

## SECTION XI

### POLICY IMPLICATIONS AND SUGGESTIONS

Policy implications are derived from our trend and demand analyses. Our discussion focuses on three policy options which have been adopted by Artesian Water Company, Inc.: a conservation rate, education, and the delivery of conservation kits. To successfully promote a water conservation program in New Castle County, we recommend that water conservation programs be designed which take into account empirical results founded on water users' behaviors in response to program options. The findings below can be useful as policy guidelines.

The estimated impacts of Artesian's DSM measures were based on five years of experience (1992-97), and the results have been persistent. However, there is a need to examine whether the level of information perceived by the sample customers has been changed since 1992, and whether the customers who received conservation devices from Artesian have installed and still use them (also whether they added new water-conserving devices from Artesian since the recent survey of 1994). For this purpose, a simple survey can be conducted by Artesian on the basis of a questionnaire developed by the Center for Energy and Environmental Policy.

#### **XI - 1. Enhancement of Information Quality**

##### *Findings*

- Almost 70 percent of the sample households of Artesian customers are aware that their water prices increased on September 1, 1992. However, the respondents seem to be unsure of the exact nature of the price increases. The proportion of those who responded that prices during periods of high use are "higher", "about the same", or "not sure" compared to periods of low use is about the same (approximately 30% each).
- A little over half of Artesian's customers (56%) are aware of the free water conservation devices offered by Artesian. Only 13%, however, actually obtained the devices.
- Three-quarters of the sample households are aware of Artesian's summertime sprinkling regulations, but less than 2% indicate that they have observed these regulations.
- Artesian is buying water from Wilmington Suburban Corporation and Chester Water Authority in Pennsylvania, as well as the City of Wilmington and the City of New Castle, but almost half of the surveyed customers (45%) indicated that they believe

there are currently no problems with water supply.

- Our demand analysis and statistical tests (two-sample difference of means t-test) indicate that Artesian's information campaign through the Company's bill inserts and pamphlets (INFORM) have had some water conservation impact. Even though INFORM is not statistically significant in the demand analysis, the estimated coefficient has an expected negative sign. In the two-sample difference of means test, those customers who received water conservation-related information from Artesian tended to reduce water use more so than those who did not (a statistically significant result with  $t=2.94$ ).

Our demand and statistical tests indicate that Artesian's information campaigns through the Company's bill inserts and pamphlets (INFORM) have had some water conservation impact. Even though INFORM was not statistically significant except for the 1992-95 equation. Its influence becomes stronger in 1995 but gets weaker after 1995. The estimated coefficients had negative signs, indicating that those customers who received and remembered water conservation-related information supplied by Artesian tended to reduce their consumption. Based on the 1992-95 equation, the magnitude of reduction by those informed customers during the summer months between 1992 and 1995 was about 9% compared to those who were not.

Water utilities in collaboration with state and local governments can play an active role in the dissemination of quality information on the water supply situation and conservation needs. From a policy standpoint, the amount of information the residents have is not that important. The most critical matter is to get them to take the message seriously enough to change their behavior. The information should be clear and understandable to residents and motivate them to take actual conservation measures. The information campaign should also be persistent to be most effective. Billings and Day indicate that "the effect of publicity exists only as long as the publicity continues" (1989: 63)

## **XI - 2. Delivery of Conservation Devices**

### *Findings*

- Whereas about 60% of the sample households installed water conservation fixtures, only 13% obtained the devices from Artesian prior to the Consumer Conservation Program (CCP) jointly sponsored by the State and Artesian. The remaining 47% of customers purchased the devices themselves.
- The most popular water conservation devices installed by customers were low-flow showerheads (36%), faucet restrictors (23%) and ultra low-consumption toilets (21%).
- Around 60% of sample households were very supportive or somewhat supportive of conservation devices supplied by water companies for a fee.
- Those customers who received conservation devices provided by Artesian, whether prior to CCP (KITS: 86 out of 634) or as part of CCP (DEVICES: 52 out of 634), exhibited significantly lower growth rates in water consumption than those who did not. The estimated coefficients of KITS and DEVICES were negative and statistically significant in the demand analysis.

