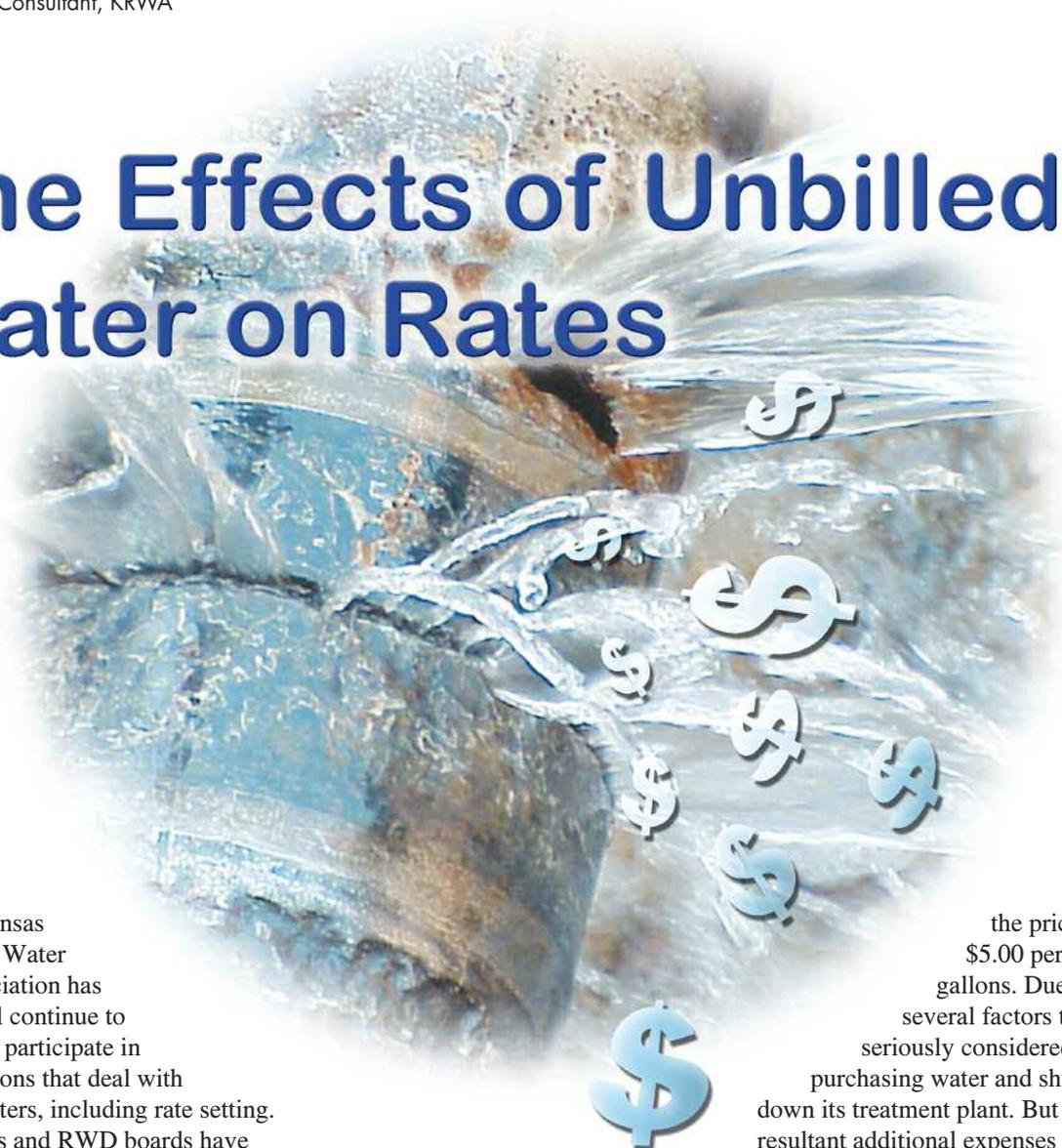


The Effects of Unbilled Water on Rates



The Kansas Rural Water Association has been and will continue to facilitate and participate in training sessions that deal with financial matters, including rate setting. City Councils and RWD boards have the responsibility and challenge to operate the water utility in a sound, fiscal manner. This includes ensuring that operating revenues are adequate to meet operating expenses. I would like to address the matter of water loss and its impact on utilities. The following example is a small water utility that had to address unbilled water and its affect on the decision to purchase water from another water supplier.

Utility description

The small Kansas water utility has 250 residential meters. In a recent year this system produced 24.869 million gallons (MG); it sold 14.858 MG. That amounts to 10.011 MG of unbilled water or a loss of 40.3 percent. This

Due to several factors the utility seriously considered purchasing water and shutting down its treatment plant.

amount of loss is high by Kansas standards where the average loss for most systems is the range of 10 percent to 20 percent. It is believed that the major water loss at this utility is from poor condition pipe resulting in leaks and numerous breaks.

