DW 01-253

Investigation into Water Conservation

REPORT

Prepared by Staff of the Public Utilities Commission

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I. BACKGROUND AND INTRODUCTION

The Commission created Docket No. DW 01-253 in response to recommendations contained in a report authored by the Public Utilities Commission (Commission) and the Department of Environmental Services (DES), entitled: *Regulatory Barriers to Water Supply Regional Cooperation and Conservation in New Hampshire.* This report was in response to Chapter 64, Laws of 2000 which required the Commission and DES to conduct a study of regulatory structures which encourage or discourage regional cooperation in drinking water resource management and water conservation. In the report, DES and the Commission assessed improvements to state policies to promote consideration of regional approaches and water conservation by state water suppliers.

Recommendation 13 of the report stated:

> … [the]PUC should convene a proceeding open to all water utilities and other interested persons, to consider water utility ratemaking structures, rate design approaches, establishing a pre-approved list of water conservation activities that are eligible for rate reimbursement, and establishing efficiency programs, such as PAYS or other such assistance to consumers and develop policy recommendations for implementation, at least on a pilot basis, by December 31, 2002.

The Commission issued an Order of Notice on December 31, 2001 and set a technical session for January 30, 2002 for all interested persons to attend and discuss the issues raised in Recommendation 13. The Commission did not expand the docket to a discussion on whether public policy should mandate conservation. This public policy debate had already occurred and it is replete in New Hampshire statutes that water of the state is a limited and precious public resource that should be protected and conserved.[1] The goal of this proceeding was to address ways water utilities could incorporate that public policy through measures identified in Recommendation 13 and to suggest legislative changes where necessary.[2]

This is not the first time the Commission has investigated demand-side management measures. In Docket No. 93-029, the Commission ordered New Hampshire's four largest water companies to file least cost integrated planning documents including a description of how the utility incorporates conservation or demand-side management measures in to its planning. Integrated resource planning is

[1] N.H. Rev. Stat. Ann. § 481:1 (1935); N.H. Rev. Stat. Ann. § 482:1 (1989)

[2] Rep. Michael W. Downing testified before the Resources, Recreation, and Development that "[t]his bill directs DES and the PUC to prepare a report as to whether regulatory structures for water utilities encourage or discourage regional cooperation for water resource management, and water conservation by June 30, 2001. The report, hopefully, will evaluate existing regulatory practices in order to make recommendations that could be the subject of future legislation." House Journal, March 29, 2000, at 485. This objective has been carried through the Commission's investigation pursuant to Recommendation 13.

advocated by numerous other public utilities commissions.[3] Over a four-year period, the utilities filed their reports. The Commission is now in a position to review the results and make recommends on future resource planning reports.[4]

During the course of 2002, interested persons met in three additional technical sessions and offered their input and helped Staff form this report. Participants reported the single largest contributor to water usage spikes is summer lawn watering. To illustrate the adverse impact of summer lawn watering, Hampton Water Works stated their moratorium on new hookups was due to a roughly six week period during the summer when lawn watering taxes their system. These short-lived usage spikes drive the design needs of the overall system. The recent drought conditions in New Hampshire and other parts of the United States highlighted the need to address these spikes.

Although not a participant in the technical sessions, the Town of Bedford through its Town manager Keith Hickey, submitted a letter to Staff with concerns about irrigating lawns, and the problems experienced by Pennichuck Water Works, Inc., the franchise holder for most of Bedford, in controlling such usage. Bedford related that severe water shortages had been occurring at the Powder Hill subdivision, requiring Pennichuck to invest in substantial additional facilities including an interconnection with Manchester Water Works of over two miles in order to serve that area. The Town also indicated that these severe summer shortages have led to a wide-spread misconception by Bedford residents that community water systems are unreliable, and that the Town is "running out of water". The Town further suggested that there are simply no effective means for Pennichuck to enforce water conservation measures.

Enforcement during periods of drought garnered much attention at the technical sessions. Some participants favored municipal ordinances which would put the burden of enforcing watering bans during times of drought on local police. The reasoning for this would be based on the concept that conservation of water during droughts or limited supplies is a public safety issue. A municipal ordinance would thus make local municipal police power methods of enforcing water conservation measures available to both municipal and privately-held utilities. Other participants pointed out their understanding that police may be unable to assume this enforcement function. Other pressing police duties cause water conservation enforcement to be a low priority.

