

Congratulations!!

EEl would like to recognize the following employee for his milestone anniversary with the company:

10 Years: Stephen T. Dennison, P.E.
Project Manager



EEl would like to recognize the following employees for their recent promotions within the company:

Senior Project Manager:
Stephen T. Dennison, P.E.

Project Managers:
Kurtis T. Muth, P.E., LEED AP and
Timothy V. Weidner, P.E.

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Did You Know?

Engineering Enterprises, Inc.'s very own Pete Wallers, P.E., CFM was recently recognized for his 30 years of service with the American Water Works Association (AWWA) and the water industry. To celebrate this accomplishment he received the Silver Water Drop Award. Pete is committed to working towards a sustainable water supply for the people, economy, environment, and future generations.



Enterprises Trivia Challenge

Q: What were the first water pipes in the US made from?

Send your answer to eei@eeiweb.com or fax to (630) 466-6701 by December 31st to be entered in a drawing for a \$50 American Express gift card!



Engineering Enterprises, Inc. (EEI), founded in 1974, provides consulting engineering services throughout northern Illinois. Our expertise includes water, wastewater, transportation, stormwater, construction management, land surveying and GIS.

www.eeiweb.com



52 Wheeler Road
Sugar Grove, Illinois
60554-9595 USA



Water Audits: The Next Generation

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Aging and leaky water distribution system infrastructure combined with on-going water scarcity concerns are changing how water utilities manage their water systems across the world, including Illinois. To effectively manage the water within a distribution system, a utility must first quantify water consumption and losses. A water audit does just that, and it can be defined as:

An accounting practice for any water system to help

Understand water consumption and losses that occur in the distribution system and to

Determine the validity of the utility's data so that an

Implementation plan can be created for reducing non-revenue water while focusing on data validity, then

Tracking and benchmarking a utility's progress

Fall / Winter
2014

Enterprises

Water Audits: The Next Generation, Cont'd.

In August 2014, the American Water Works Association (AWWA) released Version 5 of their free water audit software. This smart Microsoft Excel spreadsheet offers a starting point to track water loss within the distribution system. It is a top-down, or high level, audit form. This software offers a consistent benchmarking tool to compare themselves with other utilities as well as a way to track their own progress through time.

This software is based on best practices identified in the AWWA Manual M36: **Water Audits and Loss Control Programs**. It utilizes the common terminology defined in the manual that allows utilities to speak consistently with other utilities. It dismisses the term "unaccounted for water" because it is imprecise and is not necessarily defined the same way by each utility. "Unaccounted for water" has been replaced by Non-Revenue Water which is defined in the M36 Manual as "the sum of Unbilled Authorized Consumption, Apparent Losses, and Real Losses,"¹ or, "the difference between the System Input Volume and Billed Authorized Consumption."¹

This audit form offers a utility a tool to begin to place their losses into categories. The two major categories of water losses are apparent and real losses. Apparent losses are "unauthorized consumption, all types of customer metering inaccuracies and systematic data handling errors."¹ Real losses are "the annual volumes lost through all types

of leaks, breaks, and overflows on mains, service reservoirs, and service connections, up to the point of customer metering."¹ By completing the water audit form, several operational efficiency and financial performance indicators are calculated and provided to the end user. A common operational efficiency performance indicator that many utilities refer to is the Infrastructure Leakage Index (ILI). This performance factor is focused on real losses, not apparent losses. It is a comparison benchmark for leakage. This score typically ranges from about 1 to 10, and the lower the score, the tighter the distribution system.

From a financial perspective, the annual costs of apparent losses and real losses are calculated. The cost of the apparent losses is based on the retail rate of the water because this is water that would have otherwise been billed (i.e. if a customer water meter is under-registering, then this is water that should have been billed, but was not). The cost of the real losses is based on the operational costs of the system because this is water that would not have been billed, but rather just lost (i.e. water loss during a water main break would not necessarily have been used or billed to any customer, but it did cost the utility money to pump it and possibly treat it). The annual costs for the apparent and real losses combined demonstrate the financial impact that water loss has on the utility.

