



MODEL STATE LEGISLATION FOR UTILITY WATER LOSS AUDITS

Background & Purpose

Every water system leaks. Altogether, billions of gallons of water are lost every day from U.S. drinking water systems.

States across the country are taking greater notice of these massive water losses from public water systems, and they are adopting sensible policies for communities to report and reduce these losses.¹ Water main breaks and unseen leaks act like a tax on the cost of drinking water and the reliability of water service. Sustainable communities need reliable and efficient water delivery systems—for public health, fire safety, and good environmental stewardship. However, excessive water losses place additional burdens on water sources and can cast doubt upon a community’s ability to manage its financial and physical assets. Thus, the need for a more objective accounting of water losses and a more strategic understanding of loss reduction strategies is gaining attention across the country.

Engineers are fond of saying “You cannot manage what you cannot measure,” and for decades water losses from public water systems were accepted as an inevitable cost of doing business. But today, more meaningful and actionable assessments are possible. The states at the forefront of water loss reduction strategies are all requiring annual water loss reports from local water suppliers using a standardized format developed by the American Water Works Association (AWWA), the principal trade group for drinking water utilities. In the spirit of cutting losses and maximizing gains, the time has come to measure, manage, and eliminate the unnoticed, uneconomic, and unnecessary waste of water that is happening underfoot.

Validated water loss audits are the first step towards achieving cost-effective reductions in water loss. These audits can be readily conducted by any water utility, at minimal cost. AWWA makes available free auditing software, and an accompanying manual for approximately \$100. Audits are typically performed with modest investment of time by existing utility staff. For example, utilities regulated by the Delaware River Basin Commission reported that, even though most were unfamiliar with the AWWA audit methodology before new Commission regulations required them to submit annual audits, most utilities completed the audit in 1 to 3 days without outside help.²

Moreover, a water loss audit allows a utility to identify water loss control measures that can rapidly save the utility money. “The time to recover the costs of water loss control is typically measured in days, weeks, and months rather than years.”³

¹ NRDC’s webpage, “Cutting Our Losses,” tracks existing state policies. See <http://www.nrdc.org/water/water-loss-reduction.asp>.

² Delaware River Basin Committee, Water Management Advisory Committee, Meeting Summary (June 16, 2015), http://www.nj.gov/drbc/library/documents/WMAC/06162015/wmac_june15.pdf.

³ EPA, “Water Audits and Water Loss Control for Public Water Systems” (2013), p. 1, <http://water.epa.gov/type/drink/pws/smallsystems/upload/epa816f13002.pdf>.

This document presents two versions of model state legislation, which can be adapted for states that do not yet require a full suite of water loss audit, reporting, and validation requirements, based on the AWWA methodology, as well as water loss performance standards to ensure that high-quality audits spur water loss reduction activities that improve a utility's bottom line.

“Version A” is designed for states where regulatory agencies and/or the utility community already have some level of familiarity with the practice of annual water loss audits. This version establishes a comprehensive water loss audit program, phased in over time. Of particular note, the adoption of regulatory requirements for data quality improvement and water loss performance is deferred for at least a year after the initiation of water loss audit reporting. This will allow for an ample pool of validated audit reports to be available for analysis and inform the development of water loss standards, as well as sufficient time for each state's customary stakeholder process to take place. Consideration may also be given to describing the consequences of non-compliance if needed to supplement the current authority of the designated regulatory agency. Additionally, states should prepare to offer technical guidance for utilities subject to the regulatory program to meet any specified performance standard, together with references to sources of financial assistance that may be available to utilities for implementing water loss management activities.

“Version B” is designed for states with less familiarity with water loss audits, which may feel they need a brief period of time to educate policymakers and utilities about the value of audits before establishing mandatory audit requirements. This version requires creation of a report to the Legislature and Governor, to be completed within one year. The report would examine existing water loss control practices in the state and nationally and recommend strategies for reducing water loss in the State, including opportunities to accelerate the standard use of water loss audits by utilities. It is intended that the report would provide a basis for adopting a comprehensive water loss program, along the lines set forth in “Version A” of the model bill.

In the pages below, for each version of the model bill, a brief summary of the legislation is followed by the text of the model bill. Please refer to the summary for an explanation of key provisions, as well as adaptations that may be appropriate based on state-specific circumstances.

