

## Water Conservation Through Rate Planning

*by Edward Cebron*

From recycling to energy efficiency to water savings, conservation is recognized as a fundamental technique available to meet our growing resource needs. Increasingly, water rights and regulation laws are requiring more efficient and conservative water use as an essential part of resource and utility planning.

All conservation rate or user fee concepts work on the assumption that high utility bills can influence behavior. The basic approach to conservation ratemaking is to discourage waste and to provide price incentives for conservative behavior. Increased water rates can stimulate conservation by sending clear signals to customers concerning their usage patterns, particularly since the water bill is often the sole communication between the utility and the customer. Sewer rates can provide similar incentives.

High usage periods are generally targeted since these offer the most opportunity for reduction. A structure resulting in extremely high summer water bills may stimulate reduced or more efficient water use for lawn watering or car washing. To remain revenue neutral, such a structure would also result in lower winter bills, when usage is usually limited to ordinary indoor uses.

Conservation rates also help maximize economic efficiency. This is related to the concept of “marginal cost pricing,” where water is priced so that incremental use is charged at the replacement cost of capacity. This results in charging the full economic cost for an additional unit of use, while providing a savings equal to the full economic cost for a reduction in use.

### **Types of Conservation Rates**

How do we achieve conservation pricing in a rate structure? There are several standard approaches, which differ in complexity and effectiveness:

1. Seasonal Rates – Seasonal water rates charge more in summer than in winter. This is based on the premise that summertime outdoor use is a key factor in overall system planning and on the observation that this use is discretionary and often wasteful. The advantages of seasonal rates are that they can be easily implemented and are practical, even on unmetered systems. For some billing systems, season rates mean seasonal system changes, increasing the chance for error.

2. Increasing Block Rates – Increasing or inverted block rates link blocks of usage with progressively higher volume charges. A single year-round rate structure is used. This can influence usage year-round, but has its greatest effect on peak season use. The increasing block structure rewards customers whose consumption does not increase in the summer, while a seasonal rate penalizes all summertime use.
3. Marginal Cost Rates – This rate structure prices water at the estimated cost of new capacity. To be revenue-neutral, this structure often has minimal fixed charges. The effect is similar to an increasing block structure, except that all water usage is valued equally within each block rate. This structure can result in highly irregular revenues as consumption changes.
4. Volume-Based Sewer Rates – Sewer rates can be based on volumes for all customers. The effect is to increase the sensitivity of the utility bill as a whole to water usage. This can be accomplished in several ways. Most commonly, residential customers are billed based on their average winter use, which most closely reflects sewer volumes. This results in a flat charge during the year, based on individual usage habits. Another approach is a truly variable sewer bill. In this approach a ceiling is placed on summer billings. Any water usage above the ceiling is usually for irrigation and other outdoor uses.
5. Pattern-Based Rates – A field of growing interest focuses on costs related to patterns of usage and rates structured to address those patterns. The intent is to focus rate incentives on altering the nature of use as well as the total amount of water used. Examples would be customized block rates or surcharge/refund mechanisms based on annual patterns.

### **Advantages of Conservation Rates**

The implementation of conservation rates can achieve a number of utility objectives:

- Capital Requirements – By reducing usage, the construction of new supply facilities might be delayed. By reducing peaking factors, demands on the existing systems are often reduced.
- Efficient Water Use – By discouraging wasteful use, greater efficiency is attained. This is becoming an increasingly important factor in the planning of new supply facilities.
- Perception of Sensitivity – By charging more for high usage, rates for low usage levels can be reduced. This allows a lower “lifeline” rate for senior citizen households, smaller family units and conscientious water users in general.
- Appearance of Fairness – Conservation rates are often perceived as rewarding conservative water users and punishing the wasteful user in appropriate ways. They also put greater cost control in the hands of the consumer. This often results in favorable public reaction to the concept of conservation rates.

## The Disadvantages of Conservation Rates

Conservation rate structures also have some significant disadvantages:

- Unstable Revenues – A high level of community awareness can lead to extensive conservation. This reduced use can cause revenue shortfalls. External factors, such as wet years or mandatory reductions can also cause severe revenue problems. Higher levels of operating reserves are appropriate.
- Adverse Public Response – Since seasonal rates target high use periods, they result in increased customer bills during the summer months when bills are already higher. While this is an intended outcome, it results in an increase in complaints and in customer ill will.
- Impact on Large Families – Larger households naturally use more water. Conservation rates must be carefully structured to avoid penalizing such customers.
- Timing – In many systems, residences are billed bimonthly. Thus, the first price signal may arrive after the heavy irrigation season is over, resulting in a greater effect only in the second year of a conservation rate. This occurs because the signal was too late to affect usage in the first year. The phased public relations (PR) program should be implemented before this peak period occurs.

An additional consideration the applicability of conservation rates to commercial customers. Commercial and industrial usage patterns are far different from residential, and warrant separate consideration. The goal is to encourage efficient water usage, and this is not necessarily achieved by charging larger users a higher rate based, for example, on residential usage patterns.

### Public Awareness

It is essential that customers understand the relationship between higher utility bills and water conservation and that they obtain this information in a timely fashion. Since the billing cycle may not be an adequate information source, the Utility should plan a public information program to highlight the need for conservation in general and to spotlight the opportunities that customers have to realize dramatic savings in their utility bills. This type of program can result in a positive attitude toward conservation. In order to be fair to customers, capture a reasonable revenue stream and conserve resources, Water Utilities need to be innovative in their approach to rate planning.

First Published, July 1992

Last Reviewed, May 2000

For more information on this subject, send an email to: [edc@fcsgroup.com](mailto:edc@fcsgroup.com).