Participants discussed the use of rate structures to achieve water conservation. The utilities felt that wholesale changes to their rate structure would introduce revenue instability concerns. These same water utilities, however, believed seasonal rates would be the most direct while minimizing revenue instability. Seasonal rates would promote conservation among customers while being short enough in duration to minimize the potential of lost revenues due to lower usage.

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[3] *Revenue Effects of Water Conservation and Conservation Pricing: Issues and Practices*, The National Regulatory Research Institute, Columbus, OH, September 1994, at 23.

[4] 81 NH PUC 1037 (1996)

Metering and billing issues were raised. Participants noted that customer response to higher rates may be dampened if a utility bills quarterly. In this case, a customer could see the higher seasonal rate too late to modify their usage. Another metering concern raised was how to address multiple units served off of one meter. The education component associated with customers observing price increases in their water bill is diminished when the end user is not a direct customer. Bill inserts during the spring months, an active education campaign, or switching to monthly billing could overcome these concerns. Utilities remain hesitant, however, to spend money on education campaigns or hiring extra staff until those expenditures are pre-approved by the Commission.

Participants in the technical sessions clearly expressed their desire that any demand-side management programs initiated by this docket be implemented on a state wide basis. An issue that may present a possible hurdle to that end is that New Hampshire relies heavily on private wells. It makes sense that any efforts to conserve water resources in any given region include private wells within that region. Parties raised the fact that some customers may be subject to water use restrictions during a drought, but that a neighbor on a private well, withdrawing from the same aquifers, may still be watering their lawn. This demonstrates the limitations of reaching all users in a region, including the private wells, through water utility programs. This inequity, however, was seen as a secondary issue to address after initial programs are put in place.

II. WATER UTILITY RATE STRUCTURES

A. Relationship Between Water Use and Water Rates

Implicit in Recommendation 13 is that a relationship exists between water usage and its cost. Namely, that as water becomes more expensive, usage declines, and conservation is achieved. This relationship was examined in a report by the National Regulatory Research Institute (NRRI) and American Water Works Association Research Foundation (AWWARF) entitled *Revenue effects of Water Conservation and Conservation Pricing: Issues and Practices*, dated September 1994 (NRRI Report). This report surveyed forty-five state regulatory commissions and reviewed the effects of water conservation, through pricing practices, rate design, and pricing strategies, and the consequential results to the revenues of a water utility. The report found evidence, to some extent, that increasing the price of water will result in a reduction in demand.

Subsequent to the 1994 NRRI Report, the Florida Public Service Commission conducted a follow-up survey and reported the results in a report entitled *Conservation-Oriented Rate Structures for Water Utilities*, September 1997 (Florida Report). Thirty of the forty-six state commissions surveyed responded. Four states indicated they had a conservation pricing policy and eleven states indicated the use of inverted block rates, six states reported the use of seasonal rates, and three states mentioned the use of excess-use

rates to curb demand.[5] Thirteen states did not have conservation pricing due to either a lack of jurisdiction or lack of water supply problems. In examining the relationship between price and use, Florida found an average decrease of 44.79 percent among water companies moving from a flat rate to a gallonage charge.[6] In comparing changes to inclining block rates, the Florida Commission found a decrease of up to 13 percent.[7] Breaking this down further, the Florida Commission compared the block increases and found cases with price increase of 50 percent, 75 percent, and 85 percent resulted in 8 percent, 13 percent, and 24 percent reductions in usage respectively.[8] This data confirmed a relationship exists between price and usage.

The Florida Commission also developed data concerning the affect of price increases in general along income categories. In a study performed by the Southwest Florida Water Management District, a positive correlation existed between low average consumption, lower property values, and lower income levels. Low income customers reduced discretionary uses and lowered their water consumption more than the affluent customers.[9] Data showing low income households being more responsive to price signals is not surprising. Higher income households have more discretionary income than low income households. This information will be useful in setting appropriate rate blocks and summer rates. It could help justify higher rate increases in top blocks of an inclining block rate structure to curb, in particular, summer lawn watering in affluent neighborhoods.

