



**How Wonderware Software Addresses  
the Top Challenges of the Municipal  
Water and Wastewater Business**

*Steve Garbrecht, Director of Product Marketing*

## **Introduction**

Since 2004, the American Water Works Association (AWWA) (<http://www.awwa.org>) has conducted the State of the Industry survey to take the pulse of the water industry in North America, compiling detailed and comprehensive data about critical issues and concerns. The recent AWWA report based on this survey identifies the most critical issues that AWWA members see today in the operation of water and wastewater systems. This document lists the top five issues in order of importance and explains how Wonderware software addresses them.

Wonderware provides software to help municipal and industrial operations run more efficiently and at lower costs. While it can't solve all of the problems the industry is facing, such as finding new sources of water, it can be of great benefit in assisting with the major concerns in the industry.

## **The Water and Wastewater Business**

The water and wastewater business is like no other industrial operation. It is typically funded by government resources, which means the development of water systems across the world is dependent upon population growth and the ability for a municipality to pay (a factor of Gross Domestic Product [GDP] per capita). Because of this, much of the development has been confined to North America and Western Europe. But with the emergence of a worldwide economy, many emerging countries are putting in formal water treatment, distribution and waste management systems.

The only exception to this rule is industrial water and wastewater treatment facilities used for manufacturing, power generation and other processes such as oil refining. These users are faced with keeping tighter control of operating costs and the ever-escalating requirements for compliance and regulatory reporting.

## **Issue #1 - Regulatory Factors**

Wonderware software ensures that the critical data required to generate the necessary regulatory reporting is collected and stored -- regardless of local networking issues. Wonderware has developed its revolutionary System Platform 3.0 software so that, in the event of a network or server failure, the data is stored locally and then forwarded to the Wonderware Historian when the problems have been corrected. Loss of historical data is not readily accepted by regulatory agencies, so Wonderware software helps protect the water/wastewater operator from the potential fines and penalties that data loss may generate.

*How Wonderware Software Addresses the Top Challenges of the  
Municipal Water and Wastewater Business*

Wonderware software is also built with the ability to easily extract data from control devices and systems and then transform this data into meaningful information. This new information is assembled into reports using Microsoft® tools such as Excel®, Word or SharePoint® Web reports. Wonderware software is completely open, enabling the extraction of information using open interfaces such as SQL (Structured Query Language). . These reports are completely customizable to meet any regulatory agency's format or delivery method, and reports can be automatically scheduled and uploaded at a regular frequency. Wonderware software also provides a long-term data archive that can be used to create reports in the future.

## **Issue #2 - Business Factors**

On one hand, the financing of repairs, replacements, upgrades and new water systems is becoming a key concern. On the other hand, water districts and municipalities face severe limitations on rate increases. This is further exemplified by the growing imbalance between the cost of operations versus the rates customers pay for water and wastewater services.

Water system operators can choose to pass these rising costs on to consumers, which can typically carry unfavorable political implications, or they can find ways to reduce operating costs to remain more competitive. Included in these costs is the engineering and maintenance of the SCADA/HMI system, which must be modified continually to include new infrastructure changes. Wonderware software enables customers to develop “standardized” engineering and graphics that can be utilized again and again without the need for re-development, saving countless hours of engineering time and associated costs. By utilizing these software standards within their operations, customers have discovered many ways to reduce costs and improve operational effectiveness.

## **Issue #3 - Source Water Supply**

With growing populations and demand across the world, new sources of water are harder to come by, and in many cases existing ground water is being depleted, creating continued long-term water shortages. At the same time, protecting existing source water is coming to the forefront.

In many regions and municipalities, water operators are required to report the amount of water put into the system versus the amount of water returned for treatment. This report identifies water loss through leaking mains and is often part of evaluating which infrastructure improvements must be undertaken. Wonderware software is designed to monitor process variables in real time so operators can easily determine (through both live and historical data) where they are experiencing water loss – right to the particular main that is causing the problem.

