

WATER UTILITY CONSERVATION PRACTICES

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Obed Watershed Community Assn.

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TN Lacks Watershed Conservation Program: The US EPA recommends that states have water conservation programs, but the State of TN does not. The TN Division of Water Supply has no staff dedicated to water conservation; however, since the drought emergency, staff have worked with utilities in developing or reviewing drought-related emergency water conservation plans.

Benefits of Municipal Water Conservation and Planning: Conservation helps water utilities to avoid, downsize, or postpone water and wastewater projects. The facilities used to treat and deliver drinking water (and to collect and treat wastewater) are sized to meet demand; if the level of demand is inflated by wasteful use, people pay more in both capital and operating costs than is necessary. When the cost of supplying drinking water and processing wastewater is reduced, financial resources can be used for other purposes. Developing a water conservation plan begins with a water utility designating a water efficiency coordinator who then works with stakeholders on a water efficiency plan.

Level 1 Conservation Measures

Universal Water Metering: Meters measure water use, providing the essential data for charging fees based on actual customer use and the basic first step for water conservation. Service-connection metering provides feedback information to customers on their water use.

Utilities can also use information about metered water use to aid in detecting leaks throughout a water system. Utilities first need to meter how much water they process for distribution. Water provided free of charge for public use, such as public facilities and recreational uses, also needs metering. Reading source and service connection meters at regular fixed intervals informs a utility about how much water is being lost. All meters, especially older meters, need to be tested on a regular basis for accuracy and replaced when appropriate. *The Crossville Water District (CWD) has universal metering.*

Submetering. Every household and business should have its own meter rather than one meter for a multi-unit complex so that tenants can be billed for the water they actually use rather for a percentage of the total water use for the complex. Individual users are more aware of their water use and cost. Submetering can reduce water usage of a complex by 40%. *CWD does not promote submetering.*

Water Accounting: Water conservation begins on the supply side. *(Practiced by CWD.)*

- Unmetered water (nonaccount water) includes authorized water use by the utility for maintenance purposes and public uses such as fire hydrants. It also includes unauthorized uses - malfunctioning distribution systems, thefts, inaccurate meters, or leaks.
- All water systems need to maintain a system of water accounting to develop strategies for loss control. Accuracy of the analysis improves as sources and connection metering improves.
- *CWD has a 25% unidentified water loss and believes that most of that loss is due to faulty meters. It recently received a substantial grant for a meter replacement program. The water industry goal for unaccounted water loss is 10%.*

Leak Detection: Repairing leaks controls the loss of water that utilities have paid to obtain, treat, and pressurize. The early detection of leaks reduces the chance that leaks will cause major property damage. Leak detection programs are especially important and cost effective in cities that have large, old, and deteriorating systems. Repairing larger leaks may be costly but can lead to substantial savings in system

costs over the long run.

- Nonaccount water use should be analyzed to identify potential way to produce utility revenue or recover losses and leaks. Water previously given away for public use can be metered. Utilities can crack down on water thefts.
- Water utilities can develop programs to detect leaks, largely done these days with advanced technological leak detection devices. These leaks then need to be repaired. Utilities are moving toward automated sensors and telemetry for ongoing system monitoring and early detection of malfunctioning equipment and leaks. ***CWD is developing a digitized program to identify all the lines and repaired leaks to improve its maintenance program.***
- Loss-prevention programs include efforts to improve the distribution system and prevent leaks and ruptures from occurring. Utilities also look at ways to appropriately minimize their use of water used in routine system maintenance procedures.

CWD has 120 miles of distribution pipes. The oldest lines are cast iron and were installed in 1928 along Main Street and the immediate area. They will be replaced as part of the Downtown Crossville renovation. CWD repairs leaks as they are found.

Pricing: Rate structure can encourage water efficiency. Customers use less water when they have to pay more for it. Water conservation rate structures avoid the costs of overt regulation, restrictions and policing while retaining a greater degree of individual freedom of choice for water customers. ***(CWD has the same rate for all volumes and customer classes.)***

- **Decreasing Block Rate Pricing** can encourage water use as consumers pay less for the more water they use.
- **Increasing Block Rates Pricing** reduces water use by increasing per-unit charges for water as the amount customers use increases. The prices must increase significantly to overcome the effects of conservation.
- **Time of Day Pricing** charges users relatively higher prices during a utility's peak-use periods. Because customers are sensitive to price increases, these charges curtail demand. Time-of-day pricing cuts needed water supply and avoids the costs of obtaining more water supply to meet peak demand.
- **Water Surcharges** impose a higher rate on excessive water use. The customer pays more money per gallon for water uses that are considered higher than average.

Public Education is essential to a successful water conservation program and can change water-use habits by informing the public how water is delivered to them, the costs of water service, why water conservation is important, and how to participate in conservation efforts. Educational programs tend to be more effective during times of water scarcity. ***CWD does not have a public education program.***

- **Understandable water bills** identify the volume of water usage, rates and charges, and other relevant information. Utilities can go beyond this basic information and compare previous bills and offer tips on water conservation. Bills that are mailed in an envelope can include inserts with more in-depth information.
- **Information available:** Many utilities provide information pamphlets to customers on request. Informed customers are more likely to cooperate in sound water management practices. An information and education program explains to water users all of the costs involved in supplying drinking water and demonstrate how water conservation practices provide water users with long term savings.
- **School programs** can help socialize youth about the value of water and conservation

techniques. When students take this information home, the parents can learn as well. **Community education** outreach methods include speakers, booths at public events, printed and video material, and coordination with civic organizations.

