

Purchased Water and Its Un-billed “Additional” Cost



Many cities and rural water districts are purchasing or are considering purchasing water from another water supplier. The water is usually sold at a bulk water price; the price is typically expressed in cost per 1,000 gallons. For example, \$5.00 per 1,000 gallons might be a bulk water price.

When a water supply system is evaluating the purchase price, there are two factors to consider that affect the real cost to the buyer’s customers. First, what is the un-billable water “loss”? And second, what will the subsequent cost of water be at the customers’ meters?

The un-billable water is water that is purchased but is not billed or sold. The un-billable water includes water from leaks and breaks in water lines. It includes water from the operation of the distribution system such as storage tank overflows, “dumping” of storage tank water, and flushing of water lines. The un-billed water also includes water not registered by inaccurate water meters. The unbilled water may include water metered or not metered but not billed for such as water used at city buildings, fire stations, city parks, city power plants, and other public places.

The un-billed water loss can be expressed as a percentage of the water purchased or estimated to be purchased. The annual water use reports that many water suppliers submit to the Kansas Department of Agriculture (KDA) can be used to estimate the un-billed water and to

estimate or determine the amount of water purchased or to be purchased.

For example, if a city pumped 10 million gallons (MG) in a year from city wells and the metered-free water and unaccounted water shown in the KDA report totaled 2 MG, then the un-billed water would be 2 MG and the un-billed water “loss” would be 20 percent. Reports from recent years should be reviewed to determine the

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high, low, and average un-billed water loss.

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purchase water price of \$5.00 per 1,000 gallons and 20 percent un-billed water, the price to the paying customers would be \$6.25 per 1,000 gallons just to cover the \$5.00 price.

An easy way to think of this in the example is for every 1,000 gallons purchased, 800 gallons are sold and 200 gallons are “lost”. The \$5.00 purchase price must be covered in the 800 gallons sold; thus the selling price per gallon must be $\$5.00 / 800$ or 0.00625¢ per gallon or \$6.25 per 1,000 gallons.

It is important to remember that the cost of operation, maintenance, staff, and debt must also be incorporated into the customers’ price. The \$5.00 bulk water price has now become much higher for the paying customer.

Table 1 shows what the customer price must be to recover costs for bulk water purchased for different bulk prices and unbilled water losses. Table 2 shows how much the customer price would be in excess of the bulk purchase price. These tables show the

TABLE 1: Cost Per 1,000 Gallons to Recover Bulk Water Purchase Price Due to Water Loss

	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00
10%	\$4.44	\$5.00	\$5.56	\$6.11	\$6.67
15%	\$4.71	\$5.29	\$5.88	\$6.47	\$7.06
20%	\$5.00	\$5.63	\$6.25	\$6.88	\$7.50
25%	\$5.33	\$6.00	\$6.67	\$7.33	\$8.00
30%	\$5.71	\$6.43	\$7.14	\$7.86	\$8.57
35%	\$6.15	\$6.92	\$7.69	\$8.46	\$9.23
40%	\$6.67	\$7.50	\$8.33	\$9.17	\$10.00

% Un-billed Water (1)

(1) Un-billed water as a percent of water purchased

TABLE 2: Increase in Customer Price Per 1,000 Gallons Above the Bulk Water Purchase Price

	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00
10%	\$0.44	\$0.50	\$0.56	\$0.61	\$0.67
15%	\$0.71	\$0.79	\$0.88	\$0.97	\$0.56
20%	\$1.00	\$1.13	\$1.25	\$1.38	\$1.50
25%	\$1.33	\$1.50	\$1.67	\$2.33	\$2.00
30%	\$1.71	\$1.93	\$2.14	\$2.36	\$2.57
35%	\$2.15	\$2.42	\$2.69	\$2.96	\$3.23
40%	\$2.67	\$3.00	\$3.33	\$3.67	\$4.00

% Un-billed Water (1)

(1) Un-billed water as a percent of water purchased

significant affect that the un-billed water loss has on the paying customer. The price differential increases as the bulk price increases and as the un-billed water loss increases. The table shows that the customers' price is indeed higher than the bulk price. These tables also show that it does "pay" to keep water loss low.

The issue of the higher price that customers pay for the bulk water even before other costs are added has affected decisions made by city councils and RWD boards. Some of the decisions that were made were to not purchase water and other decisions were made after purchasing was well underway. I would like to explain several examples.

Several years ago, two RWDs in one county had the opportunity to purchase water from another supplier. The two RWDs were initially interested because the potential supplier was thought to be a more reliable water supply for the future. In evaluating the proposed purchase price, the two boards decided against purchasing water. The proposed purchase price was around \$5.00 per 1,000 gallons and the un-billed water loss was 30 percent in one RWD and 40 percent in the other. The resultant costs to their customers were much higher than each RWD's existing well water supply.

Another city recently had an offer to purchase water from another supplier. The city had a water supply system that did not meet EPA regulations. The water supplier offered water and a nearby hookup for \$7.00 per 1,000

gallons. The city added the additional cost of their un-billed water loss and the cost of operating their water supply. The resultant cost would be between \$10 and \$11 per 1,000 gallons to the city customers! The council thought that price was too high and decided against purchasing water.

In another case, a RWD has had difficulty during summer months in maintaining combined chlorine residual in its distribution system and standpipes. The operators have done considerable flushing of water lines and overflowing of water storage facilities to maintain KDHE required levels. This flushing and overflowing have greatly increased the un-billed water to \$35,000 per summer. The RWD purchases water from a nearby large city. The RWD has thus had to cut back water flushing to keep the customers' water rates from increasing.

Recently, another city has ceased purchasing water from a long time supplier, as the purchase cost had been increasing and the "real" cost was exacerbated by the city's 20 percent un-billed water loss. The city has gone back to its city well that the city put on standby many years ago due to manganese levels. The city decided that the continued high customer water price was more than their customers could afford.

Another city had to increase water rates because it began purchasing water from another supplier. The decision to purchase water was because the city's previous water treatment plant did not

meet EPA standards.

Unfortunately, two situations caused the customers' "real" price of the water to go higher than ever anticipated. First, the purchase price was more than the production price of the plant water. But what they had not considered was that they would have to also cover the 20 percent un-billed water loss in town. Thus, the customers' water rates had to be increased for the higher bulk water price and for the un-billed water loss.

In many cases, Kansas water suppliers are facing tough times. The costs of operation, maintenance, sampling, staff and benefits are increasing. For many water suppliers the amount of water sales are either holding steady or are decreasing. This results in having to consider increasing customers' water rates when some customers can least afford it. And as water sales decrease, the percentage of un-billed water may increase, thus putting additional pressure on customers' rates.

Understanding how un-billed water loss increases water rates is important in attempting to operate a water supply system on a sound financial basis. And a sound financial basis is needed in order for the other aspects of the system to operate successfully. Reducing the un-billed water loss is beneficial to any system especially those systems purchasing or considering purchasing water at high prices. I encourage anyone who would like to discuss this topic further or that wishes to have assistance with reducing water loss to contact KRWA. Email me at pat@krwa.net or call the KRWA office at 785-336-3760.

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