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Small Water Systems: Challenges and Recommendations

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This report identifies the challenges, attributes, and practices associated with successful small water systems; examines state commission policies, practices, regulations, and standards that can improve the management and operation of small utilities; and provides conclusions and recommendations.

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Challenges and Recommendations

I. Overview: The Challenges, Successes, and Paths Available to State Commissions

More than 90 percent of water systems regulated under the Safe Drinking Water Act (SDWA) are small, serving 3,300 or fewer people.[1] While these small systems represent a large majority of all water systems, they serve only about 10 percent of the population – about 25 million people.[2]

This report identifies the attributes and practices of successful small systems. The report also examines policies, practices, and regulations that can help small systems increase economies of scale, improve management practices, and operate more efficiently and effectively. The report recommends a variety of approaches that state commissions should consider for policies, procedures and regulation of small water utilities.

A. The challenges facing small water systems

In 2000, small systems accounted for 90 percent of all systems that had, according to the U.S. Environmental Protection Agency (EPA), a "history of significant noncompliance" (violating one or more national primary drinking water standards in any three quarters within a three-year period).[3] A combination of deteriorating infrastructure, increasing federal requirements, deficient customer service and rising customer expectations, inadequately trained management, poor accounting principles, rates that are not based on costs, and lack of financial resources makes it hard for small water systems

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[1] The U.S. Environmental Protection Agency classifies water systems according to the number of people they serve. Classified as very small are systems that serve between 25 and 500 people; small, between 501 and 3,300 people; medium, between 3,301 and 10,000 people; large, between 10,001 and 100,000 people; and very large,100,001 or more people. This paper is concerned with water systems that serve between 25 and 3,300 people.

[2] U.S. Environmental Protection Agency, *Guidance on Implementation of the Capacity Development Provisions of the Safe Drinking Water Act Amendments of 1996*, Report No. 816-R-98-006, p. 11, July 1998.

[3] Office of the Inspector General, *Impact of EPA and State Drinking Water Capacity Development Efforts Uncertain*, Report No. 2003-P-00018, September 30, 2003.

to maintain an effective, efficient operation at a reasonable price. Among those serving fewer than 500 persons, many operate at a loss: 39 percent of privately-owned systems serving 500 or fewer persons had deficits or losses in 1995 and again in 2000. Larger systems had a lower incidence of losses or deficits: 10 percent lower for those in the 501 – 3,300 and the 3,301 – 10,000 size categories.[4]

By definition, small utilities have fewer customers over which to spread their fixed costs. EPA describes the resulting challenges:

1. continuous turnover of operations personnel;
2. part-time personnel who lack the necessary technical, managerial, and financial skills;
3. volunteer boards and councils; and
4. limited knowledge of increasingly complex drinking water regulations.[5]

B. Congressional intervention

Recognizing that small water utilities would have more difficulty than their larger counterparts complying with new and more stringent safe drinking water regulations, Congress included new programs in the 1996 Safe Drinking Water Act (SDWA) reauthorization to address this issue. These programs included the Drinking Water State Revolving Loan Fund (DWSRF),[6] operator certification, and capacity development.

Capacity development provisions in the 1996 amendments to the SDWA extended the authority of EPA beyond its environmental sphere into a new regulatory framework that required evaluation of and improvement in the technical, financial, and managerial

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[4] EPA, 2000 Community Water System Survey, p. 45. Survey estimates of losses are from a single year's financial data and therefore may be temporary.

[5] http://www.epa.gov/safewater/smallsys/pdfs/grants_smallsystems_requestforproposal_training-techassistance.pdf, p. 4

[6] According to the EPA 2006 annual report for the Drinking Water State Revolving Fund program (DWSRF), the program had provided almost $13 billion in assistance to communities to finance infrastructure needs and an additional $1.2 billion to support state and local drinking water programs through training, capacity development, and source water protection. The program had supported close to 5,000 projects needed to help public water systems achieve and maintain compliance with drinking water standards, including almost 500 projects for disadvantaged communities. The report and additional information about the program are available at: www.epa.gov/safewater/dwsrf.html.

capacities of drinking water utilities. These provisions are overseen and enforced by state primacy agencies.[7]

The capacity development provisions are linked to the DWSRF program. States failing to develop and implement a capacity development program will lose up to 20 percent of their DWSRF allotment. Water systems lacking the technical, managerial, and financial capacities to ensure compliance with the SDWA are ineligible for DWSRF assistance.

In developing and implementing a capacity development strategy, the federal act requires states to "consider, solicit public comment on, and include as appropriate" the following five elements:

1. Methods or criteria to prioritize systems.
2. Factors that encourage or impair capacity development.
3. How the state will use the authority and resources of the SDWA.
4. How the state will establish the baseline and measure improvements.
5. Procedures to identify interested persons.

C. State utility commissions response

This new regulatory framework affects state utility commissions. In most states, privately owned small water systems (and in fewer states, municipal systems) are subject to economic and service quality regulation by state utility commissions. Some examples of the ways state commissions that regulate water utilities have responded to small system difficulties include:

1. Offering training programs and operations manuals;
2. Adapting rate proceedings and other regulatory requirements to reduce the complexity and cost of regulation;
3. Assisting state primacy agencies with capacity development tests and capacity development programs;
4. Participating in interagency agreements and working groups to promote capacity development;
5. Appointing a receiver; and

[7] A "primacy agency" is a state agency responsible for implementing and enforcing a federal statute or program. In this case, state primacy agencies responsible for implementing and enforcing the provisions of the SDWA are typically the natural resources or environmental enforcement agencies in a state.

6. Inducing or mandating acquisition of small utilities by larger, more capable ones in order to take advantage of economies of scale in the provision of water service.

D. Paths toward solutions

Underlying the "small water system problem" are at least two issues. The first is managerial effectiveness: Are managers accessing and using all the tools available to lead water utilities effectively? The second is economies of scale[8]: Do small water utilities have the resources to operate efficiently and effectively? If not, what are the means by which economies of scale can improve? These two issues translate into the following options for state regulators:

a. Establish and enforce standards for higher levels of effectiveness. If such guidance and assistance does not produce the necessary improvement, induce changes in management or ownership.

b. Determine whether a utility's small size deprives it of economies of scale (e.g., in such areas as purchasing, treatment, administration, financing, and operations). If so, determine the best way to achieve the necessary economies of scale, including regional cooperation among small utilities, or mergers or acquisition with or by larger utilities.

c. Determine whether existing regulatory structures are appropriate; if not, make the necessary changes.