Post-switch bill and use analyses by *An Evaluation of Conservation Rate Structures,* July 1, 1998, by Hagler Bailly (Hagler Bailly Report) indicated residential and non-residential average monthly bills and average bills during the highest-use month increased. The average monthly residential bill increased 15% while the non-residential bills went up 9%. The average bill during the highest-use month increased 31% for residential and 26% for non-residential customers. The survey found average residential usage increased, however use during the peak month declined 33%. Hagler Bailly saw a 34% decline among non-residential customers. In addition to the inclining rate structure, the utilities' fixed charges represented 29% of revenue, compared to 37%, the average of the sample group.

Since the 1994 NRRI Report, other reports evaluating the relationship between water use and water rates have found relationships exist, although they may vary by customer group. The elasticity of demand for water can vary by customer class and ability to pay, season, type of water use, and current level of rates. Florida Report at 9. For this reason, a rate structure will be more successful if it is designed to target the

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[5] For example, R.I. Gen. Laws § 46-15.4-6.(b) (1991) Fees, rates and charges. "[a]ll rates and charges made by water suppliers which decline as quantity used increases are hereby declared to be no longer conducive to sound water supply management designed to properly conserve, develop, utilize, and protect this finite natural resource."
[6] Florida Report at 39.
[7] *Id.* at 41.
[8] *Id.* at 42.
[9] *Id.*

portions of the demand which are more price elastic, such as lawn watering, and take in to account other variables such as rising customer income levels. Florida Report at 10.

B. What Rate to Use

As the price-usage data indicated, select demand categories can be managed by the type of rate design chosen. Rate design structures which are deemed conservation-oriented include: uniform-gallonage-charge rates, inclining-block rates, goal-based rates, seasonal rates, excess-use rates, scarcity pricing, and indoor/outdoor rates. Seasonal rate and excess-use rates address peak usage well whereas other rate design structures address average use. In reviewing the rate design reports over the past few years, it is evident that inverted block rates and seasonal rates are the most common conservation rate structures used across the United States.

An inclining block rate structure is comprised of two or more usage blocks with the price per unit increasing in each block. Under this rate it is anticipated that demand in the higher blocks will be more elastic to demand than in the first block.[10] Inclining block rate structures signal to customers that increased water usage will lead to higher bills. The effectiveness of this rate structure is dependent upon the number of usage blocks, gallonage breakpoint of each block, and the rate differentials. Generally the gallons in the first usage block should be set to capture at least 50 percent of the customer bills in order to maintain adequate revenue stability. In most cases, two usage blocks will be sufficient to produce the desired level of conservation. Depending on how customer bills are clustered, price levels within blocks can be adjusted and additional blocks can be added.[11]

Seasonal rates are effective in reducing excessive usage during specific periods of time. A seasonal rate can be added to any other rate structures. This approach increases water rates in the warmer, dryer months to reduce the summer peak usage resulting substantially from lawn irrigation. Under this rate, a higher usage rate is charged during the peak season than during the rest of the year. Since all usage during the peak season is changed the higher rate, there is a direct incentive to conserve during the peak months. The seasonal rate may be 25 to 50 percent higher (or more) than the off-peak rate, depending on the costs associated with meeting the peak demand.[12] Seasonal rates are most effective when there is a clearly defined peak season. The participants in this docket could identify the weeks they encounter peak demand. An advantage of reducing peak demand is that it postpones the need for capacity additions, which again, is exactly the situation docket participants found themselves in.

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[10] *Id.* at 17.
[11] *Id.*
[12] *Id.* at 19, *citing* Conservation–Oriented Water Rates, Journal AWWA, November 1996, at 70.
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The Hagler Bailly Report offered the following conclusions relative to which rate design is appropriate:

(1) As part of a conservation program, rates can be effectively used to reduce peak demand. Their effectiveness in reducing base-level consumption is less.

(2) The use of simple uniform rates with excess or seasonal charges is more effective than using permanent and complex increasing rate structures. Simple rate structures provide the consumer with more apparent and direct consequences for peak and excess water use.

(3) Since most systems utilize a combination of supply and demand-management techniques to promote conservation, specifically targeted programs such as low-flow fixture requirements and consumer education appear to be most effective in reducing base-level demand.