Model State Water Loss Reporting Legislation
Version “A” – Comprehensive Annual Water Loss Reporting

SUMMARY

The model legislation draws from existing laws in several states, including Georgia, Texas, and California. NRDC’s website, “Cutting our Losses,” provides for state-by-state summaries and links to existing state legislation and regulations on water loss audits:

<http://www.nrdc.org/water/water-loss-reduction.asp>.

The core elements of the model bill are:

- Section 1: Provides a short title of the bill.
- Section 2: A statement of findings, which provides the rationale for requiring annual water loss audits and audit reporting.
- Section 3:
 - Establishes a size threshold for the public water supply systems that will be subject to water loss reporting requirements. This definition excludes all systems that are considered “small” systems under the federal Safe Drinking Water Act.⁴
 - Identifies the state agency that will implement the law.
 - Explains the meaning of “water loss,” based on the AWWA standard terminology.⁵
 - Explains the concepts of “validating” a water loss audit and “data validity scores”.⁶ Validation is a key step in the AWWA water loss audit methodology to ensure that the level of accuracy of data used in the audit is appropriately characterized.
- Section 4:
 - Requires public water suppliers to perform a water loss audit each year, using the AWWA standard methodology.

⁴ See <http://water.epa.gov/infrastructure/drinkingwater/pws/factoids.cfm>, explaining that systems serving 3,300 or fewer individual are considered “small systems.”

⁵ See <http://www.awwa.org/portals/0/files/resources/water%20knowledge/water%20loss%20control/iwa-awwa-method-awwa-updated.pdf>

⁶ See <http://www.waterrf.org/PublicReportLibrary/4372b.pdf>, at pp. 15-16, explaining the three levels of audit data validation.

- The first annual audit report would be due in two years after enactment of the bill.
 - State regulations would be issued to specify the audit process, including validation and reporting requirements.
 - The state would be required to make audit reports readily available to the public online.
 - Following the initial 2 to 3 years of receipt and review of validated water audits, and taking into account the compiled audit results, the state would then (i) set criteria for ensuring adequate data validity in future audit reports and (ii) establish performance standards for water suppliers to reduce water loss.
- Section 5: Provides for technical assistance to utilities, using available state funds, to support performance and validation of audits. Technical assistance would also be available to help utilities improve water loss detection programs, which can improve the accuracy of audits and help identify specific cost-effective steps to reduce water loss.
 - *Note: New funding authorization is not necessary if state agencies fund these technical assistance activities through the “state set-aside” portions of the Drinking Water State Revolving Fund (DWSRF), which exist in all states. Georgia’s water loss audit program presents a good example of how DWSRF set-aside funds can be used in this way.*⁷

⁷ See Center for Neighborhood Technology, “Stepping Up Water Loss Control: Lessons from the State of Georgia” (2014), page 2, http://www.cnt.org/sites/default/files/publications/CNT_GeorgiaWaterStewardship.pdf.

MODEL BILL TEXT
Comprehensive Annual Water Loss Reporting

Sec. 1. Short Title.

This Act may be cited as the Water Loss Accounting Act of 2016.

Sec. 2. Findings.

The legislature finds that –

- (a) Safe and affordable drinking water is essential to public health and economic development throughout the state.
- (b) The cost of providing reliable drinking water is increasing due to factors such as aging infrastructure, increased energy costs, and more complex and costly changes to the regulatory requirements for safe drinking water.
- (c) Water main breaks are visible and disruptive manifestations of the more widespread phenomenon of leakage from water systems.
- (d) Leakage of drinking water from water distribution systems adds to the cost of service to customers and may lead to increased raw water demands that negatively impact the natural environment.
- (e) The failure to recover revenue from water delivered to users due to metering and billing inaccuracies and theft also increases the cost per unit of water that is billed to customers.
- (f) The American Water Works Association (AWWA), a national association of drinking water utilities and professionals, has recommended that drinking water suppliers conduct an audit of water losses utilizing the methodology as outlined in the M36 manual on an annual basis.
- (g) The AWWA has published software for use in categorizing and reporting water losses and has made such software available without charge.
- (h) Several states now recommend or require public water suppliers under their jurisdiction to conduct an audit of water losses each year using the standardized terms and methods published by the AWWA.
- (i) Regular auditing of water losses is a necessary foundation for the adoption of cost-effective strategies to reduce the amount of lost water and revenue to economically reasonable levels.