State commissions have undertaken an array of actions to assist and improve the operation of small systems and to encourage and expedite mergers and acquisitions to achieve economies of scale. There are fewer small systems being created, while some small systems have merged with larger public or privately operated systems. Many small systems, however, remain a challenge for state commissions and primacy agencies. Most of the smallest systems (those with 500 or fewer connections) are investor-owned[9] and therefore subject to regulation by state commissions. Also in this very small category are

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[8] The term "economies of scale" describes the benefits gained or costs saved from producing on a large scale. While economies of scale generally refers to the tendency for the average cost of producing a good to decline as a firm produces the good in greater quantities, there are other economies of scale that larger businesses and utilities can exploit, such as financial economies of scale. Larger firms usually have access to credit facilities at lower interest rates than do small utilities. Economies of scale can also be achieved through bulk buying of materials.

[9] The Cadmus Group for US EPA, *National Characteristics of Drinking Water Systems Serving Populations under 10,000,* EPA 816-R-99-010, July 1999.

ancillary systems (systems for which provision of drinking water is not the primary business).

E. Organization of this report

Despite their challenges, some small systems are successful. Reasons include managerial commitment to success, utility participation in programs established to assist them, and their ability to capture economies of scale. This paper seeks to assist regulators in helping small systems to replicate these successes. In the remainder of this report:

Part II identifies the challenges, attributes, and practices associated with successful small systems;

Part III examines state commission policies, practices, and regulations that can improve the management and operations of small utilities; and

Part IV describes the conclusions and recommendations of this report.

II. The Status Quo: Challenges and Successes

This section describes existing challenges for small water systems and the characteristics necessary to meet those challenges.

A. Challenges common to many small water utilities

1. Aging infrastructure

Water utility infrastructure includes, among other things, treatment plants, pumping stations, storage facilities, distribution mains, valves, and service lines. Utilities of all sizes are tasked with evaluating, prioritizing, funding, and implementing infrastructure maintenance and replacement activities. The need to replace water utility infrastructure is increasing, because the facilities installed to meet the unprecedented growth following World War II are nearing the end of their useful lives. According to the General Accounting Office (GAO) in 2002, more than one third of utilities had 20 percent or more of their pipelines nearing the end of their useful life. GAO found that an estimated 29 percent of the utilities had deferred maintenance because of insufficient revenues.[10] Since that time, concern over the security of water systems and their potential vulnerability to extreme weather events, vandalism, sabotage, and even

[10] United States General Accounting Office (GAO), Report to Congressional Requesters, *Water Infrastructure: Information on Financing, Capital Planning, and Privatization,* GAO-02-764 (Washington, D.C.: August 2002).

terrorism has prompted proposals to invest in additional infrastructure, protocols and personnel to protect our nation's drinking water.

In 1995, transmission and distribution was the largest category of infrastructure need cited by small and medium systems (fewer than 10,000 people). More importantly, small and medium systems had over three times the needs-per-household of larger systems. Sixty percent of small and medium systems reported infrastructure needs pertaining to source of supply, including threat of contamination.[11] A 2006 survey of the American Water Works Association's (AWWA) Small Systems Division, to which 9 AWWA state level sections replied, ranked the issue of "aging infrastructure and replacement cost" as the most important to small systems, followed by:

- Inability to retain and/or attract licensed operators.
- Inadequate rates and/or rate structures.
- Little or no access to regulatory process on either the state or federal levels and complying with regulations.
- Security issues and the lack of funding for security.
- Inability to access grant funds or low interest loans.
- Lack of governing body training.
- Lack of on-site technical assistance.
- Lack of access to operator training.
- Inability to access standards or guidance.[12]

[11] The Cadmus Group for US EPA, *National Characteristics of Drinking Water Systems Serving Populations Under 10,000*, EPA 816-R-99-010, July 1999, p. 5.

[12] American Water Works Association 2006 Small Systems Division Survey. Responding states included: Iowa, Nebraska, Ohio, North Dakota, New Mexico, Colorado, Wyoming, Idaho, Utah, Connecticut, Wisconsin, Arkansas, Oklahoma, and Louisiana.

2. Expanded requirements under the federal Safe Drinking Water Act (SDWA)

Community water systems must comply with the federal Safe Drinking Water Act. New, more stringent regulations will require investments in new technology.

One example is the Ground Water Rule (GWR). Most small systems use groundwater (wells), as compared to larger systems which more frequently use surface water.[13] Groundwater sources of supply are generally less susceptible to contamination from disease-causing pathogens than surface water sources. Consequently, groundwater systems have not been subject to the same treatment requirements as surface water systems. Unless a groundwater source were found to be under the influence of surface water or had a history of contamination problems, the water utility using it was not required to chlorinate its water supply. The purpose of the GWR is to provide stricter regulations and treatment requirements for groundwater systems that may be susceptible to contamination. The GWR, published in the *Federal Register* on November 8, 2006, applies to all systems with a groundwater source of supply. Public water systems need to begin actions to comply with the GWR in December 2009.[14]

Some other regulatory changes for water utilities include:

- Stage 2 Disinfectants and Disinfection Byproducts Rule (D/DBPR), which adds requirements to reduce disease risk associated with disinfection byproducts that form when water systems add disinfectants, such as chlorine, to the water.
- Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) which establishes more stringent protection measures against microbial contaminants, especially *Cryptosporidium.*
- New standards for arsenic and radionuclides in drinking water.

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[13] EPA 2000 Community Water System Survey.