This water utility has a small treatment plant. The utility was approached by another water supplier and was offered bulk, treated water at

the price of \$5.00 per 1,000 gallons. Due to several factors the utility seriously considered purchasing water and shutting down its treatment plant. But the resultant additional expenses had considerable effect on the utility's budgets and its customers' water rates.

2011 operating loss

The table on the opposite page lists the utility's recent annual revenue and expenses in Column 2. The major sources of revenues were the monthly base charges (item 1) and water sales (item 2) to the customers; that's similar to all public water supplies. Presently, the customers pay a \$10 per month base charge and \$4.37 per 1,000 gallons used.

On the expenses, the major expenses were items 9 and 10 for labor. All the expenses were mainly fixed costs, – that is, costs incurred regardless of the amount of water produced or sold. The

Example, Kansas Public Water Supply No. 1

(Note: Values in **RED** are variable expenses).

Item #	Revenue	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
		Water Loss Actual: 40%		Water Loss Reduce to 30%	Water Loss Reduce to 20%	Water Loss Reduce to 10%	Purchase at \$5.00
1	Water Unit Sales	\$64,964.66		\$64,964.66	\$64,964.66	\$64,964.66	\$64,964.66
2	Monthly Base Service Charges	\$33,000.00		\$33,000.00	\$33,000.00	\$33,000.00	\$33,000.00
3	Late Payment Charges	\$1,191.40		\$1,191.40	\$1,191.40	\$1,191.40	\$1,191.40
4	State Fee, Water Protection	\$475.46		\$475.46	\$475.46	\$475.46	\$475.46
5	State Clean Drinking Water Fee	\$445.74		\$445.74	\$445.74	\$445.74	\$445.74
6	New Water Meter Sales	\$5,500.00		\$5,500.00	\$5,500.00	\$5,500.00	\$5,500.00
7	Interest Income	\$3,338.91		\$3,338.91	\$3,338.91	\$3,338.91	\$3,338.91
8	Total Revenue	\$108,916.17		\$108,916.17	\$108,916.17	\$108,916.17	\$108,916.17
	Expenses						Purchase Expense \$124,345.00
9	Wages and Benefits	\$60,000.00	Fixed	\$60,000.00	\$60,000.00	\$60,000.00	\$60,000.00
10	Meter Reading Labor	\$12,090.00	Fixed	\$12,090.00	\$12,090.00	\$12,090.00	\$12,090.00
11	Maintenance Materials	\$371.29	Fixed	\$371.29	\$371.29	\$371.29	\$371.29
12	Water Line Repairs	\$14,405.20	Fixed	\$14,405.20	\$14,405.20	\$14,405.20	\$14,405.20
13	Plant Chemicals and Materials	\$5,023.51	Variable	\$4,287.63	\$3,751.73	\$3,336.54	\$0.00
14	Plant Equipment	\$2,785.87	Fixed	\$2,785.87	\$2,785.87	\$2,785.87	\$2,785.87
15	Rent	\$118.50	Fixed	\$118.50	\$118.50	\$118.50	\$118.50
16	Office Supplies	\$2,084.94	Fixed	\$2,084.94	\$2,084.94	\$2,084.94	\$2,084.94
17	Postage	\$1,408.86	Fixed	\$1,408.86	\$1,408.86	\$1,408.86	\$1,408.86
18	Utilities	\$11,583.31	Variable	\$9,889.06	\$8,650.80	\$7,693.47	\$0.00
19	Memberships	\$305.68	Fixed	\$305.68	\$305.68	\$305.68	\$305.68
20	Insurance	\$4,198.47	Fixed	\$4,198.47	\$4,198.47	\$4,198.47	\$4,198.47
21	Legal	\$452.50	Fixed	\$452.50	\$452.50	\$452.50	\$452.50
22	State Fee, Water Protection	\$475.46	Pass Thru	\$475.46	\$475.46	\$475.46	\$475.46
23	State Clean Drinking Water Fee	\$445.74	Pass Thru	\$445.74	\$445.74	\$445.74	\$445.74
24	Water Testing Fees	\$521.33	Fixed	\$521.33	\$521.33	\$521.33	\$521.33
25	Total Expenses	\$116,270.66		\$113,840.53	\$112,066.37	\$110,693.85	\$224,008.84
26	Net Revenue	-\$7,354.49		-\$4,924.36	-\$3,150.20	-\$1,777.68	-\$115,092.67

fixed costs were approximately 86 percent of the total costs.

