Rural Water Systems Work Hard to Deliver Quality Product

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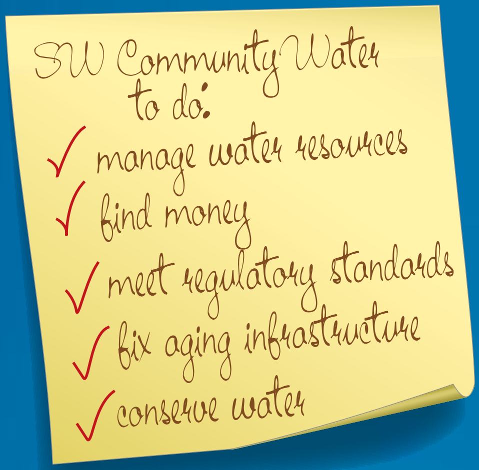
To protect the precious commodity of drinking water, rural community water systems in the Southwest must excel at a variety of tasks with only limited resources: conserving and managing water resources, meeting regulatory challenges, upgrading aging infrastructure, and obtaining adequate funding.

Evolving Conservation Practices

Long-time residents of small, rural towns can remember when their public water system was built, their households went dry, or they had to haul water from an irrigation ditch. Government and the community collaborated to build drinking water systems specifically for domestic use. Back then, water conservation and drought management practices were a part of life. When a tank emptied overnight or the town found itself with no water, residents went house to house looking for the leak until it was found and fixed.

A rapidly changing population and shift in community values have weakened traditional water conservation practices. Generations today grow up with water at their fingertips, never knowing or imagining water scarcity. Volunteers and staff from small water utilities attempting to read meters have been threatened by users opposed to any water use monitoring. Newcomers love the climate in the Southwest, but can't give up the green lawns for low-water-use landscape. The cumulative effect of such water usage has forced many communities to institute more formal water conservation practices.

Unfortunately, the disconnect between water resources and water delivery systems has caused chaos in many small western towns. Water shortages lead many small communities to seek public funding to replace a well, when in fact the shortage frequently is caused by leaks in the distribution system. Metering systems with meters both at the water



source and at the point of delivery do not exist in many communities, and without them, communities are unable to implement conservation policies. Thus, many small utilities are left to rely on their customers' conservation efforts. In other cases, customers' actions, or inactions, force decision makers to do what is best for the community.

However, some forward-thinking small communities are employing a variety of water conservation practices, such as metering all customers, implementing scaled water rates, replacing aging infrastructure, and implementing leak detection programs. Unfortunately, these measures are sometimes met with resistance.

As Roy Mares, president of the Buenavista, New Mexico Water Association said, "When people complain and threaten me, saying, 'How dare you cut my water off?' I tell them, 'I did not cut your water off. You still have access to water: you can still get water at Wal-Mart, at the gas station at the supermarket, or you can go haul it from where you can get it for free. But in our system, we cannot afford to provide the service for free.'"

Compliance is Costly

Rural water systems must also confront stringent federal and state minimum drinking water quality standards. Complying with applicable regulations is often quite difficult for large municipalities and nearly impossible for small rural communities, which generally have a higher percentage of low-income residents and aging infrastructure and far fewer resources.

In particular, rural communities are struggling financially to meet new or more stringent arsenic regulations. Since Jan. 23, 2006, many water systems in the Southwest are technically out of compliance with the new

standards and will probably remain so indefinitely due to the financial hardships involved in upgrading.

The Pipes Are Getting Old

As private homes age, pipes and household plumbing fixtures leak—especially old toilets and faucets. For public water systems, the consequences of aging infrastructure are even greater. When water system main lines break, repairs can actually cause a ripple effect and more breaks in the brittle, old pipes.

To determine infrastructure needs, rural communities must consider when their wastewater and water systems were installed and predict how long the systems are likely to last. Important factors that influence the appropriate timing of expansions to these systems include recent or expected population increases, regulatory requirements, and funding availability.

Large population increases were seen across the Southwest in the 1940s and 1950s. Regulatory requirements for water and wastewater increased in the 1970s, as did funding availability for wastewater facilities. Thus, many water and wastewater systems were built 20 to 70 years ago and will require replacement in the next 20 to 30 years.

In-ground piping for both water and wastewater systems can last up to 100 years, while mechanical and electrical equipment in a wastewater pumping station may last only 15 (see table). The useful life of other components depends on their durability and type of service environment. For example, concrete tanks used in wastewater systems have a shorter life span than those used for drinking water applications, due to the more corrosive nature of wastewater. Pumps that are well-maintained will last longer, as will electric motors operated to minimize starts and stops.

Funding Is More Selective

Drinking water systems historically have relied on state and federal grants to perform periodic system improvements and upgrades. However, grant dollars have diminished in recent years as the cost to replace system infrastructure has more than doubled. Small systems find themselves ill-equipped to meet the financial burden.

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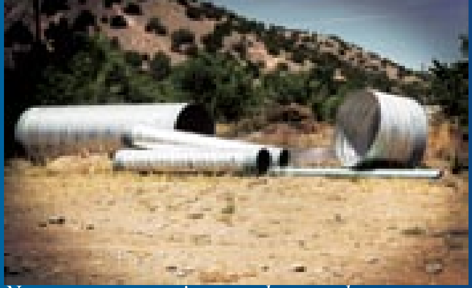
and grants, water systems must show that their rate structures sufficiently meet annual operations and maintenance expenses, debt service payments, and a variety of reserve accounts that cover items such as emergencies, debt reserve, capital improvements, and operations.

Legislators now recognize that grant funds appropriated to small systems in the past often provided only a temporary fix. As a result, state and federal sources are awarding fewer projects with larger



New stormwater pipes ready to replace degraded ones.

Photo: Alex Carpenter

amounts, with the aim of completing single or multiple phases of infrastructure improvements to maximize funds and address public health and welfare concerns. Funding also is being directed toward regionalizing small systems in an attempt to resolve ongoing issues such as billing and collections, certification of water operators, and water quantity and quality.

Funding today is directly related to a system's ability to sustain itself over the long-term. Sustainability is linked to water rates, membership fees, planning, collaboration and cooperation with neighboring systems, and water conservation. Water systems must now operate as successful businesses to survive.

Wanted: Leaders

For small systems to meet these challenges and serve their customers into the future, they require leaders with strong advisory, managerial, and technical skills. Board members must be able to collaborate, cooperate, negotiate, envision the future, strategically plan, enforce compliance, and manage. Existing physical deficiencies and compliance problems may stem from underlying historical board leadership (or lack thereof). Rural, small systems do not have the management resources of their larger, urban peers, thus leadership skills may have to be shared among multiple individuals rather than a single specialist, increasing the need for coordination. Finally, technical leadership unlocks the power of new technologies and is the foundation for affordable dependability.

Useful Life of Water and Wastewater Facilities

Useful Life (Yrs)	Water Facility Description
65 - 95	Distribution systems
65 - 95	Trunk mains
50 - 80	Reservoirs and dams
60 - 70	Treatment plants and pumping stations – concrete structures
25	Pumping stations – mechanical and electrical
15 - 25	Treatment plants– mechanical and electrical

Useful Life (Yrs)	Wastewater Facility Description
80 - 100	Collection systems
50	Treatment plants and pumping stations – concrete structures
15 - 25	Treatment plants – mechanical and electrical
25	Force mains
15	Pumping stations – mechanical and electrical

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