BEST MANAGEMENT PRACTICE – CONSERVATION PRICING

Rate Setting, Metering, and Billing Considerations

to Encourage Water Conservation

Background

Conservation rates and associated metering and billing practices are activities employed by water utilities with the intent of providing a price signal to reduce or minimize wasteful use of water resources and to reduce future costs to customers. Fundamental to this strategy is the idea that potable water is an extremely valuable and, in some cases, limited resource that should be protected and sustained over time.

The objective of this Best Management Practice (BMP)[1] is to provide a description of pricing practices available to water utilities to encourage consumers to minimize the wasteful or unnecessary consumption of potable water. Rate setting is one of many measures or practices that can be employed to encourage water conservation; however, rate changes should be viewed in the overall context of a water system's plan to integrate both supply and demand side management techniques.

While the practices and considerations outlined here will work for many water utilities, they will not necessarily be optimal or appropriate for every water utility under all circumstances. While conservation pricing may lead to reduction in total revenues, this is not always the case. Furthermore, even when reduced revenues will be a result of implementing conservation pricing, this effect can be managed or mitigated.

Basic Principles of Rate Setting

The rates and charges applicable to each customer class should reflect, to the extent practical, the cost of serving similar customers. Customers in the same general class (industrial, commercial, light commercial, residential, etc.) should have similar rates, charges and other conditions of service. The utility's full cost of providing adequate and sustainable service, including the cost of all infrastructure needs, should be recovered through user rates and charges. In some jurisdictions this is referred to as "full cost pricing."

[1] This is one in a series of Best Management Practices (BMP) prepared by Committees of the New England Water Works Association (NEWWA). This BMP was jointly prepared by the Financial Management and Conservation Committees of the NEWWA. It was endorsed by the NEWWA's Board of Directors on July 28, 2009.

General Types of Conservation Rates and Pricing Signals

There are four basic types of rates or rate structure that are considered to be conservation rates. These are: Uniform Rates, Increasing Block Rates, Irrigation Rates, and Seasonal Rates. Each is described below. (Note: refer to the Addendum for explanations of two other types of rate structures, flat rates and decreasing block rates, which are not considered to be conservation rates.)

Uniform Rates – A uniform rate structure is one that applies a constant rate per unit of usage for all levels of use. All customers in the same class are charged the same unit rate for each and every unit of consumption (gallon, cubic feet, liter, etc.). For example, if the unit rate is $5.00 per 1,000 gallons of consumption, any customer in the same rate class would be charged $50.00 if they consumed 10,000 gallons ($5.00 per unit times 10 units), or $100.00 if they consumed 20,000 gallons of water ($5.00 per unit times 20 units). The consumption charge is computed by multiplying the unit rate times the number of units consumed.

A uniform rate is different from a flat rate (or fee) where a fixed amount is charged independent of the volume of use. A uniform rate structure can provide an economic signal to conserve if it is recovering a relatively high cost of service. A uniform rate has no quantity discounts for large or excessive uses of water.

Increasing Block Rates – An increasing (or inclining) block rate is one where progressively higher quantities of usage are charged at higher unit rates. An increasing block rate is different from a uniform rate structure in that the unit rate for consumption changes (increases) one or more times at higher levels of consumption. Higher levels of consumption are separated into consumption blocks (steps/tiers). Each block of consumption is billed at a different (higher) unit rate as block levels increase. There can be as few as 2 blocks or as many as desired, but 3 to 5 is generally the maximum used. For example, a 3 block increasing block structure would look like the following (1 TG = 1,000 gallons):

Block 1 (0 to 20 TG) per Quarter	First 20,000 gallons----------$2.50 per TG
Block 2 (20 to 200 TG) per Quarter	Next 180,000 gallons----------$4.00 per TG
Block 3 (all above 200 TG) per Quarter	All Use Above 200,000 gallons---------$6.00 per TG

The unit rates for each block are applied to all units of consumption within that block. Thus, this structure can be viewed as three separate uniform block rates with each consumption block having a different unit rate. The block ranges and the unit rates for each block are variables that must be determined by each water utility based on their particular circumstances.

Increasing block rates are considered to be conservation rates if properly developed and applied. A simple schedule of increasing block rates that is applied to all customers does not necessarily provide a conservation incentive and, if not properly designed, could provide disincentives. This may be the case if the blocks are such that the result is to only penalize large non-residential customers and lower the charges to residential customers that use large quantities for irrigation. Different increasing block rate schedules for various classes of customers should be considered in order to reflect different demand and usage characteristics of the different classes. This may include different rate blocks as well as different unit rates for two or more classes.

Irrigation Rates – For the vast majority of water systems, the summer season demand is the highest demand during the year. To encourage conservation, customers with separate irrigation meters (sometimes referred to as "deduct meters") should be charged higher block rates for that water use. Irrigation rates reflect the higher cost of providing water during peak demand periods. Additionally, the costs associated with providing, maintaining and reading the extra irrigation meter should be recovered from those customers.

Irrigation rates usually consist of a uniform consumption rate and a fixed charge ("meter fee"). The irrigation consumption rate is usually equal to or somewhat higher than the highest unit rate used for general water service. (Irrigation rates lower than general rates do not provide a conservation incentive.) The fixed charge or "meter fee" is a fixed amount per billing period regardless of the associated consumption level. Again, the fixed charge is generally designed to recover those costs associated with providing maintaining and reading the extra irrigation meter. In some cases the fixed charge is either waived or incorporated into the consumption charge.

