

Leakage reduction in primary schools

Upington, South Africa

water scarcity impact

Reduced withdrawal	●
Reduced consumption	●
Improved water quality	●
Increased productivity	●
Net basin benefit	●

volumetric impact
19 000 m³/yr

capital cost
\$4 092

estimated unit cost of water
<5 ¢/m³

Water Stress
South Africa ○

Arid & low water use
 Low (<10%)
 Low to med (10-20%)
 Med to high (20-40%)
 High (40-80%)
 Extremely high (>80%)
 No data available

Water Stress Map:
Gassert, F., M. Landis, M. Luck, P. Reig, and T. Shiao. 2013. "Aquaduct Global Maps 2.0."

Confidence level
● Low ● Medium ● High

Water Scarcity Impact Key
● Main ● Minor

Credits
 We wish to acknowledge the input and support of Khara Hais Municipality in the preparation of this case study.

Project Overview

This project was undertaken to reduce unacceptable levels of leakage at the Keidebees and Vele Langa Primary Schools in Upington. The cost of the benefits were documented so that the process could serve as a model for other schools and public buildings. The need was identified during an inspection of plumbing fittings for visual leakage in public buildings in and around the town and further underlined by an examination of consumption levels and water bills being paid by schools.

The significance of the project is in its simplicity and cost-effectiveness since it can be easily replicated at thousands of other schools and public buildings leading to huge water savings. More significantly, much of the "wasted" water that is targeted by this type of project would otherwise be lost to evaporation and evapotranspiration rather than making its way back to the resource base via return flows or groundwater recharge. The project showed how carefully planned and properly implemented interventions can lead to tangible and significant results in a short period of time. The resultant water savings paid for the investment made within six months.

Key Elements

- Situational analysis through the replacement of both of the existing water meters at the school with loggable consumer meters.
- Identification of all visible leaks around the school buildings through inspection of all fittings.
- Repair of leaking fittings.
- Analysis of outcomes through continuous monitoring and simple cost-benefit analysis.
- Financed by a grant from the Department of Water Affairs.

Key Outcomes

- Immediate water savings in the order of 50m³/day between the two schools.
- Average water bills at the schools were more than halved and the financial savings would have paid for the interventions within six months.
- Students were exposed to the importance of water conservation during an education and awareness building session that was included as part of the project.
- A carefully and accurately monitored example quantifying savings for replication by other schools and public buildings.



Upington, South Africa

Intervention Features

- Municipal leakage detection and repair

Project Levers

(1) Logging of flows for situational analysis, before during and after:

The first step involved installing loggable meters at the Keidebees and Vela-Langa primary schools. Loggers were installed on the new meters to monitor the consumption patterns at the schools prior, during and after the leak repair exercise. Flows in m³/hr were monitored for one week before carrying out the required repairs. Most significantly, the average minimum night flows were measured at 2.1m³/hr and 1.1m³/hr at the two schools, indicating that leakage rates were excessively high. After the repairs the average minimum night flows were reduced to 0.7m³/hr and 0.4m³/hr respectively.

(2) Visual inspection:

During the first week of monitoring the visual inspection of all fittings was carried out and local plumbers were requested to provide quotations for repairs and the replacement of faulty fittings. Four outside underground leaks were identified.

(3) Repair of leaking fittings:

The repairs and replacements carried out at the two schools included the fitting of 14 new flushing mechanisms; 19 new taps and the replacement of the urinal flushing systems with timed push button systems. The four outside leaks were repaired. The repair work was all straightforward and was completed within three days.

Outcomes and Challenges

Unacceptably high water losses at both schools were cut to about a third of their original values through a number of simple and inexpensive plumbing interventions including both pipe repairs and the replacement of faulty or broken fittings. Equally important as the actual water savings was the fact that the whole process was carefully measured so that both the water and financial savings could be clearly demonstrated providing an ideal platform for replicating the project at other schools and public buildings. The fact that the schools were chosen as the vehicle for the pilot study is significant because it also provided the opportunity to create awareness at an early age and for students to take the water conservation and demand management message home.

Despite the obvious success of the project the main challenge lies in getting it replicated elsewhere in the region and ultimately country-wide.



Above: Installation of a loggable consumer meter (© WRP (pty) Ltd.)

