



Water Loss

Dear Reader:

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We hope this information will be useful to you; reference to it will assist you with many of the questions that will arise in your tenure with municipal government. However, the *Tennessee Code Annotated* and other relevant laws or regulations should always be consulted before any action is taken based upon the contents of this document.

Please feel free to contact us if you have questions or comments regarding this information or any other MTAS website material.

Sincerely,

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Water Loss

Reference Number: MTAS-1388

Water Loss and Infiltration/Inflow

Two areas of concern for water and sewer systems are control of water loss from the water system and infiltration/inflow (I & I) into the sewer system. Water loss can be measured in terms of accounted for losses and unaccounted for losses. Water loss comparisons are made by looking at the reports of actual water treated and pumped into the system by the water plant and comparing them with gallons billed and sold to customers. It is important to understand that every thousand gallons treated and pumped at the water plant costs the water system in labor, chemicals, pumping charges, etc. A certain amount of unmetered water is going to pass through the system each month. Some of that water loss can be identified and accounted for. These accounted for losses are the result of:

- washing filters at the water plant;
- water from fire hydrants used in firefighting;
- tank maintenance; and
- water used in flushing of water lines (especially important to flush dead-end lines).

Effective January 1, 2013 the American Water Works Association (AWWA) water loss methodology must be included in any audited financial statements received by the Comptroller of the Treasury on or after January 1, 2013. The water loss methodology can be obtained from www.AWWA.org [1].

At the June 6, 2012, meeting of the Water and Wastewater Financing Board and the Utility Management Review Board, the following was adopted:

I. Require that the AWWA Excel spreadsheet (in the specific format created by utilizing the AWWA Free Water Audit Software) be submitted electronically in an Excel format. It is the intention of the boards that the AWWA Excel spreadsheet be filed by the contracted auditor in Excel format at the same time the annual audited financial statements are filed. The spreadsheet is not considered audited information, and is only submitted simultaneously. This requirement should not be confused with and does not replace the supplemental schedule (i.e., the single "Reporting Worksheet") included as part of the annual audited financial statements as required by Tennessee Code Annotated. See <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx> [2].

II. In accordance with T.C.A. § 68-221-1010(d)(1) and T.C.A. § 7-82-401(h)(1), failure to include the required schedule constitutes excessive water loss and ... referral to the appropriate board.
THEREFORE, failure to include the AWWA schedule in audited financial statements received by the Comptroller of the Treasury on or after January 1, 2013, will result in the system being referred to the appropriate board.

III. Further, utilities will be referred to the boards based on:

- A. Incomplete AWWA water audit submitted anytime on or after January 1, 2013;*
- B. For audits received by the Comptroller of the Treasury from 1/1/2013 to 12/31/2014 — Validity score of 65 or less or non-revenue water as a percent by cost of operation system of 30 percent or greater;*
- C. For audits received by the Comptroller of the Treasury from 1/1/2015 to 12/31/2016 — Validity score of 70 or less or non-revenue water as a percent by cost of operation system of 25 percent or greater;*
- D. For audits received by the Comptroller of the Treasury from 1/1/2017 to 12/31/2018 — Validity score of 75 or less or non-revenue water as a percent by cost of operation system of 20 percent or greater;*
- E. For audits received by the Comptroller of the Treasury from 1/1/2019 to 12/31/2020 — Validity score of 80 or less or non-revenue water as a percent by cost of operation system of 20 percent or greater.*

Failure to achieve the designated levels will result in a referral to the board(s). The requirements will be reviewed by the boards annually to ensure the desired results are being achieved. The levels are subject to change by approval of the board(s).

Infiltration/inflow (I & I) occurs when outside ground water enters the sewer system. I & I can cost utilities tremendous amounts of money in pumping and treatment costs. Ground water can enter the sewer system in several different ways:

- Through cracks or breaks in the sewer lines;

- Through manholes that are either leaking or located in a low lying area that is prone to being underwater; and
- Through storm water drains or downspouts that are connected to the sewer system.

Many sewer systems are built with pumping stations that pump to the treatment plant. Obviously, if a lot of outside ground water is entering the system, it must be pumped as well. The resulting additional pumping costs are lost dollars as no customer is being billed for the I & I. Once the I & I reaches the plant the treatment costs rise as well through additional labor costs, chemicals, pumping, etc., which are necessary to treat the waste. In a very rainy season, I & I will amount to thousands of dollars each month. In very bad I & I situations the sewer plant may be operating at capacity because of the excess water, and plant expansions costing thousands, or even millions, of dollars have to be made.

Utilities can do several things to help eliminate I & I. Manholes located in low lying areas need to be either raised or moved. Utility employees can inspect manholes when it is raining to see if outside ground water is entering. Leaking manholes can be replaced or repaired. Many sewer utilities use cameras that can be put through sewer lines to check for leakage. These camera units can be bought (perhaps cities located near each other could agree to purchase and share a camera) or rented. There also are companies that cities can contract with to film their lines. Once identified, a priority list can be established for the orderly replacement of the leaking lines. Through the use of smoke testing, utilities can find storm drains and downspouts that are connected to the sewer system. Property owners can be notified to remove the drains and downspouts from the system. Those who refuse may be cited under the city's sewer use ordinances.

Links:

[1] <http://www.AWWA.org>

[2] <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>

DISCLAIMER: The letters and publications written by the MTAS consultants were written based upon the law at the time and/or a specific sets of facts. The laws referenced in the letters and publications may have changed and/or the technical advice provided may not be applicable to your city or circumstances. Always consult with your city attorney or an MTAS consultant before taking any action based on information contained in this website.

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