While Wonderware can't make water appear where there is none today, it can help conserve water resources and support the utilization of new resources. This includes assisting with the control and automation of new technologies, such as desalinization and expanded reclamation and treatment facilities. Wonderware software is recognized by system integrators as a powerful technology platform for automation and information applications. Because of its flexibility, Wonderware software can be molded into any type of application. Also, communicating with any automation system, database or business system is no problem with Wonderware software.

#### **Issue #4 - Aging and Failing Infrastructure**

Water systems in many larger cities are getting older and beginning to fail. A sub-component of this aging infrastructure is the SCADA system installed during the 1980s and 1990s when the advent of Programmable Logic Controllers (PLCs) and lower-priced HMI software became viable for water system operations. These systems may not be failing, but are becoming less valuable as the industry faces increased operational monitoring and business integration requirements.

Wonderware software provides an alternative for augmenting existing automation systems which does not require wholesale replacement of aging equipment. Wonderware software can be cost-effectively installed on top of existing PLCs and HMI products to modernize operation management systems, providing advanced visualization of process information, remote monitoring, easy reporting, alarm detection and incidence avoidance.

#### **Issue #5 – Workforce-Related Factors**

It is estimated that in the next 10 years, 40% of the qualified workers in the water industry will retire, leaving the industry with a severe shortage of operating experience. This results in the need to create a higher level of prestige to attract new personnel, while at the same time controlling salary and training costs. Also, when the post-war baby boomer generation workforce leaves, their combined industry knowledge and operations expertise will be lost.

Wonderware has designed its software to enable customers to develop standards for both engineering and operations so that each application looks the same and -- more importantly -- is operationally the same. This is critical when faced with training new operations personnel. With Wonderware software, the operator only needs to learn how the system works at one facility, and then they know how the application works across all facilities, reducing the cost and time required for training.

Wonderware software is extremely powerful yet very easy to use. Operations personnel can easily and remotely control and monitor the status of operational assets and equipment utilizing standard displays. By creating an environment that is advanced and easy to work in, new employees are more satisfied with their jobs, leading to improved morale and retention. Furthermore, best practices for existing operations can be captured and enforced before knowledgeable employees exit the workforce. In this way, operations standards can be maintained without adding skilled personnel.

### **Key Performance Indicators (KPI) are Important for Operations Management**

In addition to the top concerns identified in the AWWA State of the Industry Survey, the American Water Works Association recommends implementation of 22 specific KPIs so water and wastewater utilities can gauge their operations as well as compare them to those of others.

Wonderware software easily calculates KPIs based on historical or real-time data coming from any data source. This makes it easy to set up and measure business operations effectiveness.

In their "QualServe Performance Indicators Report," the American Water Works Association Research Foundation (AWWARF) identified and defined 22 key benchmarks in five areas of water and wastewater utility operation:

- Organizational Development
- Customer Relations
- Business Operations
- Water Operations
- Wastewater Operations

Of these areas, Wonderware software can assist in the water operations and wastewater operations categories. Following are the KPIs included in those areas:

## WATER OPERATIONS

<b>KPI</b>	<b>How Wonderware Software Helps</b>
<p><b>Drinking Water Compliance Rate</b> Percentage of days in the year during which a utility was in full compliance with the maximum contaminant levels and treatment techniques mandated by the US National Primary Drinking Water Regulations.</p>	<p>Wonderware software can store a long term history of contaminate levels measured by process instruments and lab test systems. This information can be displayed on web-based dashboards.</p>
<p><b>Water Distribution System Integrity</b> Condition of the water distribution system based on the number of breaks and leaks requiring repair per 100 miles of distribution piping.</p>	<p>Wonderware SCADA software can monitor pressure readings across a distribution network, and provide alarms based on any variation. This data can also be stored and displayed on web-based dashboards.</p>
<p><b>Distribution System Water Loss</b> Percentage of drinking water placed into distribution that does not find its way to customers or other authorized users.</p>	<p>Wonderware software can monitor and store meter values, and totalize and account for water input and total output. This can be reported on at any interval necessary.</p>
<p><b>Operations and Maintenance Cost Ratios</b> Cost of operations and maintenance per account and per millions of gallons produced.</p>	<p>Wonderware software can interface to maintenance management and work order systems to combine this information with real-time water usage. This data can be combined, stored and reported as a KPI.</p>
<p><b>Planned Maintenance Ratio</b> Measures how effectively utilities are investing in planned maintenance. Two proposed ratios make comparisons to cost and hours invested in maintenance activities.</p>	<p>Wonderware software can interface to maintenance management and work order systems to combine this information with real-time water usage. This data can be combined, stored and reported as a KPI.</p>

