



AQUARION
Water Company

Stewards of the Environment

Commercial/ Industrial Water Use Survey Kit

***A Guide To Assist You
In Managing Your
Business's Water Use.***



For many operation managers, conducting a comprehensive water use analysis and then developing a water conservation plan is a daunting task. However, this survey form will make the job easier by helping you determine where water is used (or wasted) in your facility so you can complete your water conservation plan.

HELPFUL WATER CONSERVATION TOOLS

There are tools to help you determine flow rates, detect and fix leaks, and calculate flush volumes. Here are some examples that will help you save water without sacrificing performance.

Leak Detection Tablets

Leaking toilets can be one of the biggest water-wasters in your facility, losing hundreds of gallons of water a day. Catch those leaks with these dye tablets; just drop a tablet in the tank and wait 15-30 minutes without flushing. If the dye appears in the bowl, the toilet is leaking and the flapper valve needs replacing.

Toilet Tummy

The Toilet Tummy saves a half-gallon of water every time the toilet is flushed. Fill the bag with tap water and place it in the toilet tank between the wall and the intake valve (make sure it doesn't interfere with the flushing mechanisms. Note: This device is not meant for use in the 1.6 gallons-per-flush toilets.

Flush Volume Estimator

Toilets installed after 1994 use the current efficiency standard of 1.6 gallons; older toilets use 3.5 gallons or more per flush. A flush volume estimator will measure how many gallons a toilet uses.

Shower/Faucet Flow Bag

Use this measuring device to determine the flow rate at showers, faucets, water fountains, etc. Place the flow bag over the showerhead or tap and hold it tightly with one hand. Run the water at full volume for exactly five seconds. Note the water level in the bag as measured in gallons per minute (gpm). Repeat a couple of times to be sure of your result.

Drip Gauge

Little leaks add up fast! To determine how much water is leaking from a shower or faucet, hold the gauge under the drip for exactly five seconds and then hold the gauge at eye level to see the amount.

Faucet Valve Re-Seater

Fix compression-style faucet valves with a valve re-seater. Economically repairs old faucets, stops leaks and saves water.

Super Saving 1.0 gpm bath aerator

Unscrew old faucet attachment. For inside threaded faucet, install as is. For outside threaded faucet, first remove top washer to expose inside threads and install. Hand tighten; do not over-tighten. If you use a wrench, protect finish with a cloth.

Kitchen Aerator With On/Off

Unscrew old faucet attachment. For inside threaded faucet install as is. For outside threaded faucet first remove top washer to expose inside threads and install. Hand tighten, do not over-tighten. If a wrench is used, protect finish with a cloth. Use lever to reduce water flow to a trickle and resume full flow without remixing the hot and cold. The trickle is a design feature to prevent scalding.

The following Survey Sheets will help you determine where the water goes so you can make a comprehensive, effective and money-saving water conservation plan.

FACILITY INDOOR WATER USE SURVEY/ANALYSIS

The first step in developing a water conservation plan is to analyze where water is used in your facility. Use a Flush Volume Calculator to determine the approximate gallons per flush for tank toilets. Use the Flow Gauge Bag to determine the approximate gallons per minute for faucets, showerheads, spigots, hoses and water fountains.

Included are some estimates for the average flush volume for flush valve-style toilets and urinals. In addition, you will need to estimate things like flushes per week, minutes per week for faucets, and time and number of showers per week.

Toilets	Qty	Gallons/flush	Flushes/ week	Gallons/ week	Gallons/year
Tank style					
ULFT toilets (1.6 Gallon flush)					
Flush valve style		4.0 gal. average			
Urinals		1.5 gal. average			
Total gallons per year					
<i>Toilet Retro-fit target</i>		<i>1.6 gal</i>			
<i>Urinal Retro-fit target</i>		<i>1.0 gal</i>			
Retro-fit gallons per year					
Retro-fit gallons saved per year (subtract retro-fit gal. from current total gal. per year)					

Sinks	Qty	Gallons/min.	Minutes/ week	Gallons/week	Gallons/year
Bathroom sink					
Kitchen sink					
Cleaning room/ slop sink					
Lab sink					
Total gallons per year					
<i>Bathroom retro-fit target</i>		<i>.5 to 1.0 gallons</i>			
<i>Kitchen retro-fit target</i>		<i>2.5 to 2.0 gallons</i>			
Retro-fit gallons per year					
Retro-fit gallons saved per year (subtract retro-fit gal. from current total gal. per year)					

Showers	Qty	Gallons per minute	Minutes per shower	Showers per week	Gallons per week	Gallons per year
Single shower						
Shower column w _____ heads						
Total gallons per year						
<i>Shower retro-fit target</i>		<i>2.5 to 2.0 gallons</i>				
Retro-fit gallons per year						
Retro-fit gallons saved per year (subtract retro-fit gal. from current total gal. per year)						