The Hagler Bailly study involved urban, rural, and suburban water utilities. They reviewed data from 1993 through 1996. They found the most common conservation rate was the increasing block rate structure. Utilities who switched to conservation rates, previously had uniform rates. In particular, eight utilities in the south eastern United States (EPA Region 4), four utilities in the south western United States (EPA Region 9), and three utilities in the north western United States (EPA Region 10) switched from a uniform rate to an increasing block conservation rate. Almost 90% of the utilities in Region 10 experienced shortages and restrictions since 1980.

Consumer awareness of the rate structures plays an important part in the success of this rate structure in achieving the goal of conservation. Thus, utilities must educate customers that increased usage will add significantly to their water bills. The Hagler Bailly report found the utilities spent on average $173,902 on conservation education programs. Utilities used bill stuffers, community education programs, media ads, leak detection programs, and plant tours.

In a case study of a successful recent demand side management program, California-American Water Company reported they spent upwards of $600,000 on conservation programs, including customer education. On December 9, 1996, California-American commenced a three year experimental program which combined the use of lifeline rates and a conservation-oriented rate structure.[13] Roughly $300,000 was spent on bill inserts and advertising for their 39,000 customers. In this situation, the State of California restricted water California-American could divert from the Carmel Valley

[13] *California-American Water* Company, Order No. 96-12-005, 69 CPUC 2d 398 (1996) (. The experimental program had specific statutory authority under California Public Utilities Code, § 701.10 (c) and 727.5(d) relating to conservation rate design; and 739.8(b) and (c) relative to low-income programs. Under California code 701.10 (c), the policy of the State is rates and charges shall "provide appropriate incentives to water utilities and customers for conservation of water resources." California Code 727.5(d): "the commission shall consider, and may authorize, a water corporation to establish programs, including rate designs, for achieving conservation of water and recovering the cost of these programs through the rates."

watershed. This restriction and the lack of any immediate new supply sources caused California-American to implement significant demand-side management measures in its Monterey District. Five inclining rate blocks were established, fixed monthly fees were reduced, and customers were given water allotments based on their lot size and household population.

Although California-American invested $600,000 in advertising, rebate programs, education programs, and billing changes at the outset of this experimental program, they now believe they can reduce that expenditure. Over the past few years it has become apparent to the utility that customers no longer need the education campaign to conserve water. California-American expects to now spend approximately $100,000 to $200,000 per year on their demand-side management program and they will be phasing out their rebate program.[14]

The success of the California-American demand-side management experiment and apparent market transformation is laudable but may indicate further study is needed. For instance, the Florida Commission found approximately 70 percent of the reduction in usage occurred during the first year following implementation of the conservation rate design. The Florida Commission also found 20 percent of the conservation impact diminished two years after the rate increase.[15] These diminished impacts, however, were not realized by California-American in their Monterey District program. In fact, they have seen stable, albeit more level usage declines. The variations in long-term impacts experienced by Florida and California-American indicate this issue may need further study and analysis.

Coupled with determining which rate and what type of education and notification plan to implement, a utility should consider impacts from billing frequency. Utilities billing quarterly may wish to change to monthly billing. Changing from quarterly billing to monthly billing can alert customers as to the cost of seasonal high use. If billing is kept infrequent, the season may be well over before the customers' bills reflect the increases, and thus the opportunity to conserve water is lost.

Other considerations with selecting rate design is that with seasonal rates, customer awareness is important to inform users that prices for summer peak usage will be higher than that of off-peak. With various rate block structures, educated customers may be motivated to periodically check his or her meter in order to track consumption levels, and therefore will be educated as to the effect of consumption in the various rate blocks. Including usage information on customer's bills would aid customer monitoring. In this way, the customer could adjust demand when possible.

Reduction in demand may best be accomplished not solely through rate design but through a combination of pricing and demand-side management, as well as the introduction of water efficiency technologies in appliances and fixtures. The above

[14] Staff telephone conversation with David P Stephenson, American Water Works Service Company, 303 H Street, Suite 250, Chula Vista, CA 91910, March 28, 2003.
[15] Florida Report at 43.

issues are just a few factors that must be considered in selecting a rate design for a particular water utility that compliments other aspects of a demand-side management program.

C. Effect of Conservation Rates on Revenue

A successful demand management program not only sends the appropriate signal to the consumer, it also recognizes the utility's risks. A utility's risks in adopting rate designs which discourage use include revenue instability, revenue shortfalls, increased per-unit fixed costs, and lower profitability.

