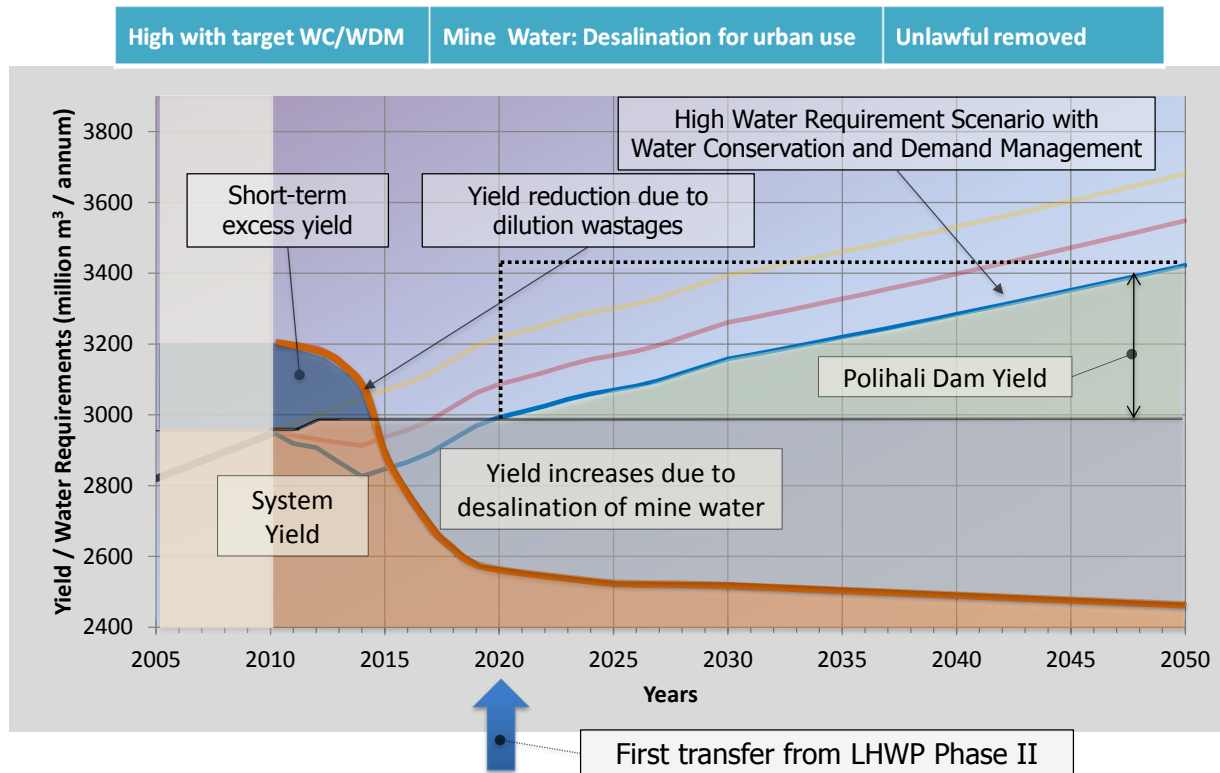


Figure 2: System water balance and target reconciliation scenario

Notes on Figure 2

- Due to the high levels of the dams (May 2011) the system balance shows a short term excess for the first few years.
- The discharge of high salinity mine water will increase once the underground compartments filled and this will require large volumes of releases from Vaal Dam for dilution, which reduces the system yield due to excessive spills and wastage from Bloemhof Dam.
- Desalination and use of the mine effluent prevent these wastages and the system yield increases to about 3 000 million m³/annum by the year 2014.
- The eradication of unlawful irrigation water use by 2013 and the savings through WC/WDM will maintain a positive water balance until the year 2020.
- The implementation of Phase II of the LHWP (Polihali Dam and conveyance infrastructure) by 2020 will ensure sufficient water is available until the year 2049.
- The full yield of LHWP Phase 2 can only be transferred to the VRS if a yield replacement scheme is developed in the Orange River catchment and commissioned by the year 2034.

Reconciliation Perspectives:

- Sufficient water can be made available to all users in the Vaal River System only if all the interventions reflected in **Figure 2** are successful implemented.
- Although there are currently sufficient water for supply in the short term (due to full dams), extended delays in achieving the target water saving will increase the risk of water restrictions over the long term and jeopardise sustainable supply until Phase II of the LHWP can deliver water.

- At the recently held SSC for the Crocodile West River System it was indicated that there are several bulk water supply project proposals from local authorities and water service providers to utilise the surplus water in that catchment. In addition augmentation to the Lephalale area is needed from the Crocodile West River System and the water balances indicated there is insufficient surplus water to supply all the proposed bulk abstraction projects. It was therefore recommended to prioritise the bulk abstraction projects before further water use licenses are approved.

The outcomes of this prioritisation exercise will most likely influence the water balance of the Vaal River System and continuous coordination of both SSCs are essential.
