

BEST MANAGEMENT PRACTICE: WATER CONSERVATION

RESIDENTIAL WATER AUDITS

A water use audit program can be an effective method of reducing both indoor and outdoor water use. Consumption audits provide water systems and their residential customers with information about how water is used and help identify potential conservation strategies.

While utilities often offer them to all customers, high water-using customers are usually targeted first. The most successful audit programs also include replacing inefficient showerheads and faucet aerators with new devices and one-on-one interaction with homeowners. Utility staff can carry out the audit; audit services can also be contracted out. Audits typically take about an hour to complete, although audits of larger homes and properties may take longer.

IMPLEMENTATION

Utilities should develop and implement a plan to market water use audit surveys to the selected customer base. Notification of the initiative can be offered by mail, telephone calls, email, utility bill stuffers, or other appropriate methods of communication – depending on the scope of service as determined by the utility. The purpose of the water audit (e.g., to help reduce water and sewer bills, preserve water resources, and identify leaks and inefficient water use) should be included when communicating with homeowners. The steps listed below are typical components of residential audits. However, depending on their particular needs, utilities may wish to stress certain aspects of the audit.

1. **Determine water consumption.** This can be done by counting key water-using appliances and estimating their age, as appropriate (toilets, clothes washers, showerheads, dishwashers and other indoor and outdoor uses). General water consumption can be calculated for the fixtures by using the maximum allowable flow rate under the U.S. Energy Policy Act of 1992 (EPAAct). Flow rates from showerheads can be measured directly by collecting water in a bucket for 15 seconds and multiplying it by four. Other factors to include in a household's water consumption is the number of occupants, frequency of baths/showers, the number of loads of laundry washed each week. Outdoor water use can be estimated by comparing winter water meter readings to summer.
2. **Check for leaks.** Use dye tablets to check for leaking toilets. Auditors can either recommend repairs or, if they are a simple adjustment, perform it themselves. Faucets, showerheads, and outdoor hose bibs should be visually inspected for drips or leaks. Homeowners should be instructed on how to read their water meter, and how to use it to check for leaks.

As a tool to identify leaks, utilities should consider formatting bills to illustrate historical use to customers.

3. **Provide retrofit devices.** Auditors should install or provide water-efficient devices as needed. These can include:
 - Low-flow showerheads – EPAAct states shower heads can use no more than 2.5 gallons per minute at 80 psi. There are many showerheads available with lower flow rates. Some New England states provide grants to water suppliers for retrofit devices.
 - Faucet aerators
 - Automatic hose shut-off nozzles

- Rain gauges and soil moisture probes – These don't directly reduce water use, but homeowners can be instructed on their use to help them use water more efficiently outdoors.

4. **Evaluate outdoor water use.** Auditors should note the presence of an automatic irrigation system. If present, they should check the controller to the frequency of operation, as well as the presence and functionality of a rain sensor. A fairly accurate water consumption rate can be calculated by reading the water meter before and after operating each zone for a set time. Misaligned sprinkler heads that direct water to unwanted places (e.g. sidewalks and driveways) should be noted as well as unusually wet or dry spots. Auditors should also note the condition of the landscape and lawn, checking for soil compaction, thatch, brown spots and general plant condition. Since New England receives approximately 40 inches of rainfall a year, homeowners should be instructed to water lawns when needed, as opposed to a set schedule. Some utilities may opt to offer in-depth irrigation audits, which is not covered by this BMP. Auditors should advise customers on water-efficient landscaping practices, whether they use automatic irrigation or manually water their lawns and gardens,

Other outdoor water uses, such as pools, spas, and water features (man-made ponds and fountains) should be evaluated for leaks and general operation. Covering pools and spas limit evaporation, and some water features recirculate the water.

5. **Identify and evaluate water efficiency opportunities.** Provide customers an easy-to-understand written report that includes a list of findings from the audit and a list of conservation measures. Auditors should also determine a simple payback period for measures requiring larger, upfront costs, (e.g. replacing old toilets or purchasing a new clothes washer). Some utilities offer rebates for upgrading older models as an added incentive. Conservation measures not requiring new fixtures or appliances, but are dependent on habits, such as taking shorter showers, should also be discussed.
6. **Homeowner follow-up.** To ensure that the water-efficiency measures recommended during *and* after the audits are achieved, utilities should follow-up with customers to determine which measures they actually implemented and to gauge customer satisfaction with the performance of water-efficient products. Utilities can also consider a notification process to remind customers of the need for maintenance and adjustments in irrigation schedules and to check toilets and faucets for leaks.

COST CONSIDERATIONS

Costs associated with the following program components need to be taken into consideration when evaluating the cost-effectiveness of a water use audit program:

- Labor costs for consumption audits (performed by utility staff or by contractors).
- Water-efficient devices distributed during the audit
- Administrative and overhead costs in association with marketing, scheduling, day-to-day operations, Tracking, reporting, follow-up (performed by utility staff or by contractors).
- Rebates on low-flow appliances, such as toilets, clothes washers, and irrigation system rain sensors.

Note: *State and federal grant monies may be available to offset some of the costs associated with various water conservation initiatives, including rebates and devices. Manufacturers and local retailers of water-efficient appliances might be willing to provide fixtures at or below costs.*

**Vickers, Amy. Handbook of Water Use and Conservation: Homes, Landscapes, Businesses, Industries, Farms (WaterPlow Press, 2001), pp [20-21]. Used with permission. See Appendix E for a comprehensive sample worksheet for conducting a residential water audit.*