



Beech Mountain Water Education/Information Sheet

Water Loss

Aging and leaking water distributions system infrastructure, combined with ongoing water scarcity concerns are changing how utilities manage their water systems across the United States. To effectively manage the water within a distribution system, a utility must first quantify water consumption and loss. Modern technology starts with classifying water as revenue or nonrevenue water. Nonrevenue water is further broken down into unauthorized consumption and water loss. Unbilled authorized consumption is normally water used by the water department, either in operations of the water system or within the community owned facilities.

Real water losses are the annual volume lost through all types of leaks, breaks and overflows on mains, service reservoirs and service connections on the utility's side of the consumers' water meter. Apparent losses include unauthorized unbilled consumption, customer metering inaccuracies and systemic data handling errors. It is important for water utilities to inventory and minimize both real and apparent losses because both have an impact on the finances of the water utility.

In 2014 the American Water Works Association (AWWA) released Version 5 <https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control> of their free water audit software. This Excel spreadsheet offers a starting point to track water loss within a distribution system. The spreadsheet offers a consistent benchmarking tool for water utilities to compare themselves to other water systems and to track their own progress through time.

A water **AUDIT** can be defined as:

An accounting practice for any water system to help;

- Understand water consumption and losses that occur in a 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.

The financial implications of water loss can be considerable, but the cost of water loss must be balanced against the cost to reduce the water loss. The AWWA software helps communities develop annual water loss costs. The cost of the apparent losses is based on the retail price of the water since this water would otherwise have been billed. The cost of real losses is based on the operational costs of the system because this is water that would not have been billed, but simply lost within the system prior to customer use.

A water utility can capitalize on the many benefits of a water audit and reducing water loss can lead to:

- **Reduction** in operating costs;
- **Reduction** in future capital projects and maintenance;
- **Increased** revenues to the system;
- **Demonstrating** that the utility holds itself accountable to taxpayers and customers;
- **Good** stewardship of a limited resource.

Beech Mountain began tracking its water losses in 2010 with the Rothrock Report. At that time, water loss was estimated at 70% due to an aging infrastructure and a high-pressure system due to the mountainous terrain of the Town. The first step taken was to identify all water connections and revamp the Town's water billing system. The Town then installed radio read water meters on all customer taps, at a cost of \$1,200,000. This allowed for real time monitoring of water usage, which, in a seasonal customer environment and harsh weather meant that water leaks were stopped and detected much earlier.

Subsequently, the Town purchased several leak detectors to identify system leaks. It then committed to a comprehensive plan to upgrade main water lines, as well as individual connections. The Town is also in the process of upgrading its fire hydrants. It has also installed several pressure reducing stations at various locations within the system. The total cost of these upgrades will be in excess of \$12,000,000 over the next ten years. This does not include the Watauga Water Intake. Beech Mountain has a plan in place to fund these upgrades and improvements through increases in rates and this should reduce water loss to under 40%.

