

# Water loss; what is it and where does it go?

**E**very water system has some type of water loss. It may not be visible, but there is a physical loss. Inaccurate metering is the only reason a system would not show a water loss – but inaccurate metering creates fictional reports, regardless.

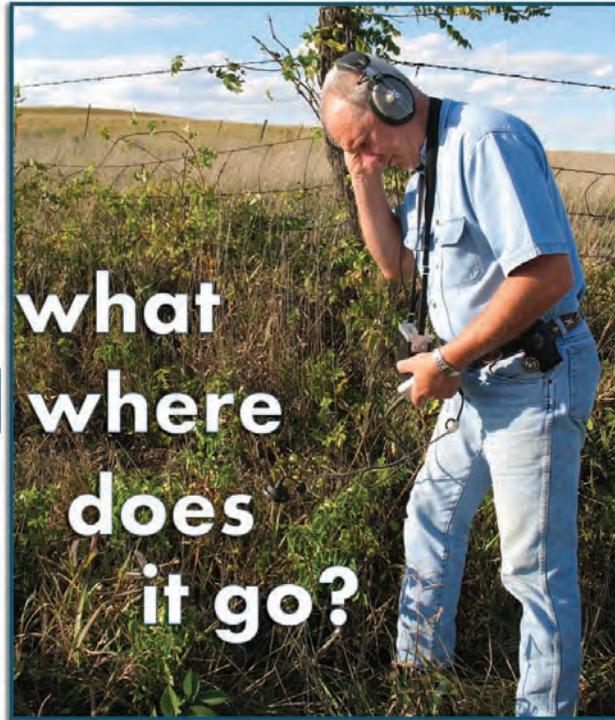
An unaccounted for water loss affects all water systems, no matter the size, no matter the type. A water system cannot “make” water after the point of purchase or supply source. Controlling high unaccounted for loss is a challenge for many systems. Kansas Rural Water Association is presently working with 38 systems that have a loss of 30 percent or greater. Not controlled, high unaccounted for water loss can be an economic disaster for a water system.

There are some remedies for this problem though, and one is relatively easy. If your water system wants to reduce unaccounted for loss, then begin by doing regular calculations of the loss. Unaccounted for loss is the difference between the quantity of water that is purchased or produced and the amount of water sold to customers, subtracting any water metered free or used for purposes that are “accounted for” such as fire fighting or flushing. Water used in the treatment process would also need to be subtracted.

Unaccounted for water loss is normally shown as a percentage and also in gallons per minute (gpm). A good goal is to maintain an unaccounted for loss less than 15 percent. One very important thing to keep in mind is that a percentage figure can be very misleading. A 15 percent loss in one system can be 10 gpm, but in another system it can be 300 gpm. GPM is just as important as percentage when it comes to unaccounted for water loss. It is not uncommon these days for a water system to have a loss of 30

percent or higher. If a system reaches loss of 30 percent or higher at the end of the year, you will fall under the State of Kansas’ “Special Focus” listing. Systems that fall into this list receive additional attention and assistance to help reduce water losses. To be removed from the Special Focus listing, a system must maintain a water loss of 20 percent or less for two quarters. That is the goal for the 38 systems KRWA is presently assisting with leak detection, other monitoring and review to help reduce high unaccounted for water loss.

Another cause of water loss may be in the accuracy of water meters. It has been said many times that your water meters are the cash registers of the water system. Meters record the usage which in turn generates bills that brings in revenue. It is very important to ensure that all of the meters are accurate. If they are not, then the system will lose money. We all know that as meters age, the degree of accuracy is reduced. Normally the first area to be affected will be registration of low flows by the meter. Some water systems replace residential meters when usage reaches one million gallons. It is helpful to have a written policy that deals with the checking and replacement of the system water



KRWA staff can assist in conducting a Water Loss Survey for your water system.



Not all leaks will come to the surface, but this one did.



Even in the winter, water leaks can be located.

When it comes to water meters, another important area to look at is to ensure that they are installed correctly. It is critical that large meters be installed in accordance with manufacturers' specifications. This lack of compliance is a major contributor to some communities having inaccurate water use data.

Fire fighting or use of water for fire protection can be a significant contributor to high unaccounted for water loss. When fighting a fire, the

department does not have time to install a meter on the hydrant as it draws water to fill tanks. Talking to the department as soon as is possible after the fire should provide a reasonably accurate accounting of the water used to fight the fire. If this is not possible, then talk with the department to ensure that they keep a running account of the amount of water used on a monthly basis. Also find out if the department flow tests hydrants.

Keeping track of unaccounted for water loss can be frustrating for a water system especially if you are only

looking at data that covers a short time span. One of the best approaches is to use a 12-month accounting of billings and production/pumpage. This review will identify trends in water usage. Accounting for water loss is an ongoing process for all water systems. With the infrastructure getting older it is only a matter of time before it fails. Systems must be willing to make the

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Steve Patience, operator Linn RWD 2, locates a leak that he had been searching for.



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**Improper meter installation can cause meters to register high or low. Be sure to install meters according to the manufacturer's instructions.**

effort to search for the contributors to high water loss as a continuous practice.

Leak detection is an important component to keep unaccounted for water loss down. Leaks in a distribution system may account for a large portion of the system water loss. A distribution system will always have leaks of some kind but the goal should be to keep loss as low as possible. Water systems can choose to obtain

leak detection equipment on their own, or they can bring someone in from the outside to perform a leak detection survey. If your water system chooses to obtain your own equipment, you will need to train your personnel to use it to check for the leaks. This type of equipment can range from something very simple and inexpensive to the elaborate top of the line leak correlators costing

tens of thousands of dollars. As the level of equipment increases in sophistication, operators will need

additional training to use the new equipment. If you do choose to purchase the more expensive leak detection equipment, it may not be money well spent if the equipment is not used very often. KRWA can assist your water system in conducting a water loss survey. We have some of the latest leak detection equipment on the market and can help locate your leaks in most cases.

High unaccounted for water loss is a financial drain on a water system. How expensive it gets depends upon the system personnel and governing body. Today's water systems must be monitored and maintained to accurately account for water loss. There is no excuse to not do so.

**You cannot justify spending a lot of money and man hours looking for leaks that may not even exist.**

*Gary Armentrout has been a Technical Assistant for KRWA since Dec. 1999. Gary holds a Class 1 Wastewater Operator certification and worked in a water plant for more than six years.*





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