[14] EPA's "Complying with the Ground Water Rule: Small Entity Compliance Guide" provides a step-by-step guide to the GWR requirements and how they apply to small public water systems. The Consecutive System Guide for the Ground Water Rule describes the specific responsibilities of both wholesale providers and consecutive systems which purchase water from wholesalers. It also provides recommendations to help them meet those responsibilities. The Ground Water Rule Source Water Monitoring Methods Guidance Manual includes information about the basis for ground water monitoring, how to determine the appropriate fecal indicator for monitoring, and how the different analytical methods work. Electronic versions of the guidance documents are available on the EPA website at: http://www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

These and other proposed EPA rules being considered will add to the investments and knowledge needed by small water systems to operate. A complete list of EPA drinking water regulations, policy and guidance can be found at http://www.epa.gov/safewater/regs.html

3. Difficulties educating management on operational and capital planning issues

In the 2006 AWWA surveys summarized above, small systems committee chairs identified lack of governing body training, lack of on-site technical assistance, and lack of access to operator training as constraints for small water systems.[15] Anecdotes abound of systems lacking the resources to hire a single full or part-time employee with relevant qualifications. Sometimes drinking water is only ancillary to a small system owner's primary business. There may simply be a general lack of interest and sense of resignation about what is and is not possible.

4. Insufficient resources to develop and administer low-income programs

The cost of supplying drinking water is increasing due to investments in treatment and distribution systems and to higher costs for energy and chemicals. As rates rise to cover these costs, more customers have trouble paying their bills. Some larger utilities have responded to the growing water affordability problem by establishing low income programs. In contrast, NRRI surveys found no small systems that offered assistance programs to their low income customers.[16] Small systems with the least ability to implement, administer, and fund a low income program often need it the most. Their small numbers of customers must pay more for the same (or a lower) level of service afforded to customers of larger systems.

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[15] American Water Works Association 2006 Small Systems Division Survey. Responding states included: Iowa, Nebraska, Ohio, North Dakota, New Mexico, Colorado, Wyoming, Idaho, Utah, Connecticut, Wisconsin, Arkansas, Oklahoma, and Louisiana.

[16] M. J. Stanford, *Water Affordability Programs Memorandum*, National Regulatory Research Institute, April 2007 (available at http://nrri.org/pubs/water/07-stanford.pdf

5. Insufficient resources at state commissions to assist small utilities

Water departments in state commissions, if they exist as a distinct section, are typically among the smallest departments.[17] Water-related workloads have grown as commission jurisdiction has expanded to include smaller systems of all types – investor-owned, municipally-owned, water districts, and cooperatives.

Water utilities usually agree that too few state commission resources are dedicated to water. Anecdotal evidence indicates that at state commissions and state consumer advocate agencies, the least experienced staff persons are assigned to small water utility cases on the grounds that trainees should train on small cases. The small effect of a rate increase, however, belies the myriad and complex problems a smaller utility and its customers are encountering. When the utility itself lacks a thorough, functional understanding of what is required by the regulatory process, the combination of inexperience and insufficient resources produces suboptimal outcomes.

6. Difficulties in achieving economies of scale

Small size is not an advantage when it comes to water system efficiency, reliability, economies of scale, and long-term sustainability. It costs small utilities more per unit volume of production to operate their systems. Small systems tend to pay higher prices for materials and supplies because the quantity they require is relatively small. They have fewer customers over which to spread costs. In most cases, small water systems were built to serve residents of a small community or a single housing development. There may be few, if any, commercial or industrial customers to spur production to more economically efficient levels.

B. Attributes of successful small systems

Despite these many challenges, small water systems do succeed. The National Association of Water Companies (NAWC) Utility Management Steering Committee has identified measures of an effectively managed water (or wastewater) utility:

1. Product quality
2. Customer satisfaction
3. Employee motivation and commitment
4. Operational optimization

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[17] At state commissions that also regulate wastewater, water and wastewater responsibilities are usually combined. Sometimes natural gas and water regulation are contained in a single unit.

5. Financial viability
6. Infrastructure stability
7. Operational resiliency
8. Community sustainability
9. Water resource supply adequacy
10. Stakeholder understanding and support[18]

These measures can be categorized into three sets of attributes, reflecting the three elements of the capacity development provisions of the SDWA: (1) managerial, (2) infrastructure and technical, and (3) financial. The three categories of attributes are interconnected; success in one category cannot be achieved without success in the other two.

1. Managerial attributes

Managerial capacity concerns the management structure and its effectiveness. Key elements include ownership; owner involvement and accountability; adequacy of staffing and staff deployment; and effective linkages with customers, regulators, and other stakeholders.

Small systems are more likely to succeed when providing customers with drinking water is the owner's primary or only business. Where the water system is not the owner's top priority, there is risk that problems will go unnoticed and necessary maintenance will be deferred. Most successful small systems have an owner with a passion for the business, one who recognizes and values the utility's public interest obligation. These systems also employ a licensed system operator who ensures drinking water safety, maintain adequate staff training, respond to customer concerns, work closely with the community and stakeholders, and nurture good public relations.

2. Infrastructure and technical attributes

Successful systems have adequate source water, treatment, storage, distribution infrastructure, and metering capacity. Their system personnel have and can apply necessary technical knowledge to operate the system efficiently and effectively. The result of these attributes is product quality: drinking water and effluent that meets or exceeds federal, state and local environmental standards. A successful water utility will be able to both (1) serve existing customers under existing regulations and conditions, and (2) adjust to changing requirements and circumstances and respond to emergencies.

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[18] P. Cook, "Preliminary Measures of Effective Management, from the Utility Management Steering Committee," November 2006.

Technical solutions for small systems may differ from those for larger ones, but they still must comply with federal and state regulations. Treatment technology options for small systems will continue to improve over time as entrepreneurs target this market, provided that small water utility managers keep abreast of and implement effective options.

3. Financial attributes

Revenue sufficiency, creditworthiness, and fiscal controls are central to system success. Where the financial capacity of the water utility is tied to the financial capacity of the owner, the risk is that water system adequacy varies with the vagaries of the owner's other businesses. Many small utilities cannot independently attract capital sufficient to maintain adequacy. Successful small systems have owners with sufficient financial resources or the ability to borrow money.

III. Approaches State Commissions Can Apply to Improve Conditions at Small Water Utilities

Having described existing challenges and the system characteristics necessary to meet those challenges, we turn now to state commissions: What practices are necessary to ensure success?

