



## SANCID WATSAVE NOMINATION

# Water distribution management at the Vaalharts irrigation scheme

### The innovation

The innovation is to supply the correct amount of water to the right place at the right time with the minimum water loss within the limitations of the Vaalharts irrigation scheme system. That is done by the implementation of a Water Administration System (WAS).

At Vaalharts Water this can be a very daunting task given the size of the scheme and the number of farmers that require water on a weekly basis. To assist them in this task and to improve on their service delivery to the irrigation farming community they have agreed to replace their manual water distribution system with a computerised system called the Water Administration System (WAS).



Equally important is to inspect and maintain the canal network to prevent excessive water losses due to bad maintenance.

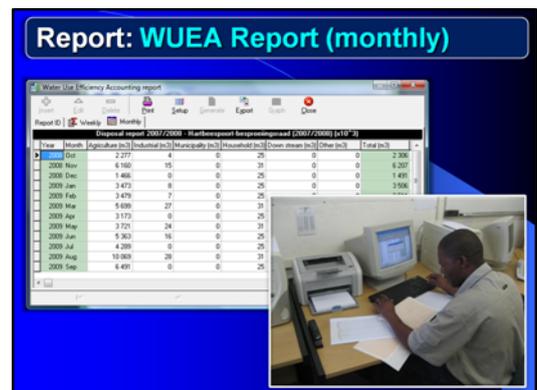
### Saving of water through the innovation

With the implementation of the WAS program, Vaalharts Water managed to decrease the losses from 32% to 26.7%. A 5% saving, which is equivalent to 17.5 million m<sup>3</sup>, was therefore realised in the first year after implementing the WAS program at Vaalharts Water. This saving is the equivalent of:

- An additional 1920 ha that can be irrigated, given the fact that the full water quota at Vaalharts Water is 9140 m<sup>3</sup>/ha.
- Alternatively 74 additional farms of 25.7 ha in size, could be irrigated with the water saved.

### Introducing the innovation

The Vaalharts irrigation scheme is situated at the confluence of the Harts and Vaal rivers on the border between North West and the Northern Cape provinces in South Africa. The Vaalharts Water User Association (Vaalharts Water) took over the government scheme in 2003. It is the largest irrigation scheme in the country, with a scheduled area of 29 181 ha. The scheme consists of a network of canals covering a distance of more than 100km supplying water to ± 1 873 abstraction points through pressure regulating sluices. The water source is the Warrenton weir with a capacity of 48.663x10<sup>6</sup> m<sup>3</sup> which is situated in the Vaal River. The capacity of the main canal feeding into the Vaalharts Water canal network is 38.3m<sup>3</sup>/s.



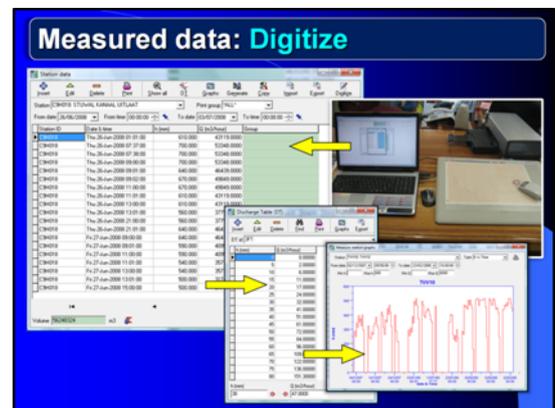
The weekly water distribution management practices at Vaalharts Water are very labour-intensive and it is difficult to prevent water losses consistently week after week and still maintain a good relationship with the farmers. The previous hand water distribution system based on a weekly water ordering system is a proven system that has been developed over a long period of time. It, however, contains certain limitations that cause excessive water losses that are difficult to prevent. The most important limitations of the manual system can be summarized as follows:

- A number of people are involved in the calculations and calculation errors commonly occur.
- Losses are unknown factors which are estimated most of the time.
- Measuring station data are processed manually and the quantifying of released volumes from chart recorders are inaccurate. This results in inaccurate release calculations and water reporting figures.
- The system is slow and inefficient when water distribution sheets need to be recalculated due to changes in demand.
- Personnel changes have a negative effect on water distribution management due to information and experience being lost.
- The compiling of water use efficiency reports are time consuming and not very accurate.



The computerised system in the form of the Water Administration System (WAS) was introduced to address the above-mentioned problems of the hand water distribution system and improved the operations at Vaalharts Water in the following ways:

- Water orders are captured directly into the computer by water control officers.
- Calculation errors are eliminated because the computer does all the calculations.
- Water balances are updated on a daily basis.
- A digitizing tablet was purchased which is currently used to digitize and import measuring station data from measuring stations that still use chart recorders. This method proved to be so fast and accurate that all the old data was deleted and re-done electronically using the digitizing tablet. Volumes are now quantified on a weekly basis and not monthly as it were done in the past.
- Water distribution sheets can now quickly be recalculated in cases of water order changes. The water distribution sheets are also linked to a variable water loss percentage per canal which was impossible with the manual system.
- Water use efficiency reports are now generated automatically with the WAS. All that is required is that the water orders are captured and that the measuring station data is either digitized or electronically imported into the computer.
- All water control officers are computer literate due to the user friendliness of the WAS. A total of eight computers are used on a network for WAS at Vaalharts Water.
- Minimum paperwork is needed and all the water reports are generated electronically.
- Water shortages on canals due to human error are limited.
- Canal leakages and breakages can easily be monitored due to fixed water losses.
- Water control officers have more time for inspections, minor repairs and time for clients.
- The water control office gets more complements for good service delivery which makes them positive and proud to work for Vaalharts Water.
- Productivity has vastly improved and water reports can be trusted. The attitude of water control officers are much more positive because their admin work is much less and they can spend much more time outside on the scheme.
- Water loss on the scheme was decreased by 5% from 32% to 26.7% in a single year.



### **Scope for further expansion of the innovation**

The implementation of the WAS program makes the water savings at Vaalharts Water sustainable with the potential to improve even more in the future. As the proficiency and knowledge of the personnel increase with WAS the accuracy of supplying the correct amount of water to the right place at the right time improved and more savings are expected. Due to the fact that the Vaalharts irrigation scheme and the close by Taung scheme are interlinked, the innovation will also be introduced to the Taung scheme under the guidance and supervision of the nominee.

### **Role of the nominee**

The nominee's foresight by implementing the innovation at Vaalharts irrigation scheme is commendable. Due to his intervention water losses was decreased, water was made available more accurately and the farming community reaped the benefits. The personnel of the water distribution management office at Vaalharts Water have proven what can be done with dedication and perseverance.