Items 13 and 18 were variable expenses associated with the treatment plant. Variable expenses are expenses incurred in direct proportion to the amount of water produced or sold. The variable expenses were approximately 14 percent of the total expenses.

As can be seen at the bottom of Column 2, the utility lost \$7,354.49. This was mainly due to higher than budgeted water line repairs reflected in items 9 and 12. The utility has around \$90,000 in the bank so the loss is adequately covered.

Unbilled water reduction and savings

Due to the high unbilled water loss of 40 percent, an evaluation was made on the financial result of reducing the water loss to 30 percent, 20 percent and 10 percent. The table shows what the result of reducing the water loss would have been on the year's net revenue in columns 3, 4, and 5. The expense reductions were from reductions in the

variable expenses (items 13 and 18) associated producing less water from the water treatment plant. Reducing water loss does not have an appreciable affect on reducing fixed expenses.

The increase in net income due to reducing the unbilled water loss might be less than one might hope. That is because the variable expenses associated with the treatment plant are approximately \$0.57 per 1,000 gallons treated. In other systems such as those that purchase water for a much higher price, the increase in net income could be significantly greater both in dollars and percentage of revenue.

Evaluating water purchase proposal

The previously mentioned water supplier was offered the opportunity to purchase the water for \$5.00 per thousand. It is not now uncommon to see such offers in the range of \$3.50 to \$5.00 per 1,000 in Kansas. For its evaluation, the utility projected what effect purchasing such water would have had on the recent year's operations.

As can be seen in Column 7, item 26, the net revenue would have been decreased to a loss of \$115,092 without a rate increase. Column 7 shows just above item 9 the \$124,345 variable expense for purchasing water. Also, note that the variable expenses of the water treatment plant in Column 7 items 13 and 18 were eliminated due to purchasing water.

In order to recover only the increased expense of purchasing water, the existing utility customer water rate of \$4.37 per 1,000 gallons would have to have been increased to \$11.62 per thousand gallons! This still would have resulted in a net revenue loss of \$7,354.49.

Of course, this was a "static", hypothetical analysis because it is most likely that the increase of the unit water sales rate to \$11.62 would have resulted in less water sales as customers would try to save money due to the rate increase. Thus, the rate might need to be further increased to makeup for the reduced number of gallons sold.

Because of the significant increase in water rates that would have been needed, this utility decided not to purchase water. The utility still has the challenge to keep expenses within the revenues generated; it has the responsibility to increase the rates if needed to adequately fund the operations.

Observations

There are several good points that are shown by this utility's example and that are common to many small water suppliers in Kansas. First, unbilled water loss has an effect on the expenses. However, the significance in terms of money varies from "somewhat" when only chlorination of well water are the variable expenses (less the 15¢ per 1,000 gallons); to "significant" when a treatment plant is the variable expense (\$1.00 - \$1.50 per 1,000 gallons); to "WOW" when purchasing water at \$3.50 - \$5.00 per 1,000 gallons. The actual savings vary with the amount of water loss reduction and the variable expense of the water. City councils and RWD boards, their water system operators and other staff should evaluate their own system to determine the "significance" and amount of the financial loss and possible savings in these situations.

It was a bad year for any utility in that the expenses were greater than the

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revenue. However, this was due to unexpected events that might not reoccur. Also, this utility had cash and a reserve fund that was a little greater than 75 percent of the year's expenses. If water sales stay steady or preferably increase somewhat, and unexpected, un-budgeted expenses do not occur, a rate increase may not be needed.

Another view of this utility is that a modest 5 percent to 10 percent increase in the water rates would give a more "comfortable" budget in that there would be some profit if unexpected events do not occur and that would increase the reserve fund to closer to one year's revenue and expense amounts. It has been several years since the last increase, so really a 10 percent increase over the last four years is a modest 2.5 percent increase per year.

In conclusion, for many cities and RWDs in Kansas, the water sales have only held steady or have decreased during the last decade. There are not so

many water suppliers with increasing sales. Also, the costs of personnel and benefits, chemicals, fuel, electrical power, and equipment are increasing. If the revenue increases do not cover the expenses, then a rate increase would be the next consideration.

A message to boards/councils, operators and staff

The Kansas Rural Water Association provides scores of training sessions throughout the year, and hosts one of the best conferences in the country. I encourage readers to check out the training calendar online at www.krwa.net. I also encourage operators and other staff to attend sessions that address water rates. Typically, the operators and staff know both the utility's infrastructure needs as well as financial needs. KRWA encourages administrators, managers, operators and office staff to attend sessions with board/council members. Let's pull together. That's a "Recipe For Success"!

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