Revenue instability was a concern raised by participants with respect to inclining block rates. Respondents to the Hagler Bailly Report stated revenue forecasting was made more difficult by conservation rate structures. These same concerns were also identified in the Florida Report. An interesting admission from the water utilities in the Hagler Bailly Report, however, was that 47% of the surveyed respondents implemented the conservation rate structure to enhance revenues. Forty-six percent indicated they imposed the conservation rate structure to conserve water resources. Another 25% indicated they imposed the rates to meet mandates. These survey results indicate further analysis, on a utility-specific basis, is warranted.

Rate instability upon implementing conservation rate structures is a product of the cost based method of how rates are historically structured. Revenues from rates cover generally two categories of expenses: fixed costs and variable costs. Fixed costs generally refer to meter reading, maintenance, billing, and other expenses not directly related to the quantity of water used. Variable costs such as costs for chemicals and electricity vary with the quantity of water used. A common feature in rate structures is to have fixed costs recovered with a fixed charge and variable costs recovered with a per gallon charge. Unfortunately, the variable costs of water utilities are not as large percentage of the total cost as in electricity or gas. As a result, rate structures which reduce the sale of the product and revenues from per gallon charges, will not render as great a reduction in variable costs. Therefore, a reduction in the demand for water will result in a greater adverse impact on the profitability of the utilities. A utility's ability, however, to reduce costs commensurate with a reduction in demand can mitigate the effect of the overall revenue instability caused by conservation rates.

To mitigate significant swings in utility earnings, a utility and regulators should compare the reduction in expenses and the potential cost savings associated with delayed capital facilities against a potential reduction in water revenues. Data as to consumption, lost water, trends, etc., will be essential to a thorough evaluation of the proposed rate(s). Information gleaned from growth management plans both at the utility level and regional planning commissions may assist in these analyses. With respect to inclining block rate, utilities must carefully establish the blocks of usage associated with the increased rate structure in setting rates. If revenues are expected to fall more than costs, a utility will

have little incentive to implement conservation programs without rate relief. A further complication is the effect that demand reductions may have on the amount of used and useful plant that will be included in a utility's rate base in future rate cases. Revenue estimates must account for the price elasticity of demand. If elasticity of demand is not considered then a reduction in quantity demanded may cause an unexpected revenue shortfall.

Arizona addresses revenue instability by using a monthly minimum charge and an average/median usage in the first block of the inverted rate.[16] New York uses a revenue reconciliation clause to capture excess revenues or make utilities whole for shortfalls.[17] It operates as a rolling three-year mechanism, with one-third the balance being billed or refunded each year. Washington has approved inverted block rates with expiration dates and requires excess revenues to be placed in a separate account and used only for conservation purposes.[18]

The California experimental demand-side management program noted earlier contained a Water Revenue Adjustment Mechanism (WRAM) to address variations in revenues during the present rate case. The WRAM would track the variations in projected revenue incurred under the experiment. The WRAM account balance would accrue interest at the 90-day commercial paper rate, and California-American would file an advice letter for amortization of such balance at any time that it exceeded 5% of gross annual revenues and was anticipated to exceed 5% of gross annual revenues within the following six months.[19]

Just as under-earnings may be an issue, regulators should consider what to do if a water company over-earns as a result of conservation rates? Commissions may be hesitant not to send the wrong price signal by lowering rates. As one solution, the Florida Commission treated the overage as a projected conservation expense and the utility was required to escrow the funds and submit a conservation plan for use of the funds.[20]

D. Conclusion

Key to a successful conservation rate structured is analysis of: (1) the utility's system design and available capacity; (2) the customers' demand characteristics and potential elasticity of demand; and (3) the appropriate environmental and regulatory goals.

The Commission has a long history of requiring utility rates be cost based. Historically, water rates have not been designed with conservation as a primary goal.

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[16] Florida Report at 32.
[17] *Id.*
[18] *Id.* at 33.
[19] *California-American Water* Company, Order No. 96-12-005, 69 CPUC 2d 398 (1996) .
[20] Florida Report at 50.