A. Regulatory requirements and procedures tailored to small systems

State legislatures, state commissions, and the utilities themselves have recognized that conventional regulatory tools are sometimes insufficient to meet the challenges unique to small water systems. Rate of return regulation, applied to small systems, is time-consuming, expensive, and overly complex and bureaucratic; so much so that small systems may be reluctant to file for rate increases. By the time they do, they may already be in financial crisis. Sometimes adding to rate filing hesitance is a close relationship between owner and customer—family members, friends, or resort guests—causing social pressure to keep rates as low as possible.

In response, state regulators have modified traditional regulation. Engaging small utilities regularly in regulation provides predictability for customers and side-steps steep increases in rates resulting from overdue rate cases. State commissions may detect potential system failures and have an opportunity to ward them off or manage a change in ownership. Examples of modifications include procedural changes, such as truncated proceedings and elimination of hearings, and ratemaking changes. These concepts are discussed below.

1. Procedural changes aimed at reducing the cost of regulation to small utilities

In Texas, for example, there are 600-700 investor-owned water utilities over which the Texas Commission on Environmental Quality (TCEQ) has original jurisdiction. A rate or tariff change request properly submitted to and approved by the TCEQ and noticed to customers will not become the subject of a contested hearing unless a threshold number of customer complaints are received by the TCEQ. Uncontested rates take effect without a hearing.[19]

A Colorado statutory provision, Section 40-3-104.4, C.R.S., provides for simplified regulatory treatment for small, privately owned water companies. This statute states that "the commission, with due consideration to public interest, quality of service, financial condition, and just and reasonable rates, shall grant regulatory treatment that is less comprehensive than otherwise provided for under this article to small, privately owned water companies that serve fewer than one thousand five hundred customers. The commission, when considering policy statements and rules, shall balance reasonable regulatory oversight with the cost of regulation in relation to the benefit derived from such regulation."

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[19] See Texas Administrative Code, Title 20, Part 1, Chapter 291, Subchapter B, Rule Section 291.28:

The commission may conduct a public hearing on any application.

(1) If, before the 91st day after the effective date of the rate change or the 61st day for a utility serving in 24 counties on Jan. 21, 2003, the commission receives a complaint from any affected municipality, or from the lesser of 1,000 or 10 percent of the ratepayers of the utility over whose rates the commission has original jurisdiction, or on its own motion, the commission shall set the matter for hearing.

(2) If the commission does not receive sufficient customer complaints or if the executive director does not request a hearing within 120 days after the effective date, the utility's proposed tariff will be reviewed for compliance with the Texas Water Code and the provisions of this chapter. If the proposed tariff complies with the Texas Water Code and the provisions of this chapter, it shall be stamped approved by the executive director or his designated representative and a copy returned to the utility. The executive director may require the utility to notify its customers that sufficient complaints were not received to schedule a hearing and the proposed rates were approved without hearing.

2. Ratemaking and accounting changes aimed at improving financial condition

Energy, fuel, chemical and other adjustment clauses, operating ratios, surcharges, rate indexing, and other methods designed to get more money to small water utilities more quickly, save time and generally reduce the cost and complexity of regulation. Some examples follow.

a. Staff-assisted rate cases

When state commission staffs are directly involved in rate cases for small utilities, they provide the analytical expertise and time that small systems may not have available in-house or may not have the money for which to hire consulting services. The Florida Commission is among those that offer staff-assisted rate cases to small utilities.

b. Recommended rates of return and rates of margin

Recommended rates of return and rates of margin for Class C and D water utilities[20] were updated by the California Public Utilities Commission (CPUC) Water Division in April 2007 based on current and anticipated interest rates and high operational risks faced by utilities in those classes. The CPUC Water Division calculates rates using both return-on-ratebase and operating ratio (rate of margin) methods of ratemaking and recommends the rate method that produces the higher result. This approach allows small utilities to earn a greater return than had previously been authorized by the CPUC. Operating ratio or rate of margin is used to determine a revenue requirement where little or no ratebase exists.[21] In 2005, the CPUC gave Class C and D water utilities the opportunity to voluntarily set aside a portion of the rate of margin return in a fund to provide dollars for infrastructure improvement or emergencies. The Florida Commission also offers generic rates of return applicable to all systems of a certain size. Operating ratios are also used by the Florida commission.

c. Capital improvement surcharges

Capital improvement surcharges collect a targeted amount of revenue to solve documented infrastructure requirements such as replacement of water mains. These tools encourage needed investment by accelerating cost recovery and allowing returns without a full rate case. To date, these mechanisms have not been widely used by small utilities. Examples: Ohio legislation permits water and wastewater utilities to collect surcharges

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[20] Class C utilities have 2,000 or fewer customers; Class D, 500 or fewer.

[21] Kevin P. Coughlan and Kayode Kajopaiye, *Memorandum to the CA PUC Regarding Rates of Return and Rates of Margin for Class C and D Water Utilities,* April 7, 2007.

for qualifying infrastructure plant and to earn a return on the valuation of that plant investment without filing a full rate case. Pennsylvania has a Distribution System Improvement Charge. Illinois has a Qualifying Infrastructure Plant Surcharge.

d. Commodity cost rate adjustments

Some larger utilities are seeking commodity cost adjustment clauses to enable them to periodically pass through increases (or decreases) in the per-unit cost of producing water. These commodity costs include expenses for things such as power, fuel, purchased water, chemicals and residuals handling. As the cost of a specified commodity rises, the utility adjusts the rate upward without a rate case and hearing. For small utilities with limited ability to manage rate case expenses, commodity cost adjustment clauses reduce their rate case cost because the utilities will not have to file rate requests as often as they would absent these commodity cost adjustments.

e. Rate indexing

Rate indexing updates rates automatically, based on indices such as the Producer Price or Consumer Price or Gross Domestic Product, or indices more representative of water utility costs. Rate indexing prevents earnings erosion, in which costs rise more quickly than revenues. A difficulty with rate indexing is finding an index that is an accurate surrogate for the costs and operating conditions faced by water utilities.

f. Escrow accounts

To ensure that rate increases intended for system improvements serve that purpose, some commissions require escrow accounts. New York established an escrow account (Case No. 05-W-1097) to collect $72,000 for capital improvements. A second escrow account was to provide funds for main repairs and extraordinary expenses. The commissions themselves must have the resources to monitor these funds. To use escrow accounts successfully, procedures governing them must be in place and state commissions must have staff resources sufficient to enable regular tracking of disbursements.