Sec. 3. Definitions.

As used in this Act:

(a) “Public Water Supplier” means the owner or operator of a system for the provision to the public of piped water for human consumption, if such system regularly serves more than 3,300 individuals.

(b) “State Agency” means the Official, Board, or Body responsible for issuing and implementing regulations regarding the withdrawal or use of water by public water suppliers.

[DRAFTING NOTE: Paragraph 3(b), and all subsequent references to the term “State Agency,” should be modified to identify the specific state agency to which the Legislature chooses to assign responsibility for implementing this legislation. States typically assign this responsibility to an agency with existing responsibilities for water resource management, or with environmental, public health, or financial oversight of drinking water utilities.]

(c) “Water Loss” means the difference between the annual volume of water entering a water distribution system and the annual volume of metered and/or unmetered water taken by registered customers, the water supplier, and others who are implicitly or explicitly authorized to do so. This includes 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, in addition to unauthorized consumption, all types of metering inaccuracies, and systemic data handling errors.

(d) “Level One Validation” means the process whereby a public water supplier interacts with a technical expert to review and confirm the basis of all data entries in the public water supplier’s water loss audit report and to appropriately characterize the data validity score of the reported data.

(e) “Data Validity Score” means the assessment of the quality of data used in a water loss audit report, as per the data validity scoring system of the AWWA Manual M36 and AWWA Free Water Audit Software.

Sec. 4. Water Loss Program Requirements.

(a) (1) No later than 18 months after the date of enactment of this Act, the State Agency shall adopt rules for all of the following:

(A) The conduct of annual standardized water loss audits by public water suppliers in accordance with the method adopted by the AWWA in the most current edition of Water Audits and Loss Control Programs, Manual M36 and in the AWWA’s Free Water Audit Software.

(B) The process for water loss audit report level one validation prior to submitting the report to the State Agency. This process shall follow the principles and terminology laid out by the AWWA in the latest edition of Water Audits and Loss Control Programs, Manual M36 and in the AWWA’s Free Water Audit Software. A validated water loss

audit report shall include the name and technical qualifications of the person engaged for validation.

(C) The technical qualifications required of a person to engage in level one validation.

(D) The certification requirements for a person selected by a public water supplier to provide level one validation of its own water loss audit report.

(E) The method of submitting a water loss audit report to the State Agency.

(F) Procedures for the acceptance of water loss audit reports voluntarily submitted by water suppliers serving fewer than 3,300 individuals.

(2) The State Agency shall update rules adopted pursuant to paragraph (1) no later than six months after the release of any subsequent editions of the AWWA's "Water Audits and Loss Control Programs, Manual M36."

[DRAFTING NOTE: Paragraph 2 may be modified to allow for a period longer than six months to update State Agency rules if state rule-making typically requires more time to complete.]

(b) No later than 24 months after the date of enactment of this Act, each public water supplier shall submit a completed and validated water loss audit report for the previous calendar year as prescribed by the State Agency pursuant to subsection (a). Annually thereafter, each public water supplier shall submit a completed and validated water loss audit report covering the previous calendar year on or before July 1, or such earlier date as established by rule by the State Agency.

[DRAFTING NOTE: Para. 4(b) provides for a default annual reporting deadline of July 1. A state may wish to change this date to coincide with other relevant reporting deadlines currently applicable to drinking water utilities (e.g., annual reporting of water withdrawals, water production, or consumer confidence), in order to minimize the number of separate filings and reporting periods each utility must address. Additionally, a state may wish to base the reporting year on a utility's fiscal year, rather than calendar year; this can be done by substituting "fiscal year" for calendar year in para. 4(b).]

(c) Each water loss audit report submitted to the State Agency shall be accompanied by information, in a form specified by the State Agency, identifying steps taken in the preceding year to reduce the volume of apparent and real water losses.

(d) At least one of the following employees of a public water supplier shall attest to each water loss audit submitted to the State Agency:

(1) the chief financial officer.

(2) the chief engineer.

(3) the general manager.