The clearest evidence of this is the old flat annual fees where customers did not pay per gallonage charges. In fact, declining block rates were common. Under declining block rates, as additional gallons were consumed the metered per gallon charge declined. These types of rates tend to demonstrate incorrectly that increased usage results in lower costs, and therefore lower rates for those greater levels of consumption are justified. Over the years, when investigating rate requests, the Commission has eliminated flat rates, declining block rates, and has required metered rates.

Rate structures can contribute to conservation, but adoption of such pricing policy should be carefully examined and established as close to actual cost as possible. In addition, such rate structures should be used in conjunction with demand management programs. Pricing alone does not always accomplish the goal of reduced water demand, especially when considering that the potential for income diversity in various community systems, as well as that in certain larger utilities, shows that some customers will pay substantially higher rates in order to continue to irrigate lawns and gardens.

To be consistent with cost based ratemaking, Staff believes that non-conservation rate measures be used first. Discouraging wasteful use of water by can be first addressed by eliminating unnecessary uses and unmeasured service and accompanying flat rates.[21] Leak detection and prevention should be afforded a high priority for all systems as well as meter installation for those relatively few remaining unmetered water systems. More stringent measures to reduce consumption as much discretionary water use during severe drought conditions could be implemented. Such measures could also include outside water restrictions, outside water bans, and penalties for enforcement of these measures.

Participants in this docket also identified regulatory lag as a disincentive to utilities implementing conservation efforts. The argument being current rate case proceedings before the Commission do not allow quick adjustments for water rates to ensure that a utility is protected from a substantial drop in revenues from lower customer usage. This concern can be substantially mitigated by a filing for temporary rates under RSA 378:27 and by careful review of seasonal conservation rates and other rate adjustments proposed during rate cases.

[21] This same recommendation was made by the Florida Public Service Commission in a report entitled *Conservation-Oriented Rate Structures for Water Utilities*, September 1997, at 14.

III. WATER CONSERVATION ACTIVITIES ELIGIBLE FOR RATE REIMBURSEMENT

A survey of water utilities conducted by the DES found that utilities felt deterred from pursuing aggressive outreach and education efforts due to the high administrative costs they would incur. To ameliorate that perception, it was suggested the Commission develop a list of pre-approved water conservation expenditures. That list is as follows:

A. Public Education, Outreach, and Technical Assistance

Allow utilities to recover the cost associated with implementing the following:

- Evaluating and providing recommendations to towns/local elected officials regarding the development of ordinances relating water resource management such as outdoor landscaping construction, water use restrictions, and stormwater management
- Developing programs that educate homeowners on how to properly grow and maintain lawns and gardens utilizing water efficient practices
- Supporting or initiate water efficiency education programs in area schools
- Making water conservation specialists available for public speaking engagements
- Developing and implementing a water conservation public advertising campaign
- Developing and maintaining a water conservation information and customer support center
- Offering water audits to customers (determine water use, test and repair leaks, provide retrofit devices; evaluate lawn and irrigation characteristics and recommend design modifications; identify all water conservation opportunities)
- Developing and implementing Commercial, Industrial, and Institutional Programs

B. Water Fixture Retrofitting and Replacement

Allow utilities to recover the cost associated with implementing the following:

- Offering water conservation retrofit kits
- Offering rebate programs for installing water efficient toilets, dishwashers, and washers (Note: For mechanical devices, USEPA has established an EnergyStar program that identifies devices that are energy and water efficient. All toilets sold after 1994 are water efficient due to Federal law)

C. System Metering and Improvements

Allow utilities to recover the costs associated with the following:

- The installation of separate meters for outdoor water uses
- The installation of remote reading meters
- The installation of compound meters where needed
- The implementation of monthly billing rather than quarterly billing
- The implementation of meter maintenance and calibration program
- The implementation of a system audit and leak detection program
- The implementation of a comprehensive water accounting/loss control program
- Implementing a feasibility study that looks at alternative new rate structures that provide incentives for practicing water conservation.

Staff recommends the Commission allow a utility to submit a list of water conservation expenditures for pre-approval by the Commission. Subsequent expenditures should then be deferred on the books of the utility until a rate proceeding where they would be included for recovery by the utility.