Water Fountains	Qty	Gallons/min.	Minutes/week	Gallons/week	Gallons/year
Water Fountains					
Water Cooler		NA			
Total Gallons per year					

Hand Washing Station

Eye Wash	Qty	Gallons/min.	Minutes/week	Gallons/week	Gallons/year
Hand Washing					
Eye Wash					
Other					
Other					
Total gallons per year					

Process and Facilities Water Use

Volumetric Uses	Use/Purpose	Size (Gal.)	How often filled/ turned over	Gallons/week	Gallons/year
Tanks					
Other _____					
Other _____					
Other _____					
Total gallons per year					

Flowing Water Uses- Intermittent	# of machines	Flow Rate/ Use per batch	Batches/Day	Gallons/week	Gallons/year
Rinsing or cleaning equipment					
In house laundry facilities					
Batch processing equipment					
Other					
Other					
Total gallons per year					

Flowing Water Uses- Continuous	# of machines	Flow Rate	Hours/day	Gallons/week	Gallons/year
Once through cooling or flushing					
Cooling towers for AC or processes					
Other _____					
Other _____					
Total gallons per year					

General-Outdoor Water Use

Outdoor Landscaping	Square Feet
Green lawn	
Ornamental flower beds	
Ground cover	
Xeriscape low water use plantings	
Vegetable garden	

Outdoor Water Ornaments	Square Feet	QTY
Fountain		
Reflecting Pond		NA

Outdoor Irrigation	Zones	Inches/hour	Hours/week	Inches/week	Inches/year
In ground irrigation					
Hose fed sprinklers	NA				
Total inches per year					
Target inches per year (June, July, August, Sept watering)					12 Inches
Savings with watering management (Subtract target inches per year from current total inches)					

Outdoor Water Maintenance	Qty	Gallons/wash	Washes/week	Gallons/year
Car/truck wash stations				
Hose valves with hose				
Total gallons per year				

INDOOR WATER CONSERVATION PLANNING

First things first — look for leaks. Some are obvious; others are not. One way to check is to shut off all water consuming devices and look at the water meter. If the meter is still moving, then there is a leak. It has to be found and repaired, because that lost water is costing your company money.

Leak-detecting dye tablets are an easy way to see if your tank-style toilet has a silent leak. Simply drop a tablet in the tank. If the water in the bowl turns blue, then you have a silent leak. Most likely the flapper needs to be changed.

For obvious leaking faucets and showers, a leak quantifier can help you determine how much water is being wasted over a period of time. Little leaks can waste a huge amount of water.

After you've resolved all the water-wasters, you can consider some water conservation upgrades. Low-flow faucet aerators, showerheads and ULFT toilets can save considerable amounts of water. In addition, toilets can be upgraded with water-saving flappers or other devices that will save water with every flush.

Leaks	QTY	Water loss estimate per week	Date repaired	Gallons saved per week	Gallons saved per year
Faucet					
Toilet					
Shower					
Other					
Total gallons saved per year by fixing leaks					

PROCESS AND FACILITIES WATER CONSERVATION

Process water conservation involves the way your facility uses water in the production of the goods or services. Again, first look for and fix leaks. Equipment and processes that use water continuously require extra scrutiny. In particular, identify and evaluate any process or machine that uses once-through water cooling or flushing. Do these have to be continuous? If the answer is yes, are there opportunities to recycle this water?

Air conditioning and process cooling towers are notorious water wasters. Are these units running efficiently? Can you get by with less water use? Often, a considerable amount of water and thousands of dollars can be saved by blow-down (bleed-off) minimization through proper water treatment. You may consider employing the services of a qualified water treatment company.

Identify equipment, machines, or processes that use water intermittently or on a burst-flow basis. These can include equipment that is used for cleaning, rinsing or bathing materials, laundry and dishwashing equipment. For this type of equipment, look at how often the facilities are used and whether the water flow only coincides with the equipment use. Can you get more output per batch/load? Can you get by with lower flow rates?

Another process area to consider is water used for volumetric purposes — that is, filling tanks, vessels and other water-using equipment. How many of these does your facility have? How large are they and, most importantly, how often are they filled, or is the water completely turned over in the system? Some things to consider: Are the tanks or vessels sized right for the need? Must you refill or turn the water over as often as you do? Are there ways water can be recycled in the system to reduce the amount of water used to refill or replenish the system?