Seasonal Rates – Seasonal rate structures typically charge customers a lower water rate in the winter when water demand is usually lower and a significantly higher rate in the summer when demand is higher. All unit rates or rate blocks by class can be set so that they reflect higher summer demands for each customer class. The simplest form of a seasonal rate is a surcharge added to all block rates that encompass discretionary use for residential customers. For example, a surcharge of perhaps $2.00 per 1,000 gallons may be added to all consumption levels above 5,000 gallons per month during the months of June, July and August. There are many variations possible for seasonal rates, but they generally fall into one of the following three forms:

1. Higher rates for all use during peak demand months.
2. Increasing block rates that set higher rates on all use above normal (or typical winter period) use for residential customers.
3. Rates that compare each customer's summer use to their prior winter month's use and charges each customer for the excess summer use (the summer use minus the winter use) at a higher unit rate.

Considerations before Implementing a Major Change in Rate Structure

Before implementing conservation pricing, a water utility should thoroughly review its current practices and its long-term goals. Below is a list of just a few important topics to be considered in order to successfully transition to conservation pricing.

1. **Metering and Billing Practices** - Before conservation rates are adopted a careful evaluation of current billing and metering practices should be performed. Such rate structures are relatively ineffective, unless meters can be read and billed on a monthly basis. Customers are more likely to respond to calls for water conservation if they can easily see the savings from adjusting their consumption level or usage pattern. Annual, semi-annual and quarterly billing, at best only provide a generalized and "delayed" price signal. Monthly billing is therefore the preferred billing cycle. Also, to the extent possible, bills should reflect actual consumption and rely as little as possible on estimated consumption from historical records. Useful information, such as the customer's usage during prior billing periods (preferably going back a full year) should be prominently listed on all bills.

2. **Effects on Essential Water Use** - A key consideration in designing conservation rates that will be approved by governing boards is to insure that as little as possible of the increase is applied to consumption levels required for health and sanitation (essential or non discretionary use) for residential customers. Such usage is relatively insensitive to price changes, and most customers view this level of use as essential to life, and therefore, should not be priced to discourage such use.

3. **Rate Stabilization Reserve Account** - A utility considering a major change in rate structure would be well advised to build up a rate stabilization reserve account before undertaking the rate structure change. Changes to operating revenue from major rate structure changes can be very difficult to predict in advance. A conservation rate structure charges higher rates for discretionary uses, which may result in significant fluctuations in revenue. Maintaining an adequate rate stabilization reserve is critical to ensure that sufficient funds are available to pay for all ongoing costs.

4. **Administrative Approval/Acceptance** – Rate structure changes usually require a formal acceptance or approval from the utility's governing body (Board of Water Commissioners or Board of Selectmen, etc.) It is a very important and necessary step to inform and educate the governing body on conservation rates, including purpose, benefits, how they will be applied, how they will affect billing, etc.

5. **Customer Notification/Education** – Once accepted by the governing body, major rate structure changes and the reason for the changes should be announced to customers well in advance of implementation. Customers should be fully educated on how new rates will be applied, how they differ from the rates they replace, and the range of bill impacts that can be expected. If the utility is concerned that the proposed rate structure change would seriously impact large business customers, or the community's economic development, consideration should be given to phasing-in such changes.

Reference(s): AWWA Manual of Water Supply Practices – M1, Fifth Edition, Principles of Water Rates, Fees, and Charges, 2000, American Water Works Association, Denver, Colorado

Addendum

In addition to the types of rates described in this BMP, there are two other basic types of rates that were widely used in the past, but are relatively rare today largely because they do not encourage conservation. These are Flat Rates (or fixed fee) and Decreasing Block Rates, and each is described below.

Flat Rates – Flat rates charge each customer within the same class the same fixed amount regardless of how much water a customer consumes. For example, a flat rate structure to a residential customer could be a charge of $75.00 per quarter whether they consumed 10,000 gallons or 50,000 gallons over the quarter. A bill for $75.00 would be charged to all customers in the same class every 3 months, regardless of usage. Such rate structures were fairly common in the past, but are rarely used today. Systems that do not have meters have to use flat fees or rely on another type of fixed charge that has some correlation with average consumption (i.e., fixed charge based on number of fixtures).

Decreasing Block Rates – A decreasing (or declining) block rate is one where progressively higher quantities of usage are charged at lower unit rates. A decreasing block rate is different from a uniform rate structure in that the unit rate for consumption changes (decreases) one or more times at higher levels of consumption. Higher levels of consumption are separated into consumption blocks (steps/tiers). Each block of consumption is billed at a different (lower) unit rate as block levels increase. There can be as few as 2 blocks or as many as desired, but 3 to 5 is generally the maximum used. For example, a 3 block decreasing block structure would look like the following (1 TG = 1,000 gallons):

Block 1 (0 to 20 TG) per Quarter	First 20,000 gallons----------$5.00 per TG
Block 2 (20 to 200 TG) per Quarter	Next 180,000 gallons----------$3.50 per TG
Block 3 (all above 200 TG) per Quarter	All Use Above 200,000 gallons---------$2.00 per TG

The unit rates for each block are applied to all units of consumption within that block. Thus, this structure can be viewed as three separate uniform block rates with each consumption block having a different unit rate. The block ranges and the unit rates for each block are variables that must be determined by each water utility based on their particular circumstances.

Flat Rates and Decreasing Block Rates do not encourage conservation because the cost of water does not increase with increased usage. In fact, Flat Rates and Decreasing Block Rates tend to lead to wasteful and unnecessary use of potable water.