In the alternative, the Commission may wish to consider is formulating a specific policy, either by order or through administrative rules. For example, the State of Arizona has a conservation policy where the Commission pledges to seriously consider recovery of conservation costs depending on a number of factors:

1. Demonstration by the utility of a credible interest in promoting conservation and demonstrated ongoing efforts to promote conservation;
2. Demonstration that the utility made all reasonable efforts to negotiate an agreement that minimizes the cost of conservation measures;
3. Demonstration that conservation programs represent the least cost alternative to accomplish the conservation objective; and
4. Demonstration of the actual and potential effectiveness of the conservation measures for which cost recovery is sought.[22]

Staff believes the above activities suggested for pre-approval are consistent with the Commission's obligations under N.H. Rev. Stat. Ann. § 378:28 that rates be just and reasonable. The statute states "[n]othing contained in this section shall preclude the commission from receiving and considering any evidence which may be pertinent and material to the determination of a just and reasonable rate base and a just and reasonable rate of return thereon."

Staff recommends the Commission allow a utility to submit a list of water conservation measures for pre-approval by the Commission. Subsequent expenditures

[22] Arizona Corporation Commission, Decision No. 57680, Docket No. U-0000-91-368, dated January 9, 1992.

should then be deferred on the books of the utility until a rate proceeding where they would be submitted for approval and recovery by the utility.

IV. EFFICIENCY PROGRAMS SUCH AS PAY AS YOU SAVE (PAYS)

The most successful demand-side management program to date appears to be the California-American Monterey District experiment. Their program reduced demand more than the programs identified in the NRRI Report and the Florida Report. Part of the success of their program was the inclusion of measures aimed at replacing water-guzzling fixtures, appliance and other equipment with efficient, low-use water styles. California-American's program was a traditional rebate program. Inclusion of the rebate measures was supported by a 1994 report prepared for the California Urban Water Conservation Council: "for a household to substitute away from water usually requires up-front investments in water saving devices or landscapes. Because these investments can require large initial sums of money and because the payback of the investment may not be obvious to households, they frequently meet with household resistance."[23]

In New Hampshire, the Commission has approved rebate-styled efficiency programs but is moving toward PAYS programs to achieve the same results but on a more self-sustaining, market transforming basis.[24] The self-sustaining aspects of PAYS makes it a better choice than rebate-styled programs for other reasons. Participants in this docket indicated the Building Officials Code Administrators (BOCA) code had greatly improved water conservation in buildings build after 1993, but that something needed to be done to target buildings built before 1993. Savings in this area are great. For instance, a 1998 Potomac Resources, Inc. report on efficient plumbing products which stated replacing old fixtures with water efficient fixtures could reduce in-house residential water consumption by as much as 30%.[25] Addressing the majority of pre-1993 buildings could also be a lengthy process and would be best addressed by a sustainable program. In addition, relating back to California-American's rebate efforts at a hefty $200,000 per year, few water utilities in New Hampshire could support such programs. New Hampshire also lacks municipal ordinances, which California has enacted, requiring retrofitting of water efficient fixtures at time of sale or remodeling. Time is also ripe for these programs. Respondents in the Hagler Bailly Report, cited earlier, stated the most popular future programs included fixture rebate programs. These issues necessitate investigating PAYS.

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[23] Florida Report at 9, citing David L. Mitchell, M. Cubed, and Dr. W. Michael Hanemann, *Setting Urban Water Rates for Efficiency and Conservation*, California Urban Water Conservation Council, September 1994, at 5-9.

[24] The Commission expressed in *Electric Utility Restructuring* 83 NH PUC 126, 163 (1998) its long-held belief "that the most appropriate policy is to stimulate, where needed, the development of market based not utility sponsored and ratepayer funded energy efficiency programs." The Commission urged gas utilities to "review their program design and move toward non-rebate styled programs where appropriate to achieve market transformation goals." *EnergyNorth Natural Gas, Inc., et als,* Order No. 24,109 (December 31, 2002), slip op. at 19.

[25] Hagler Bailly Report at 13.

A. Statewide Availability Necessary

Efficiency programs such as PAYS use incentives to change purchasing patterns and encourage people to invest in efficient technologies. Public benefits inure from the fact that water resources are conserved. An efficiency program, however, is only as good as its' reach. Drawbacks to utility-based PAYS programs are that the Commission regulates water utilities which serve only about 10 percent of New Hampshire's population. Approximately 2,211 active public water systems exist in New Hampshire but only about 40 are regulated by the Commission. The vast majority of the water systems are small, under 100 connections. The Commission has no jurisdiction over municipal water departments, and thus a program open only to customers of regulated companies will not reach municipal customers. In addition, there are some 472,000 residents of New Hampshire who are served by their own private wells. Utility-based programs will not reach private well users.