(e) The State Agency shall deem incomplete and return to the public water supplier any final water loss audit report found by the State Agency to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A public water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the State Agency.

(f) The State Agency shall post all validated water loss audit reports on its internet website in a manner that allows for comparisons across public water suppliers. The State Agency shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.

(g) No sooner than 36 months and no later than 48 months after the date of enactment of this Act, the State Agency, having taken level one validated water loss audit reports into consideration, shall adopt rules:

(i) specifying a minimum data validity score or a specific level of yearly improvement in the data validity score of future annual water loss audit reports; and

(ii) requiring public water suppliers to meet performance standards for the volume of water losses.

Section 5. Technical and financial assistance.

(a) Within available funds, the State Agency shall make available \$ *[insert funding level, recommended at \$2,000 to \$3,000 per water supplier covered by this bill]* in each of the two fiscal years that commence after the date of enactment of this act for the purpose of procurement of water loss audit report validation assistance for public water suppliers.

(b) Using available funds, the State Agency shall:

(i) provide technical assistance to instruct public water suppliers on the AWWA M36 Manual methodology, data tracking, and use of the Free Water Audit Software;

(ii) provide technical assistance to guide public water suppliers' water loss reduction programs, including, but not limited to, metering techniques (testing, repair, and replacement), pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and active leak detection.

(c) The State Agency is authorized to establish an external technical advisory committee including representatives of nonprofit civic and professional organizations to assist with implementation of the requirements of this Act.

Model State Water Loss Legislation
Version “B” – State Study and Report

SUMMARY

Version “B” of the model bill is designed for states with relatively limited familiarity with water loss audits, where a brief study of water loss issues and water audit methods could educate policymakers and utilities about the value of water audits before establishing mandatory audit requirements. This version requires submission of a report and recommendations to the Legislature and Governor, to be completed within one year, which could provide a basis for subsequently adopting a comprehensive water loss audit program.

The core elements of this model bill are:

- **Section 1:** Provides a short title of the bill.
- **Section 2:** A statement of findings, which provides the rationale for reducing water losses from public water supply systems, and explains why water loss audits are a foundational step towards reducing water losses.
- **Section 3:**
 - Identifies the state agency that will implement the law;
 - Explains the meaning of “water loss” and “water loss control,” based on the AWWA standard terminology;⁸ and
 - Explains the concepts of “validating” a water loss audit and “data validity scores”.⁹ Validation is a key step in the AWWA water loss audit methodology to ensure that the level of accuracy of data used in the audit is appropriately characterized.
- **Section 4:** Requires a study, using available information, that will:
 - characterize the extent of the water loss problem in the state;
 - identify existing water loss control practices in the state and elsewhere, including their costs and benefits;
 - summarize the currently available methods for water loss auditing; and
 - recommend programs and policies the state can implement to improve water loss control, accounting, and transparency, including opportunities to accelerate statewide adoption of water loss auditing by utilities.

⁸ See <http://www.awwa.org/portals/0/files/resources/water%20knowledge/water%20loss%20control/iwa-awwa-method-awwa-updated.pdf>

⁹ See <http://www.waterrf.org/PublicReportLibrary/4372b.pdf>, at pp. 15-16, explaining the three levels of audit data validation.

MODEL BILL TEXT
State Study and Report

Section 1. Short title.

This Act may be cited as the Water Loss Accounting Awareness Act of 2016.

Section 2. Findings.

The legislature finds that –

a) Safe and affordable drinking water is essential to public health and economic development throughout the State.

b) The cost of providing reliable drinking water is increasing due to factors such as aging infrastructure, increased energy costs, and more complex and costly changes to the regulatory requirements for safe drinking water.

c) Water main breaks are visible and disruptive manifestations of the more widespread phenomenon of leakage from water systems.

d) Leakage of drinking water from water distribution systems adds to the cost of service to customers and may lead to increased raw water demands that negatively impact the natural environment.

e) The failure to recover revenue from water delivered to users due to metering and billing inaccuracies and theft also increases the cost per unit of water that is billed to customers.

f) The American Water Works Association (AWWA), a national association of drinking water utilities and professionals, has recommended that drinking water suppliers conduct an audit of water losses on an annual basis.

g) The AWWA has published software for use in categorizing and reporting water losses and has made such software available without charge.

h) Several states now recommend or require public water suppliers under their jurisdiction to conduct an audit of water losses each year using the standardized terms and methods published by the AWWA.

i) Regular auditing of water losses is a necessary foundation for the adoption of cost-effective strategies to reduce the amount of lost water and revenue to economically reasonable levels.

