
Water Audits

What is a Water Audit?

A water audit is an evaluation of all water, used & unused, throughout a water system. It will determine the amount of “unbilled” and “unaccounted for” water lost, for environmental and billing purposes.

Unbilled Water is any water for which there is no financial compensation obtained.

Examples: government use, leaks, inaccurate meters, maintenance, firefighting, and stolen water.

Unaccounted for water is any amount of water where the destination cannot be determined.

Examples: leaks, inaccurate meters and stolen water.

Why Perform a Water Audit?

1. System Direction

A water audit can show what needs to be done to improve a water system. It helps in:

- **Building Revenue Responsibility:** Determine the best areas to direct funds – are capital improvements needed, or do other areas need to be addressed? Also forecast improvements needed versus revenue, and the system’s future needs.
- **Personnel Planning:** Determine areas of the system that personnel need to address. Discover potential inefficiencies of irrigation or flushing.
- **System Evaluation:** Determine the condition of the system, and track system conditions from year to year. Also track areas that may be more prone to repair (corrosive or unstable soil).
- **Creating a Repair Timeline:** Are repairs needed immediately? Is the system digressing further than expected? Is a master meter calibration or a full replacement needed?

2. Increased Revenue

Use a water audit to find which areas of the current process can be improved to save money and water loss over time.

- **Reduce Expenses:** Get paid for the water used, and reduce electrical and chemical costs.
- **Increased Water Sales:** If the meters are updated, they may begin metering previously untracked water.

- **Resource Management:** Reducing water loss helps conserve water.

3. Accountability

A water audit provides better accountability throughout the water system. It allows for better:

- **Public Relations:** Show the public responsible management of their finances and resources, and provides information about Government usage.
- **Equality Between Users:** By ensuring both older and newer meters are reading accurately, guarantee that everyone pays according to what they have used.
- **Financial Accountability:** Waste less money, and charge other users the correct amounts for water used.
- **Personnel Efficiency:** Direct personnel where most needed and gain efficiencies. Plus, there will be less emergency repairs as the system improves.

4. Meet EPA Recommendations

The EPA's recommendation for "unaccounted for" water is 10% or less. It was 15% prior to the year 2000.

The EPA's purpose is to:

- a. Improve water quality
- b. Maintain aquatic systems
- c. Protect drinking water resources

The EPA also recommends that systems:

- a. Strive for universal metering
- b. Consider a reclaimed water distribution system
- c. Ensure all hydrants are tamper proof to prevent theft or unauthorized use

Basic Water Audits

A **Basic Water Audit** gives a general idea of water production vs. water consumption. It DOES NOT differentiate where water is being lost. It can let you know whether or not a more comprehensive water audit is needed.

A Basic Water Audit should be performed once a year, or when production numbers seem high. Remember the EPA recommendation for "unaccounted for" water is 10% or less.

To Calculate for Unbilled Water/Year:

Add total metered water for the year. Then, add total water entering system for the year. Use the formula as shown below:

$$1 - (\text{total metered water} \div \text{water entering system}) \times 100$$

Example: Over the year, there was a total of 289,966,000 MG of water, and a total of 335,442,000 MG of water produced.

$$1 - (289966000 \div 335442000) \times 100 = 13.56\% \text{ Total unbilled water/year.}$$

Basic Water Audit Sample Data

	WATER ENTERING SYSTEM	TOTAL METERED WATER
JAN	14,736,000	11,232,000
FEB	13,584,000	12,286,000
MAR	19,112,000	14,931,000
APR	17,776,000	14,310,000
MAY	19,932,000	16,153,000
JUNE	43,270,000	41,641,000
JULY	50,717,000	48,062,000
AUG	49,946,000	46,230,000
SEP	43,270,000	39,802,000
OCT	22,031,000	18,365,000
NOV	23,342,000	15,526,000
DEC	17,726,000	11,428,000
TOTAL	335,442,000	289,966,000
TOTAL UNBILLED WATER 13.56%		

Comprehensive Water Audits*

A **Comprehensive Water Audit** gives a more specific idea of water production vs. water consumption. It can show where water is being lost. A Comprehensive Water Audit should be performed at least every three years, and whenever a basic audit shows significant change.

A Comprehensive Water Audit is designed for systems with minimal significant water events. Significant water events include mainline breaks, irrigation, fires and flushing. Multiple significant events increase chance of error.

To perform a Comprehensive Water Audit:

- Determination of meter inaccuracy is needed.
- Need to determine leaks and stolen water amounts.
- Determination of flushing and fire suppression events is needed.

- Need to determine city use (irrigation).

Water Audit Summary

The Basic Water Audit should be completed every year as a part of annual reporting, much like the Consumer Confidence Report.

The Comprehensive Water Audit should be done every three years and when the Basic Water Audit shows a substantial change (greater than 2%). Together, these surveys will provide the system:

- **Accountability** with the public and regulatory agencies concerning “unaccounted for” water.
- **Understanding** to communicate needs and information to funding agencies.
- **Data** for decision-making in order to direct funds appropriately.
- **Information** concerning revenue losses for your system.
- **Tracking** to determine how the system is degrading over time.

* For more information about Comprehensive Water Audits, please contact SKE Construction, LLC at info@ske1.net.