In addition to the lack of broad Commission jurisdiction over water users, another problematic issue is that even if utilities themselves instituted water conservation programs, they are mostly small companies. Size becomes a problem since key to a successful efficiency program is the ability of the program costs to be spread out among numerous customers. If a water company does not have many customers, the program costs become a larger percentage of a water bill which becomes a disincentive to establishing a program. These jurisdiction and size issues can be minimized if a PAYS program is conducted on a statewide basis. That way, the PAYS program can provide clear benefits to both water users and our environment.

B. Legislative Authorization and Funding for Program Startup

Staff believes initiation of a statewide program requires legislative support. In the past, the New Hampshire legislature has enacted specific language to allow the electric industry to use a system benefits charge for costs related to energy efficiency programs.[26] Presently, no similar statutory authority exists regarding water utilities. Additionally, a statewide program would reach beyond specific utilities and the creation of such a broad program involves a public policy decision that should be made by the legislature.

The model Staff and the participants in this docket believed would be most workable was establishing a program by temporarily increasing the existing System Benefit Charge (SBC) that is currently added to the bills of electric customers in New Hampshire. Underlying the notion of tying a water efficiency program charge to an electric utility charge is that all electric consumers are also water consumers. This universality bridges the distinctions caused by water users obtaining water from either a regulated utility, municipality, or from a private well. Saving water also saves energy, thus reducing air emissions from electric power plants.

Staff and the participants believe an increase in the SBC would be temporary, and would only remain in place until a certain level of funding was established. In a PAYS

[26] N.H. Rev. Stat. Ann. § 374-F:3,VI (1996)

program, reaping benefits requires a source of initial funding so that measures can be installed in the customer's premises. The installation of water conservation measures in the premises creates actual dollar savings for the owner through reduced consumption. Out of that savings the owner then repays the cost of the measure or measures installed. Thus, the funds are returned to be used again. Through this means, a PAYS program for water conservation requires initial, but not on-going, funding. It becomes a self-sustaining program. Once an initial source of funding is established, it can be terminated once a budget amount is reached. To create a tie between water and electric system benefits charges in order to establish the initial funding, however, legislative support is required.

V. CONCLUSION

Staff recommends the Commission allow utilities to develop seasonal rate structures to address high usage peaks during the summer months. Incorporated into this recommendation is institutionalizing the consideration of water conservation considerations in water rate cases. As a part of a review of a rate case, certain data should be collected such as demand and supply characteristics, seasonal character of the water system, consumption trends, and lost water. This data can then be used to determine whether a seasonal rate or some other alternative approach to rate design may be appropriate.

Referencing back to the comments of participants in this docket regarding the difficulty resulting from lawn irrigation during drought periods, particularly those offered by the Town of Bedford, Staff recommends the Commission consider allowing water utilities to file supplemental tariff pages which would allow the imposition of penalties for violations of water use restrictions. Such tariff pages would be temporary, and would be in effect only during specifically defined periods of drought. The model for such Commission authorization would be *Manchester Water Works and Hampstead Area Water Company, Inc.*, Order No. 24,002 in Docket No. DW 02-077 (2002) where the utilities were authorized to put penalties in place for a limited time. Staff believes that instituting a process for such filings ahead of time, for use during drought conditions or other conditions of inadequate supply, may assist in preventing serious problems in some water systems.

Staff recommends the Commission allow a utility to submit a list of water conservation measures for pre-approval by the Commission. Subsequent expenditures should then be deferred on the books of the utility until a rate proceeding where they would be submitted for approval and recovery by the utility.

Staff and the participants in this docket recognized that for a PAYS program to be successful, it must be implemented on a statewide basis. Only a portion of the state, however, is regulated by the Commission and many water users rely on their own private wells. These conditions complicate implementing the utility-based efficiency program

model such as that used in the electric and gas industries. Funding is also an issue. Because the breadth of the proposed statewide water efficiency program is new and the funding means has not been used before, Staff believes the Commission should seek direction from the legislature.