



Water Administration System



Figure 1.1: WAS main screen

Introduction

The Water Administration System (WAS) is an integrated management tool for irrigation schemes that delivers water on demand through canal networks, pipelines and rivers. WAS is used for water distribution management and for the calculation of canal and dam operating procedures for a given downstream demand.

WAS uses an open source database called Firebird (SQL-based) as the underlying database. Firebird is a relational database management system (RDBMS) that provides rapid transaction processing and data sharing in a single- or multi-user environment.

The WAS program is currently in use at all the major irrigation schemes and a number of smaller irrigation boards throughout South Africa.

Application areas

WAS is an integrated database driven system with many water management capabilities. WAS can be implemented in a small water office that manages a few abstractions and measuring stations up to a CMA level that manages thousands of abstractions and measuring stations. WAS is used for the efficient administration of:

- Address information.

- Scheduled areas.
- Water quota allocations.
- Water delivered through pressure-regulated sluice gates, measuring structures and water meters.
- Water distribution sheets.
- Water use efficiency accounting reports.
- Water transfers between users (automatic and manually).
- Water use calculations for planted areas based on crop water use data.
- Date and time related flow data collected from electronic loggers or mechanical chart recorders.
- Discharge tables (DT) to do conversions between water depth and flow rate for measuring structures or vice versa.
- List of rateable areas (LRA) information.
- Calculation of scheme water balances.
- Dam information time series including dam levels, dam capacities, dam surface areas, dam spilling, rainfall, evaporation, inflows and outflows.
- Calculation of water releases for water distribution through canal networks, pipelines and rivers taking lag times, evaporation and seepage into account.
- Billing system that links to water use information.
- E-mail invoices in pdf format.
- Flexible tariff sets based on water usage, a flat rate or scheduled area.
- Images and photos that can be linked to different types of information in the database.
- Bulk SMS system.

Sun		Mon		Tue		Wed		Thu		Fri		Sat		Sun		Totals	
D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N		
		A	A	A	A	A	A	A	A	A	A					18000	m3
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	120	hours

Benefits

The WAS program saves all information in a Firebird (SQL) database that can be installed on a single PC or on a server for use over a network. This makes it possible for the manager, accounts personnel and water office personnel to access the database from PC's in their own offices. There is no limitation on the number of PC's that can be linked to the database.

What makes the WAS program unique is the fact that it is an integrated system that includes the water allocations, water use, water distribution, water measurement, crop water use, billing information and a bulk SMS system. WAS will generate monthly invoices automatically using water usage or scheduled areas information captured in the database.

Different user names and passwords can be used to control access to certain information in the database. The main benefits of using the WAS information system is as follows:

- Minimising of water distribution losses.
- Improved control of water orders, releases, distribution and usage per farmer.
- Management of date and time related flow data collected from electronic loggers or mechanical chart recorders.
- Availability of an extensive list of water reports on a farm and scheme level.
- Increased productivity of scheme management personnel.
- Reliance on an integrated accounting system that improves debit management.
- Improvement of the overall water management on irrigation schemes.

Water savings

Many years of research went into the development of the WAS program with its main aim to minimize water losses on irrigation schemes. Field

measurements indicated water savings between 10 to 20% on implementing the water release module of the WAS program alone.

The different modules of the WAS program can be implemented partially or as a whole, depending on the requirements of a specific scheme. It makes therefore sense to implement the modules that makes the biggest difference first.

It is also important to emphasize that a computerised water management system like the WAS program prevents human errors that can lead to potentially huge water losses. Feedback from WAS users at training courses indicates that after converting, it is considered impossible to manage irrigation schemes without the use of the WAS program.