

SECTION I

INTRODUCTION

The previous four studies conducted in 1992 through 1997 by the Center for Energy and Environmental Policy (CEEP) of the University of Delaware indicated that the demand-side management (DSM) programs undertaken by Artesian Water Company, Inc. influenced water conservation during the summer months.⁴ The DSM measures included in these conservation impact studies were conservation-oriented rates, information campaigns and the delivery of conservation kits.

These studies and the current 1998 study (the 1992-97 panel study) indicated that the most influential water conservation option was a pricing policy, ranging from -0.51 to -0.70 in terms of elasticity. The next most influential policy option was the delivery of conservation devices. Those who received the devices provided by Artesian reduced their consumption by 10% to 20% compared to those who did not receive the devices. Information campaigns had positive implications for conservation (3 to 9%), but were not statistically significant, except for the 1992-95 equation (see Table 14).

To successfully promote water conservation, DSM programs should be designed to take into account empirical results founded on consumers' behavioral responses to program options. In this sense, the findings by CEEP, which were based on information from individual customers, can be useful as water conservation policy guidelines. It is important, however, to recognize that the estimated impacts of Artesian's DSM measures were only for the summer, not the year around because they were based on demand equations constructed from the summer month experiences (third quarter) during the study period (1992-97).⁵

The purpose of the current follow-up 1992-97 panel study is to evaluate the persistence of the impacts of Artesian's DSM measures on residential water conservation. This research adopts a panel study approach by adding 1997 data to the existing 1992-96 data set (resulting in the same number of cases for 1992 through 1997). In addition, the 1992-94 panel study (reported in March 1996) consulted the results of a simplified interview which was conducted in November of 1994 to identify any changes in household and housing characteristics including appliance holdings since the last interview in early 1993. Furthermore,

⁴ Two previous studies, entitled *Water Conservation Impact Study: Conservation Implications of Residential Water Pricing and Demand-Side Management Programs* (1994) and *Residential Water Conservation Impact Panel Study: Persistence of Conservation Performances of Water Pricing and Demand-Side Management Programs* (1996), were sponsored by the Department of Natural Resources and Environmental Control, State of Delaware in cooperation with Artesian Water Company, Inc.

⁵ It should be noted that the 1994 data were collected on a quarterly basis (third quarter) rather than a monthly basis (as in other years of the study period).

the current study includes information on lot size and the assessed property value for the sample households. This information was gathered in 1995 from the New Castle County's Recorder of Deeds Office.

This report describes the results of the current project conducted in 1998 and is composed of the following ten sections:

- ? A review of the general characteristics of Artesian's demand-side management programs (Section II);
- ? A statement of objectives and methodology of Artesian water conservation impact study (Section III);
- ? A customer profile of sample households by consumption groups (Section IV);
- ? An analysis of the representativeness of the current sample (Section V);
- ? A trend analysis of water consumption between 'the conservation group' and 'the non-conservation group' (Section VI);
- ? A review of the characteristics of Artesian's residential peak water consumption (Section VII);
- ? A preliminary tests of water conservation impacts based on correlation and t-test (Section VIII);
- ? A cross-sectional regression analysis to measure the impact of conservation performances (Section IX); and
- ? A panel study to measure the persistence of conservation performances (Section X); and
- ? A development of policy recommendations on the basis of the findings of the above (Section XI).