- **Industry workshops** can gain cooperation in water conservation efforts. Audiences include plumbers, fixture suppliers, builders, landscapers, and other large water users.
- **Advisory committees** involve the public in the conservation process. The group should represent the community leadership who can help develop and carry out a water conservation outreach program.
- **Demonstrations of techniques** and technologies show the community how water efficiency and water conservation actually work.

Level 2 Water Conservation Measures

Water-Use Audits provide water systems and customers with information about how water is used and ways to reduce usage through specific conservation strategies. Trained water auditors visit homes and businesses to identify water conservation opportunities and to recommend changes and water use practices. Audits could be done with electric power companies or others interested in promoting conservation practices. *CWD does not offer water audits.*

- **Large-landscape audits** of irrigation practices provide information about usage and reduction techniques.
- **Selective end-use audits by customer class.** An audit program can target customer groups that have particular needs for which water conservation, such as owners of older housing. An audit can identify and fix plumbing leaks. End-use audits target usage practices within user groups. For example residential water audits may focus on lawn and landscape water practices and customer behavior.

Retrofits Programs are cost-effective and useful in conserving water as they replace existing plumbing equipment with more efficient equipment. Retrofit programs are permanent, one-time conservation measures that are implemented with little or no additional cost over the lifetime. *CWD does not have a retrofit program.*

- **Retrofit education programs** let users know which fixtures are best, where to get them, and how to install them.
- **Retrofit Kits** are made available by many water districts free or at cost and are distributed directly by the utility, through audit programs or through community organizations. A basic retrofit kit includes low-flow faucet aerators, low-flow showerheads, leak detection tablets, and replacement flapper valves.
- **Targeted programs** address the needs of different customer classes. The most successful water-saving replacement fixtures operate in the same manner as the fixtures they replace.

Pressure Management. Reducing water pressure can decrease leakage amounts of flow through open faucets and stresses on pipes and joints which may result in leaks, as well as reduce the wear on end-use fixtures and appliances. Lower pressure also benefits the water utility by extending the life of the current distribution system and treatment facilities. Strategies include reducing residential pressures to 80 psi and installing flow restrictors on service meters. *High water pressure is not a problem for CWD.*

Landscape Efficiency. Outdoor water use drives peak demand which in turn drives the requirements for a water district's capacity to meet that demand. Outdoor water use can be reduced through efficiency-oriented landscaping principles. *CWD does not promote landscape efficiency.*

- Water districts can promote landscape efficiency in the planning, development, and

management of new large landscape projects (recreational areas, building grounds, and golf courses), large-lot residential owners, and local nurseries.

- Xeriscaping is a water-efficient landscaping approach that encompasses planning and design, limited turf areas, efficient irrigation, soil improvement, mulching, use of lower water demand plants, and appropriate maintenance.
- Utilities can encourage large volume irrigation customers to use meters, timers, and water-sensing devices.

Level Three Measures

Replacements and Promotions (*Not offered by CWD*)

- To accelerate the replacement of older fixtures, utilities can offer rebates or encourage suppliers to provide fixtures at reduced prices.
- Municipal utilities can change their building codes to require high efficiency fixtures.
- Utilities can promote new technologies through demonstrations and pilot programs, such as high efficient toilets and washing machines. The US EPA's Water Sense certification program identifies highly efficient water fixtures.

Reuse and Recycle: Gray water is treated wastewater (not "black water" from toilets) that is reused for nonpotable water uses - primarily in industry and large-volume irrigation. Water reuse programs need to identify water reuse opportunities, to determine the minimum water quality needed for the given use, and to identify water sources that could be used and how to transport it to the new use. (*Not offered by CWD*)

Water-Use Regulations

- Manage water use during droughts or other water-supply emergencies. (*CWD does have a drought management program.*)
- Non-emergency water management regulations include standards for water-using fixtures, bans on restrictions on once-through cooling, bans on non-recirculating car washes, laundries, and decorative fountains, and bans on certain types of water use practices. (*CWD does not have such regulations.*)
- Requirements for new developments to impose standards for landscaping, drainage, and irrigation practices. (*CWD does not have such standards.*)

Integrated Resource Management joins water conservation with the conservation of other resources. Land management practices conserve watershed resources while protecting the water supply. Water and wastewater utilities can work together to realize savings and share in the benefits. Water and energy utilities can conduct comprehensive end-use audits and jointly promote conservation practices by customers. *The City of Crossville is developing a habitat conservation plan.*

Resources: USEPA: How to Conserve Water and Use It Effectively; USEPA Water Conservation Plan Guidelines; private communication with Water Supply Division of TDEC.

The Obed Community Association has as its purpose community appreciation and volunteer involvement in ongoing appreciation for our natural and cultural heritage of the Obed River watershed within Cumberland County. Louise Gorenflo, OWCA community educator, produced this fact sheet. Those wanting to join this membership organization or more information may contact Dennis Gregg, director, OWCA at 484-9033 or at 185 Hood Drive, Crossville, TN 38555.