Section 3. Definitions.

As used in this Act:

(a) “State Agency” means the Official, Board, or Body responsible for submitting the report required by Section 4 of this Act.

[DRAFTING NOTE: Paragraph 3(a), and all subsequent references to the term “State Agency”, should be modified to identify the specific state agency to which the Legislature chooses to assign responsibility for implementing this legislation. States typically assign this responsibility to an agency with existing responsibilities for water resource management, or with environmental, public health, or financial oversight of drinking water utilities.]

(b) “Water Loss” means the difference between the annual volume of water entering a water distribution system and the annual volume of metered and/or unmetered water taken by registered customers, the water supplier, and others who are implicitly or explicitly authorized to do so. This includes 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, in addition to unauthorized consumption, all types of metering inaccuracies, and systemic data handling errors.

(c) “Water loss control” means the efforts of drinking water utilities to provide accountability in their operation by reliably auditing their water distribution systems and implementing controls to reduce water losses.

(d) “Level One Validation” means the process whereby a public water supplier interacts with a technical expert to review and confirm the basis of all data entries in the public water supplier’s water loss audit report and to appropriately characterize the data validity score of the reported data.

(e) “Data Validity Score” means the assessment of the quality of data used in a water loss audit report, as per the data validity scoring system of the AWWA Manual M36 and AWWA Free Water Audit Software.

Section 4. Water loss study and report.

(a) Within one year after the date of enactment of this Act, the State Agency, in consultation with *[LIST OF OTHER LOCAL, STATE AND/OR FEDERAL AGENCIES]* and other local and regional water management leaders and interested parties as the State Agency deems appropriate, shall submit to the Legislature and the Governor a report on water loss in this State, consisting of a summary and evaluation of existing data, policies, procedures, and institutional knowledge drawn from publicly available reports and data files of the State Agency, other state agencies, the US Environmental Protection Agency, and the American Water Works Association.

(b) Such report shall include coverage of the following issues:

(1) The overall extent and cost of water loss from the drinking water distribution infrastructure throughout the state, including, at a minimum, information that is readily available or easily and cost-effectively obtainable concerning:

(A) Estimates of the volume and economic costs of water loss from water distribution infrastructure;

(B) Estimates of the costs associated with water infrastructure failure such as main breaks, system disruption, property damage, and expenditures for treating and pumping unused or lost water; and

(C) Evaluation of the impact water loss has on other identified demands for water supply and resource management, including increasing climate-related drought, commercial and industrial demand, energy production and consumption, and related impacts.

(2) Current water loss practices within this State and nationally, along with information on the costs and benefits of these practices, including:

(A) A summary of the types of water loss accounting approaches used by public and private water supply utilities in this State;

(B) Policies, practices, and procedures in other states that have adopted regulations, standards, or guidance for water loss accounting and level one validation; and

(C) Information that is readily available or easily and cost-effectively obtainable regarding:

(i) the identified costs or benefits of the existing water loss accounting activities identified in paragraphs 4(b)(2)(A) and (B); and

(ii) the potential costs and benefits to this State of implementing standardized water loss accounting.

(c) Based on the findings under paragraph 4(b), the report shall also provide recommendations concerning, at a minimum:

(1) Cost-effective strategies for this State to improve water loss accounting, water loss control, water loss report validation, and public transparency concerning water loss conditions, including, at a minimum:

(A) A summary of currently available water loss auditing methods, such as the American Water Works Association (AWWA) methodology, including “Water Audits and Loss Control Programs, Manual M36” and the accompanying free audit software;

(B) A description of level one validation of water loss audit reports; and

(C) Policies and practices to improve public reporting of water losses.

(2) Opportunities to accelerate statewide adoption of water loss accounting and annual reporting by public water suppliers, including a timeline for implementation.

(3) The advisability of establishing an external technical advisory committee and creating partnerships with nonprofit civic and professional organizations to assist with implementation of recommendations made under paragraphs 4(c)(1) and (2).