Our analyses and engineering estimates (Postel, 1986; and Vickers, 1989, 1991 and 1993) generally indicate that efficient water fixtures can significantly reduce water consumption. Those customers who received conservation kits either prior to Consumer Conservation Program (CCP) or as part of CCP had a significant reduction in water consumption (16% in the 1992-97 equation). However, because the percentage of customers using Artesian's conservation devices is small,<sup>9</sup> Artesian might consider adopting combined strategies of information and pricing (including utility rebate programs) to promote installation of conservation devices by customers.

A high-penetration program could be adopted to increase participation in the delivery of water conservation devices whether for free or for a fee. One example from an electric utility program is introduced here. The Santa Monica Energy Fitness Program used new techniques designed to increase participation in the Residential Conservation Service (RCS) Program by utility customers. The technique was to complete a direct-service-home-energy audit, which included the actual on-site installation of energy saving devices in the participant's home (Egel, 1986). This type of energy program could clearly be applied to water conservation as well, especially since several

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<sup>9</sup> The policy of free distribution of conservation kits by Artesian in collaboration with the State as part of CCP had limited reach.

of the Santa Monica measures were for hot water savings.<sup>10</sup> This approach resulted in participation among the highest ever achieved by an RCS Program. Since program costs and energy savings per household were comparable to those associated with most traditional RCS Programs, far more total conservation was achieved at similar cost per unit saved.

### **XI - 3. Adoption of Conservation-Oriented Pricing**

#### *Findings*

- Three-quarters of the sample households regularly check their water bills to see if they are increasing or decreasing. When their bills increase, households report active efforts to curtail water consumption indoors and outdoors, identify leaks or changed usage behavior of family members, and contact the company to register their complaints. Only 21% indicate that they take no action in the face of increased bills.
- Although 76% of the respondents do not support a policy option to have water prices increased to encourage greater water conservation per se, 63% are supportive of a policy designed to increase higher summer prices for large water users. Only 19% responded that they would not support such a policy. More than 72% of the small consumption group are supportive, while 62% of the large consumption group are in agreement with a policy of higher summer prices.
- Large water users in summer tend to have characteristics which are more conducive to a seasonal pricing than small users: they are more price sensitive; are younger with larger family size; belong to a higher income category; have more water-consuming appliances with higher frequency and longer duration of usages; and water their lawn and/or garden(s) and wash their cars more frequently and longer.
- Our demand analysis based on Artesian rates during 1992-97 showed that pricing is the most significant policy tool to affect water conservation. The elasticity of price on water demand is statistically significant (-0.533).

Pricing policy is essential for ensuring that water utilities and customers alike weigh efficiency alternatives properly in their water supply and demand decisions. Our survey indicates that residential customers of Artesian are sensitive to water prices (price elasticity of -0.45 in the 1992-97 equation). The most serious water supply problem faced by water utilities (including

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<sup>10</sup> Santa Monica is a liberal, environmentally-oriented community, quite different from New Castle County. However, the penetration technique undertaken by its Energy Fitness Program did not rely on these characteristics and is considered to be generally applicable to communities regardless of political or social beliefs.

Artesian) is peak summer demand when capacity is limited. In this case, utilities satisfy demand through such options as purchasing expensive water from other utilities, reactivating old wells currently not in use, or expanding storage capacities. These supply-side actions impose high costs on the utilities (higher marginal costs). Consumers who are the principal source of peak demand should shoulder higher costs. Seasonal pricing, which is generally supported by Delaware residents, reflects these higher costs.

Since pricing is a significant policy variable influencing water conservation, Artesian should continue considering pricing as a water DSM alternative to conventional supply options. To be most effective, pricing structure should be designed in such a way that discretionary water users in the summer months are given signals to reduce consumption.

