

Nashville Metro Water Services Water Audit using IWA/AWWA methodology

Client: **Metropolitan Government of Nashville and Davidson County**

WSO has carried out eight (8) annual water audits for Nashville's Metro Water Services (MWS), starting in 2003 (for the FY2001-2002) and continuing through 2010 (for the FY2008-2009). Metro Water Services provides water to a population of more than 500,000 through 160,000 service connections. Two water treatment plants operated by MWS produce more than 31,000 million US gallons of water per year which is distributed by 57 pumping stations through 2,700 miles of water main.

Various water audit methodologies have been applied over the years by MWS. The utility has now settled on the International Water Association (IWA) / AWWA recommended water auditing methodologies. WSO have implemented these methodologies since 2003 for MWS and are now in the process of carrying out a third water audit using the same methodology.

During the audit, WSO conducts a review of the current water supply network, which includes an assessment of service coverage, water consumption and demand, metering policies, network losses and maintenance practices. Definitions used in the water audit and the performance indicators that are derived from it, are all based on the published IWA methods.

The water audit quantifies the different components of water losses and is used as the basis for an assessment of the economic level of leakage and the economic level of apparent losses.

The first IWA water audit carried out in 2003 developed the Infrastructural Leakage Index (ILI) and the Economic Level of Leakage (ELL) for the entire MWS system. This was then used to develop a five year plan to reduce the ILI to the economic level.

Each component of the water audit is assigned confidence grades according to a confidence grading scheme. The confidence grades define both the reliability and accuracy of each audit component. This ensures that users of the performance indicators that are developed from the audit data are aware of the reliability of those indicators.

MWS have a long term goal to improve both the accuracy and the reliability of the water audit. Components that have low accuracy or reliability are selected for improved data collection and analysis techniques so that the confidence grade can be improved in subsequent years.

The additional water audits focused on improving the confidence grades associated with apparent losses due to meter inaccuracies. More than 1,500 domestic and commercial customer meters are being tested for accuracy and profiled for 'right-sizing'. This data is also being used to develop a economic change-out program for customer meters.

The 2010 water audit (for FY2008-2009) was used in an attempt to determine the effect the 2010 Nashville flood had on losses and non-revenue water for MWS. A paper for the 2011 DSS is being prepared on that topic.