B. Policies to encourage acquisitions, consolidations and regionalization of small water systems

Small water utility problems are often problems inherent in small size, best resolved by consolidating ownership into larger utilities. This section addresses options for investigating and implementing economies of scale through consolidation and regionalization.

1. Inducements to encourage economic mergers and acquisitions

a. Guidance for establishing new systems

The Texas Commission on Environmental Quality (TCEQ) has published policy guidance[22] urging persons seeking to build and operate a water or wastewater system to:

- Request service from all existing providers within 2 miles of the proposed facility,
- Consider the feasibility of regionalization versus a stand-alone system, and
- Evaluate the affordability of rates for service provided through a regional approach as compared to a stand-alone operation.

Texas's policy encourages proposed systems to presume that regionalization is feasible. Those intending a stand-alone approach should demonstrate lack of nearby and willing providers, affordability, and other financial and technical considerations. The aim of the TCEQ's policy is two-fold: (1) to reduce per-customer costs by spreading them over a larger number of customers, and (2) to minimize the number of unsustainable utilities.[23]

b. Recovery of acquisition premium in rates

One incentive considered by states is "acquisition adjustment." To persuade an existing owner to part with his water system, the acquirer may have to pay an acquisition premium – the excess of purchase price over book value. The acquirer will hesitate to pay this extra cost without assurance of rate recovery. State commissions hesitate to allow an acquisition premium in rates because it disconnects infrastructure value from infrastructure costs – from the customer's perspective, there has been no change in assets or operations after the acquisition, yet the rates have gone up. In the context of small water systems, some commissions set aside this concern in the hopes of attracting acquirers able to exploit economies of scale associated with owning multiple systems.

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[22] *The Feasibility of Regionalizing Water and Wastewater Utilities: A TCEQ Policy Statement*, RG-357, Appendix B, January 2003. The policy implements portions of Senate Bill 1 (1997) and is intended to assist with implementation of regionalization requirements in Texas Administrative Code (30 TAC) Chapters 290 and 291. See 291.102: Criteria For Considering and Granting Certificates or Amendments. The policy statement (RG-357) does not change administrative rule requirements or procedures pertaining to CCNs and ratemaking.

[23] *The Feasibility of Regionalizing Water and Wastewater Utilities: A TCEQ Policy Statement*, RG-357, January 2003, pp. 3-4.

Example: In this situation, Aqua America sought permission from the North Carolina Utilities Commission to account for an estimated $18 million acquisition premium gained in the purchase of the stock of Heater Utilities by establishing an acquisition incentive account on Heater's books. The Commission *approved* an amount in the acquisition incentive account equal to two-thirds of the acquisition premium, including transaction costs incurred by Aqua America. The order also provided the means through which an acquisition incentive account could be converted to rate base in connection with the acquisition and upgrade of nonviable water and sewer systems in North Carolina. The order provided that Heater Utilities will be "active in pursuing the acquisition of such systems as identified by the Commission, the Department of Environment and Natural Resources (DENR) or the Public Staff." Non-viable systems are to include, for example, "systems for which an emergency operator has been appointed; systems that have received repeated notices of violations from DENR; or systems needing significant capital improvements that are not economically feasible."[24]

c. System-wide average rates after the acquisition

Single tariff pricing is another way to encourage mergers. Enabling a uniform rate structure or consolidated rates for systems owned by the same entity may encourage a corporate utility to grow its business by acquiring – whether contiguous or interconnected or not – other systems. With consolidated pricing, customers pay the same price even though their individual system may have unique operating characteristics and needs. Single tariff pricing makes it easier to share costs among larger numbers of customers. One objection to single tariff rates is that they mask spatial differences in the cost of providing service. A 1999 study revealed that some commissions utilize single tariff pricing on a case-by-case basis. Twenty-two commissions had allowed single tariff pricing at the time of the study.[25]

2. Adequacy of state commission authority to induce acquisitions

In most states, commissions do not have formal authority to order beneficial acquisitions or explicit statutory incentives to encourage them. Some state commissions are emphatic in their opposition to acquisition adjustment clauses because they tend to reward owners of poorly run utilities. Most states that permit them—Indiana, for example—do so solely to promote acquisition of failing systems. Acquisition

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[24] North Carolina Utilities Commission Order Approving Joint Stipulation and Transfer of Stock, Docket No. W-274, SUB 465, Docket No. W-200, SUB 45, Docket No. W-177, SUB 50, May 26, 2004.

[25] Joint Report of the US EPA and NARUC, *Consolidated Water Rates: Issues and Practices in Single Tariff Pricing*, September 1999.

adjustments requested by the acquiring utility are not typically provided when the small utility being purchased is considered to be viable.[26]

The Pennsylvania PUC amended its policy statements concerning the acquisition of water and wastewater systems in 2006. The Commission considers the following incentives for acquisition of *failing* systems:

- Rate of return premiums
- Acquisition adjustment
- Credit acquisition adjustment
- Debit acquisition adjustment
- Deferral of acquisition improvement costs
- Plant improvement surcharge

A policy statement concerning acquisition of *viable* systems sets forth the Commission's latitude to allow an acquiring utility with a "demonstrated track record of acquiring and improving service…" to request a rate of return premium in a subsequent rate case.[27]

Section 529 of the Pennsylvania Public Utility Code contains a *mandatory* takeover provision that the Commission can use to force acquisition of small systems serving 1200 or fewer customers by a larger, more capable utility. Although the takeover provision has been used only sparingly since 1992, when it was enacted, sometimes simply having a regulatory option available fosters beneficial results. A consumer advocate offered this assessment during testimony concerning creation of a similar takeover mandate for gas utilities: "…the fact that the Commission has this tool in its toolbox has arguably led to public benefits because the owners of small water and sewer utilities may realize that if they do not correct their problems or sell their business voluntarily to an entity that can resolve those problems, they are subject to the provisions of this law."[28]

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[26] Jerry Webb, Director, Water/Sewer Division, Indiana Utility Regulatory Commission, telephone interview, August 2007.