## WASTEWATER OPERATIONS

KPI	How Wonderware Software Helps
<p><b>Sewer Overflow Rate</b> Measures the condition of the sewerage collection system and the effectiveness of maintenance activities. It is expressed as the ratio of the number of overflows per 100 miles of collection piping.</p>	<p>Wonderware software can log operations activities and events, including abnormal incidences such as overflows. This information can be combined with static information such as collection piping lengths and reported as a KPI.</p>
<p><b>Collection System Integrity</b> Measures the frequency of collection system failures per 100 miles of piping.</p>	<p>Wonderware software can log operations activities and events, including abnormal incidences such as collection system failures. This information can be combined with static information such as collection piping lengths and reported as a KPI.</p>
<p><b>Wastewater Treatment Effectiveness Rate</b> Quantifies a utility's compliance with the effluent quality standards in effect at each of its wastewater treatment facilities.</p>	<p>Wonderware software can monitor a distributed network of treatment facilities and combines information to give custom views of quality measurements and compliance levels. When a facility is out of compliance, an alarm can be reported to operations managers.</p>
<p><b>Operations and Maintenance Cost Ratio</b> Cost of operations and maintenance on a per account and per millions of gallons basis for wastewater processed.</p>	<p>Wonderware software can interface with any software application or database. If the municipality's accounting package can expose financial data, it can be combined with operations data, including water usage. This can be reported as a KPI.</p>
<p><b>Planned Maintenance Ratio</b> Measures how effectively utilities are investing in planned maintenance. Two ratios make comparisons to cost and hours invested in maintenance activities.</p>	<p>Wonderware software can interface to maintenance management and work order systems to combine this information with real-time water usage. This data can be combined, stored and reported as a KPI.</p>

The complete list of 22 KPIs can be accessed at:

<http://www.awwa.org/Resources/utilitymanage.cfm?ItemNumber=630&navItemNumber=1595>

*How Wonderware Software Addresses the Top Challenges of the Municipal Water and Wastewater Business*

## **Conclusion**

Wonderware software is extremely useful for water and wastewater operations. It offers an excellent tool set and enables software system integrators and value-added resellers to build operations management solutions, including HMI, SCADA, information management, application integration and reporting solutions.

With over 20 years of experience in the automation and information software industry, thousands of water and wastewater systems already count on Wonderware software to help solve the industry challenges of today, as well as those of the future.



Contact Wonderware or your local Wonderware Distributor for more information on industrial automation and information solutions.

Wonderware • 26561 Rancho Parkway South, Lake Forest, CA 92630 • Tel: (949) 727-3200 • Fax: (949) 727-3270 • [www.wonderware.com](http://www.wonderware.com)

© 2008 Invensys Systems, Inc. All rights reserved. No part of the material protected by this copyright may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, broadcasting, or by any information storage and retrieval system, without permission in writing from Invensys Systems, Inc.

Invensys, Wonderware, ArcestrA, Factelligence, InTouch, InBatch, InControl, IndustrialSQL Server, InSQL, InTrack, QI Analyst, SCADAAlarm, SuiteLink, SuiteVoyager, WindowMaker, WindowViewer are trademarks and registered trademarks of Invensys plc, its subsidiaries and affiliated companies. All other brands and product names may be the trademarks or service marks of their respective owners.

Part No. 15-0220; 4/08