

Water Loss a Fiscal Enemy

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Every operator fights a never-ending battle to keep the product that they produce in its container until the actual intended point of sale. The enemy? Container failure! Large leaks are very often viewed as nothing more than an often inconveniently timed maintenance task, that must be dealt with swiftly. If not they can lead to other serious problems

as well. Some of these issues may be washed out and/or collapsed roadways, flooded basements, icing of roadways and even cause us to lose our ability to meet the demand of the system. Surely these leaks get attention quickly, but strangely enough these aren't the ones that cost us the most loss in our systems.

Consider this. If we have three small leaks that are each operating at approximately three gallons per minute, over three months we have lost 1,166,400 gallons of water. This is not a far fetched scenario, considering that a three gallon per minute leak could easily find it's way to the sewer collection or storm drain systems, not surface, and go undetected for a great deal more than 90 days.

These are the true "thieves", much like a shoplifter is to a retail store, who comes and goes unnoticed robbing them of their wares. Also much like the retail store, this "product loss" would never be detected without an inventory. How does a water system do an inventory? Simple: Production (minus) Sales (equals) Loss.

Or to put it into terms of percentage of accountability: Sales (divided by) Production (equals) Percent of Accountability.

If this is sounding somewhat like a business management article..... well maybe that's because the operation of our water system is, and rightly should be, viewed as a business venture with very realistic things that can, and will, cut into our budgets. Let's look back to our hypothetical system with the three leaks. If that were a small rural system producing 200,000 gallons per day, then the loss we discussed would represent almost 6 days worth of production during that 90 day period. Substantial, and worth thinking about, don't you agree? And yet this system is operating at 93.5% accountable, much higher than most systems realistically achieve. Is your system in need of a new backhoe, truck or some other major piece of equipment that current budget constraints are keeping out of reach? Maybe these "small" leaks could make the difference as to whether or not you can order those things next year.

I came across the following "Guidance Document" on the Massachusetts D.E.P. website and thought it a quite fitting piece to add here.

11.3.7 Leak Detection and Unaccounted for Water

Each PWS should adopt a policy for leak detection and tracing of "unaccounted-for" water. All connections, including public buildings, should be metered, (See Section 11.3.4, Water Rate Policy). A full leak detection survey of the distribution system should be completed every two years; identified leaks should be repaired within a year. The PWS should calibrate its master meters annually, (at a minimum), to ensure water meter accuracy. There should be a program to replace or rebuild water meters for each connection on a 10-year cycle. The policy should include a requirement that all large quantity water users calibrate their meters each year at their expense.

For a well-run PWS, the amount of unaccounted water should be below 10% of total water consumption, and should remain under 15% at all times. Water systems should monitor tanks and lines for leaks, and implement a leak detection program.

PWS should encourage their customers to conduct on-site leak detection. By reducing the amount of "unaccounted for" water, the system may:

- Reduce costs of operation by reducing electricity and pumping cost
- Reduce impacts on ground water wells by pumping less
- Delay the need to add another source, add storage, increase pipe sizes, or increase treatment capacity
- Increase the life span of equipment

Note: If a new withdrawal or source over 100,000 gallons per day is being considered, the Water Management Act requires careful attention to water conservation with special attention directed at reducing the amount of unaccounted for water. (See Chapter 10, Water Management Act Requirements). If a water supply source requires an Interbasin Transfer Act approval, the water conservation plan must meet the Interbasin Transfer Act Performance Standards adopted by the Water Resource Commission in 1999.

We've all heard of how important it is to get out there during those twilight hours and listen on our system (generally hydrants) in an attempt to find these thieves. I don't think that there is much in the way of replacement for the seasoned operator diligently and routinely carrying out this task.

However I have recently been exposed to a new technology that may someday make me eat those words. It is not so much a new technology as it is a coupling of two others currently in use. This equipment takes the sensor technology used in water leak correlation equipment, and combines that with the radio read style of data collection used in water