[27] *Final Policy Statement on Acquisitions of Water and Wastewater Systems*, Doc. No. M-00051926, in PA Bulletin, Doc. No. 06-1909.

[28] Sonny Poposky, Testimony Before the House Consumer Affairs Committee of Pennsylvania Regarding Special Session House Bill 40 and House Bill 41, Natural Gas Issues, November 9, 2007, Philadelphia, Pennsylvania.

C. Certification requirements for new small utilities

Some states have increased the rigor of criteria applicable to those seeking approval to establish and operate a new water or wastewater system. Typically, prospective providers must prove the need for services; demonstrate financial, managerial and technical capability; and have a plan for the system. Sometimes they must demonstrate that connecting to an existing system or a regional approach to providing service is not feasible before a new, stand-alone system can gain approval.

To assure financial readiness, some states are requiring a bond or other surety that the utility would forfeit for failure to properly operate and maintain the utility. In North Carolina, Section 62-110.3 of the statutes states, "No franchise may be granted to any water or sewer utility company until the applicant furnishes a bond, secured with sufficient surety as approved by the commission…."

D. Cooperation, coordination, and working relationships between state commissions, primacy agencies, and other stakeholders

Every organization develops, over time, systems, methodologies, and processes for working together with other agencies, organizations, and stakeholders with related or overlapping missions and interests. Sometimes these working relationships are effective and sometimes not. All too often, though, such organizational relationships are informal and depend largely on the personal association among individuals within the respective organizations. To optimize coordination and working relationships, agencies and organizations or their governing bodies should agree on clear objectives, expectations and responsibilities, which are then formalized in written documents.

1. Use of Memoranda of Understanding

In recent years, ad hoc and informal cooperation between state environmental and economic regulators to address compliance problems among small non-viable water utilities has matured into coordinated relationships spelled out in memoranda of understanding (MOUs). A model MOU would include state commissions, state primacy agencies, water infrastructure development and financing authorities, and public health agencies. It would contain provisions permitting those entities to use their individual powers cooperatively to solve small system problems. Interagency groups should have authority and standing to contribute their collective expertise and joint opinions to processes and proceedings that establish and implement policies.

MOUs vary in rigor and complexity. In some MOUs, the parties simply agree to meet a few times a year to share information. In other instances, the MOU specifies shared objectives. An early example of this is a 1994 MOU between the Pennsylvania Department of Environmental Resources and the Pennsylvania PUC, stating in pertinent part:

> It is DER's and the PUC's objective to work closely together and with other agencies and organizations involved in the provision of drinking water to encourage restructuring of small water systems in order to substantially reduce the number of existing non-viable small water systems and ensure the long-term viability of all new drinking water systems.

The two agencies agreed to participate jointly in the PUC Problem Water Company Task Force and the DER Technical Assistance Center for Small Water Systems Board (TAC Board). They also agreed to coordinate on enforcement actions and to exchange surveillance, compliance and enforcement information. The PUC further agreed, among other things, to inform DER about pending rate cases and to provide complaint referrals and information concerning compliance actions.[29]

An MOU entered into by the Missouri Public Service Commission and the Missouri Department of Natural Resources contains detailed information and more guidance on the responsibilities of the respective agencies. Among the PSC responsibilities:

- That the PSC's water and sewer department recommend rate increases to the PSC sufficient to provide the operating revenues necessary for adequate system operation and maintenance, to provide debt service coverage on any State Revolving Fund loans provided by the DNR and to maintain compliance with applicable laws and regulations;

- To share copies of all reports regarding the inspection of PSC-regulated water and wastewater utilities and all formal complaints pertaining to environmental compliance;

- To share copies of all PSC notices and orders regarding the issuance or modification of a Certificate involving water or wastewater utilities. Such notices and orders shall include those relating to public meetings or hearings regarding the issuance or modification of a Certificate, as well as the orders noting the PSC's approval or disapproval of the issuance or modification of a Certificate;

- To provide DNR the opportunity to participate in significant compliance inspections of PSC-regulated water and wastewater utilities; and

- To provide information and training to PSC-regulated water and wastewater utilities regarding the standard business practices needed to

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[29] *Memorandum of Understanding Between the Pennsylvania Department of Natural Resources and the Pennsylvania Public Utility Commission*, December 2, 1993.

justify rate increases for system operation and maintenance improvements and/or facility replacements or upgrades;

Similar reciprocal responsibilities are incumbent on the state primacy agency.

2. The Texas approach: economic and environmental regulation under one roof

The Texas Legislature placed all economic and environmental regulation—i.e., all water and wastewater planning, environmental protection and economic regulatory responsibilities—in one agency. The Texas Commission on Environmental Quality (TCEQ) is a large, multi-sector agency with responsibility for a vast array of public health and environmental protection functions for the state of Texas. The Legislature moved responsibility for setting rates for water and wastewater utilities from the Texas Public Utilities Commission (PUC) and assigned it to the TCEQ. TCEQ's stated mission is to protect Texas's human and natural resources in a manner consistent with economic development.[30]

Objectives of TCEQ's oversight of water and wastewater utilities are assuring that they have the financial, technical and managerial capabilities to reliably serve customers, comply with state and federal environmental mandates, and, where warranted, become part of a regional approach to water supply assurance and protection. The Water Supply Division is responsible for programs that ensure the efficient administration of surface water use, the delivery of safe and adequate drinking water, and the provision of dependable utility service at fair cost.

a. Water supply regulation

The Water Supply Division:

- Oversees public drinking water protection by implementing the Safe Drinking Water Act.
- Provides source water assessment and source water protection.
- Provides technical assistance on design and operation of public water systems.
- Reviews applications for rate changes, certificates of convenience and necessity, utility sales, district creation, and district bond issues.
- Reviews engineering plans for new or significantly modified public water systems.