AWWA's water audit form also calculates a data validity score along with priority areas for attention. These priority areas are focused on improving the integrity of the data that was input into the audit. By concentrating on the accuracy of the water consumption data, effective water loss strategies will emerge and lead to revenue recovery.

A water utility can capitalize on so many of the benefits of the water audit. Reducing water loss can lead to the following:

1. Reduction in operations cost.
2. Reduction in future capital projects and maintenance (i.e. less facilities).
3. Increased revenue to the system.
4. Demonstrating that the utility holds itself accountable to their customers, particularly when requesting rate increases.
5. Good stewardship of a limited resource.



Despite the many benefits, it is still a challenge for many utilities to begin performing the water audit. Two of the common obstacles in performing this AWWA water audit are: 1) Getting started, and 2)

Coordinating between various departments within a utility (i.e. billing operations).

With regard to the first stumbling block, the first time a utility performs an audit, the preparer should understand that the data and the results are not going to be perfect, but over time the data validity score and the overall performance factors will improve. If a utility does not have all of the data available, make assumptions and provide a data validity score accordingly. A utility should not be discouraged by not having all of the necessary data or by their audit results, but rather encouraged to develop an action plan to improve their data validity and accounting for their non-revenue water.

In regard to the second hurdle (Coordinating between various departments), consider setting up a meeting with all key personnel prior to beginning the water audit. At such a meeting, the benefits of the water audit and timely expectations should be outlined. If additional reinforcement is needed to complete the audit, then one should consider overcoming this obstacle by appealing to the supervisor of both the Billing and Operations Departments, i.e., a Village Administrator or City Manager. If the value of the water audit is explained and understood by all, it will be easier to obtain the necessary information to complete the water audit.

Completion of a water audit is the first step in changing the culture of a utility to focus on water efficient practices and holding everyone accountable. Get started and make a difference one audit at a time!



The free Water Audit software and additional resources can be downloaded from AWWA's website: <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>

Please contact **Michele Piotrowski** at mpiotrowski@eeiweb.com or (630) 466-6700 if you have questions or would like additional information regarding water audits.

President's Message



Water and Salt

There is a strong case to be made that deposits of salt and civilization's demand for salt were the basis for our existing road network.

Certainly water, in some form or fashion, is integral to the success of our civilization; alas those individual topics are for another newsletter.

With winter fast approaching I thought it was time we talked about another interesting relationship involving water and salt - road snow and ice control.



We all depend on our roadway network to get us to and from work, run errands, get kids to school and be able to do all the things we want to travel to do. The fact of the matter is that the more salt (chloride) we use for snow and ice control, the more of that material migrates into our water supplies. The U.S. Geological Survey (USGS) has been tracking chloride levels in the shallow groundwater in McHenry County since the 1970's. They have found chloride levels in McHenry County are steadily increasing. After every winter storm the chloride levels in the Fox River and other surface waters in the area soar. The increase in a large part is associated with our demand to have dry pavements as quickly as possible following a snow and/or icing event.

Public Works departments have recognized the water quality threat and have responded by developing different ways of attacking the problem. Many departments work on educating their winter plow crews on best practices for applying road salt, and have developed ways to augment and improve the performance of road salt- such as through the use of beet juice as a prewetting agent. The Public Works folks however can't do it alone and need our help. We have gotten to the point where we demand dry pavement after every winter storm. Would it really be so bad if our local side streets received a little less salt, and we had to drive a little slower because some snow and ice remained?

With all of this in mind, the next time we get a snow storm I suggest you call into your local Public Works Department and ask them to ease up a little on salt on your cul-de-sac. The dead silence and the thud you hear on the other end will be the stunned public works employee fainting. All kidding aside, water is a precious resource and we need to do our part to protect our water supplies - at least think about the opportunities where we can persevere through minor inconveniences for the benefit of maintaining our water supply water quality.



¹AWWA Manual M36: Water Audits & Loss Control Programs