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[30] Governing rules may be found in the Texas Administrative Code, Title 30: *Environmental Quality*, Chapter 30: *Texas Commission on Environmental Quality*.

- Assesses the financial, managerial, and technical capabilities of public water systems.
- Reviews applications for surface water use, water rights ownership changes, and use of river beds and banks.
- Provides support to interstate water compacts.
- Maintains water availability models for the river basins of Texas.
- Serves as state coordinator for the National Flood Insurance Program.
- Evaluates water conservation plans and drought contingency plans.
- Administers the Water-Saving Plumbing Fixtures Program.
- Manages the Water Utility Database and the Water Availability Modeling Database.
- Performs groundwater quality planning and assessments.
- Provides support for the interagency Texas Groundwater Protection Committee and the *Texas Groundwater Protection Strategy*.
- Manages the state's plan for preventing groundwater pollution from pesticides and the state's program for the identification of priority groundwater management areas.[31]

b. Public involvement and stakeholder communication

TCEQ has an extensive, ongoing public involvement and advisory program that operates alongside public notices, meetings, and opportunities for affected ratepayers to make comments before TCEQ Commissioners concerning rate decisions. Advisory bodies include:

Advisory Committee for Water Utility Operator Licensing: An advisory committee that advises the TCEQ on matters related to training and licensing of water and waste water utility operators.

Certificate of Convenience and Necessity (CCN) Stakeholder Meeting: An open-participation stakeholder group that offers input to TCEQ staff regarding rules for establishing public water or sewer utility service areas.

Drinking Water Advisory Work Group (DWAWG): An open-participation group, which meets quarterly to discuss compliance with state and federal drinking-water regulations and improving customer service.

[31] See http://www.tceq.state.tx.us/about/organization/oprr.html#6.

c. Merits of the Texas approach

The Texas Legislature established the all-inclusive TCEQ to provide for one-stop shopping for all Texas environmental programs and concerns including those associated with water and wastewater utilities. Benefits of a one-stop shop include cost-savings associated with combining agencies with similar missions both physically and in terms of staffing. In addition, commissioners who govern all of TCEQ's myriad programs have a broad, comprehensive view of Texas's environmental needs and opportunities. Commissioners are able to view issues through multiple perspectives and can readily tap into the broad-based knowledge bank of TCEQ staff working in an array of programs.

At the staff level, knowledge on the environmental side and knowledge on the economic/utility/regulatory side is readily available and respective staffs can easily work together in a holistic and comprehensive manner to address problems. An example would be in the case of a utility struggling financially, managerially, technically, and with their customers and other stakeholders. TCEQ's combined knowledge and authority increases the agency's efficacy to solve specific problems and pursue agency-wide goals and objectives.

E. Establishing standards and expectations for management, infrastructure and technical capability

State commissions regularly establish financial standards and expectations for utilities. A number of financial approaches for improving small utility conditions are discussed above. However, the financial stability of any utility, particularly a small utility, depends upon managerial effectiveness, technical proficiency, and dependable infrastructure. As discussed previously, these attributes are inextricably linked. A small water utility must achieve them all to be successful.

State commissions, therefore, should also consider management, technical, and infrastructure issues during the regulatory process. Deficiencies in these areas will result in diminished customer service and will ultimately lead to financial instability for the utility and unreasonably high rates. Commissions should establish standards and expectations for management, infrastructure, and technical capability to avoid these consequences.

Commissions should first investigate whether they have the legal authority to establish such standards and expectations. If they do not, they should determine how they can achieve such authority. If they do, they should proceed to prepare standards and expectations that meet their specific needs. The selection of specific standards will depend on the unique situations faced by any given commission.

Development of standards options for commissions is beyond the scope of this paper. The following, however, are areas commissions may want to consider:

1. **Management standards and expectations**

   a. **Strategic business plan**, covering
      i. core business practices and services,
      ii. optional services,
      iii. service quality,
      iv. workforce flexibility,
      v. continuous improvement,
      vi. succession planning and management,
      vii. community outreach and communication,
      viii. performance measurement and benchmarking, and
      ix. customer satisfaction.

   b. **Training and continuing education programs** for
      i. office employees,
      ii. field employees,
      iii. management staff, and
      iv. members of the governing board.

   c. **Emergency response plan**, including
      i. annual updates,
      ii. annual training (tabletop and field exercises), and
      iii. mutual aid and assistance partners and networks.

2. **Infrastructure and technical standards and expectations**

   a. **Capital improvement plan** (short-term and long-term)

   b. **Water supply plan** (short-term and long-term)

   c. **Asset management plan**, including

      i. system assessment,
      ii. useful life of each facility and pipe segments,
      iii. facility criticality and prioritization, and
      iv. reinvestment needs over time.

d. **Infrastructure backup to meet peak demands** (e.g., two times the annual average demand or other appropriate standard)

e. **Comprehensive employee safety program**

f. **Comprehensive facility security plan**

g. **Effective written standard operating procedures** (reviewed and updated frequently)

h. **Meter maintenance and replacement programs**

IV. Conclusions and Recommendations

Many small water and wastewater utilities continue to struggle to achieve economies of scale, financial stability, managerial excellence, and technical proficiency. These utilities have difficulty operating effectively and efficiently, maintaining their equipment and infrastructure, complying with federal and state regulations, providing reasonable rates and high standards of customer service, and, in some cases, simply staying in business. Despite federal programs such as the Drinking Water State Revolving Fund and the capacity development provisions of the Safe Drinking Water Act amendments of 1996, problems persist for small water systems. The situation is likely only to worsen as infrastructure replacement needs increase and as new regulatory requirements demand increased investment in water systems.

Some small systems are successful. It is instructive to consider the attributes those systems possess to achieve that success. Those attributes may be able to be applied to other, less successful small systems to improve their situations.

Some state commissions have implemented effective practices, policies, procedures and regulations to assist small utilities and their customers. These include: (1) providing technical assistance and advice, (2) simplifying rate procedures, (3) modifying rate designs and structures, (4) establishing policies to advance consolidation and regionalization, (5) strengthening certification requirements for new small systems, and (6) working closely with primacy agencies and other stakeholders to improve small system conditions.

State commissioners and their staffs should assess the proficiency of small utilities whenever they have interaction, whether it is a call to staff for advice or assistance, an application for approval of a certificate of convenience and necessity, or a rate case. At such times, the commission should ask the following questions:

1. Does the utility have the managerial attributes to succeed?

    a. Is the owner or manager dedicated to the business of the utility?

    b. Is the owner or manager accessing and using the tools available to lead, manage and operate the utility effectively?

    c. Does the utility have a strategic business plan?

    d. Does the utility maintain an up-to-date emergency response plan with annual training?

    e. Does the utility have difficulty attracting or retaining qualified personnel, including licensed operators?

    f. Does the utility have an effective training and continuous improvement and education program for its front-line staff, management staff, and members of its governing body?

    g. Are employees motivated and committed to the success of the utility?

    h. Does the utility meet its regulatory obligations and deadlines for monitoring and reporting?

    i. Is there effective and frequent communication between utility management and its employees, regulatory agencies, customers and other stakeholders, and the general public?

2. Does the utility have the infrastructure and technical attributes needed to operate effectively and efficiently?

    a. What is the condition of utility infrastructure (e.g., water mains, storage reservoirs, pumping stations, treatment plants)?

    b. Is there sufficient infrastructure backup to meet normal peak demand situations, based on state standards or commission expectations?

    c. Does the utility have written capital improvement and asset management plans?

    d. Does the utility have effective safety and security plans and programs that are reviewed and updated annually?

    e. Does the utility have effective, written standard operating procedures that are reviewed and updated annually?

    f. Does the utility implement appropriate new technologies into all aspects its operations (e.g., business functions, communications, customer service, water quality, systems operation, field work)?

    g. Does the utility meter all of its customers and maintain an adequate meter replacement program?

h. Does water quality consistently meet or exceed state and federal standards?

i. Does the utility have an adequate source of water supply for projected growth in demand?

j. Are utility operations optimized as indicated by service disruption rates, unaccounted for water use, electric power use, and other common operational benchmarks?

3. Does the utility have the financial attributes to succeed?

a. Does the utility maintain economies of scale sufficient to operate efficiently?

b. Does the utility have reasonable rates when compared with other utilities in the area?

c. Does the utility apply for rate cases at appropriate intervals to avoid large rate increases?

d. Does the utility have adequate financial resources, such as sufficient revenue, good credit, and access to financial markets?

e. Does the utility maintain good financial records and controls?

f. Does the utility purchase commodities and services at reasonable rates?

g. Does the utility have a low-income customer assistance program?

4. Are utility customers satisfied with the service they receive?

If commissions are not satisfied with the answers to the above questions, they should consider (if not already implemented) the following actions to resolve deficiencies:

1. Improve communication with the utility by directing staff to be proactive in engaging discussion on a regular basis, rather than waiting for the utility to initiate contact.

2. Provide staff assistance to small utilities to prepare rate cases.

3. Eliminate hearings for uncontested rate cases.

4. Implement simplified rate cases.

5. Implement rate designs and structures and accounting procedures to improve financial conditions, such as

a. rate calculation options; e.g., return-on-ratebase or operating ratio (rate of margin), to allow utilities a greater return than previously authorized;

b. capital improvement surcharges to deal with infrastructure needs;

c. commodity cost rate adjustments between rate cases;

d. rate indexing to address rising operational costs; and

e. escrow accounts to ensure funds are used for intended purposes.

6. Encourage consolidation and regionalization by

a. publishing policy-level guidance for new system applicants to consider the feasibility of regionalization and consolidation with another utility;

b. allowing recovery of acquisition premiums in rates; and

c. implementing single tariff pricing.

7. Require new utility applicants to provide a bond or other surety to ensure a properly operated and maintained utility.

8. Publish policy and execute memoranda of understanding to improve and ensure a tight working relationship between the state commission, state primacy agency, financing and public health agencies, and other stakeholders.

9. Promote a reorganization or consolidation of regulatory agencies that will better address small system issues.

10. Establish standards and expectations for managerial effectiveness.

11. Establish standards and expectations for technical proficiency.

12. Establish standards and expectations for infrastructure dependability.

In order to accomplish these objectives, a state commission must place a high priority and emphasis on water (and wastewater) matters. This may require assigning or hiring more staff. While natural gas, electricity, and telephony services are now subject to competition to various degrees, water's essential monopoly characteristics have endured, and remain the one area where good, old-fashioned rate of return regulation is consistently practiced by state commissions. The water challenges of today, however, cannot be solved through rate cases alone. Rulemakings, inter-governmental water groups, planning entities, governors, and others are calling on state utility commissions to be a part of a broader regulatory and public policy agenda. Commission staffs are well-suited to engage in these more amorphous spheres of public policy development.

Commissioner involvement is also important, but may be constrained by existing laws governing their conduct. Commissioner decision-making involves discrete, clearly identified parties of interest, and concerns itself with only that information placed into the record by the parties to the regulatory proceeding.[32] These rules may legally constrain commissioners from participating fully in rulemakings, policy development forums, and other quasi-legislative activities. For example, the creation and approval of new regulatory structures and institutions or coordination of public and private sector water stakeholders require free access to information and unfettered opportunities to vet new ideas for solving enduring problems. To solve water problems that go beyond the traditional sphere of rate of return regulation, state legislatures and state commissions should consider the efficacy of different "rules of engagement" for commissioners participating in quasi-legislative policy development processes.

Whatever alternatives are used by state commissions to help small systems, essential elements of a lasting solution are: (1) improved communication between state commissions and small utilities; (2) improved working relationships between state commissions and other regulatory agencies and stakeholders; (3) increased small water utility attention to economies of scale; (4) small system managers accessing and using the tools available to assist them; and (5) sufficient state commission authority and resources to implement the policies, procedures, regulations, and standards needed. With sufficient commitment and personnel, coupled with collaboration among key entities, small systems' problems can give way to something better.

[32] Ashley C. Brown, "The Duty of Regulators to Have *Ex Parte* Communications," *The Electricity Journal* (March 2002): p. 10.