These areas are not meant to be an exhaustive list of how water is used in industrial and commercial facilities, or how different customers may pursue water conservation planning. It's meant as a guide to help you identify and consider how water is used in your facility. For more information you can contact the following:

Association of Water Technologists, at www.awt.org

U.S. Environmental Protection Agency, Office of Water, at www.epa.gov.OW

American Water Works conservation site (WaterWiser), at www.waterwiser.org

OUTDOOR WATER CONSERVATION PLANNING

Again, first things first: look for leaks and repair them. Hoses, sprinklers and sprinkler systems are all prone to leaking. Some of the leaks are obvious, and some may be hard to find. Use a drip-measuring vial to see how much water you are losing. Hose menders and washers are available at your local hardware store. You can determine if you have any hidden leaks by shutting everything off inside and outside your facility. Then check to see if the water meter is running. If it is, you have a leak and should search until you find it and repair it.

Outdoor Water Conservation often is guided by your landscaping and outdoor water use habits. It is important that you learn how much water your irrigation system delivers and then manage your watering. Most lawns require no more than 1 inch of water every 8-10 days. That includes rainfall. Use some small cans and a ruler to determine how many inches of water per hour your system delivers. Place 3 cans randomly under your sprinkler, run the sprinkler for exactly 15 minutes, and then measure the depth of water in each can with a ruler. Fill in the results below.

	Amount in Inches	Average output in inches
Measure 1		
Measure 2		
Measure 3		

LAWN WATERING GUIDE

Now that you know how much water your sprinkler applies, use the chart below to estimate how long to water.

Average depth in cans after 15 minute test period

	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"
Spring	41	29	23	19	17	15	13
Summer	53	37	29	24	23	19	17
Fall	29	21	17	15	13	12	10

Watering time in minutes

OBSERVE YOUR LAWN

If your lawn does not look like it needs to be watered, don't water it. If you see pooling of water, stop watering and allow the water to soak in. You may need to break your watering time into several shorter periods to avoid water run-off. Adjust your sprinklers to minimize overlap. Finally, if you see that you are watering driveways and sidewalks, adjust your sprinklers so that only the lawn gets water.

LAWN CARE

Keep the grass tall. Grass height should never be less than 2½". A lawn mowed to a height of 3" to 3½" will have a better chance of surviving dry conditions.

Reduce the turf area of your landscaping. This can be achieved by cutting drought-tolerant plants into the turf areas and using railroad ties or stone as borders. You also can replace turf areas with stone, slate or textured cement patios. Plant low-water demanding plants in the beds, and use mulch to reduce water loss due to evaporation. Use the Selection Guide to Drought-Tolerant Plants to help in your landscape planning.

Selection Guide to Drought-Tolerant Plants**

<i>Shade Trees</i>	<i>Small Trees</i>	<i>Evergreen</i>	<i>Shrubs</i>	<i>Grass</i>
Red Maple	Amur Maple	White Fir	American Holly	Tall Fescue
Hackberry	Mimosa	Norway Spruce	Japanese Holly	Zoysia
Green Ash	Gray Birch	Colorado Spruce	Dense Yew	
Ginkgo	Witchhazel	White Pine	Chaste Tree	
Amur Cork Tree	Goldenrain	Scotch Pine	Red Cedar	
White Oak	Crabapple	Atlas Cedar	Mugo Pine	
Scarlet Oak	Jap. Tree Lilac		Adams Needle	
Red Oak	Blackhaw Viburnum		Anthony Water Spirea	
			Pfizer Juniper	
			Wintergreen Barberry	
			Glossy Ableia	

***Landscaping for Water Conservation: A Guide for New Jersey* by Theodore Shelton, Ph.D. & Bruce Hamilton, Ph.D.

CALCULATE THE VALUE OF THE SAVINGS

Water conservation comes from two general areas. One is fixing leaks and adjusting habits. The leak-repair component will save water immediately and continue to save water as long as leaks are searched out and repaired immediately. Changing habits can save water, but habits easily can drift back to old water-wasting ways. Both leak maintenance and changing habits are important components to a sustained water conservation effort and require constant diligence.

The other way to achieve water conservation is to make upgrades to existing water using fixtures and equipment. This requires research into alternative equipment and fixtures. Evaluate their cost and calculate the dollar value of the savings over time. Upgrades can pay for themselves in 2-3 years and continue to make contributions to the “bottom line” for years to come.

WATER SAVINGS

To determine the value of your target savings, convert your irrigation “inches” saved to CCFs (Hundreds of cubic feet of water) and your process water gallons saved per season to CCFs, and multiply by the rate for the season. Do this calculation for Summer and Winter and then add for your annual savings.

	Square ft of lawn × Inches water saved	x	.000833	x	Summer: \$3.35/CCF	=	\$ Dollar savings	
Outdoor irrigation								
	Gal. saved (May 1 - August 31)	÷	750 gal. per CCF	x	Summer: \$3.35/CCF	=	\$ Dollar savings	
Process water summer								
	Gal. saved (Sept 1 - April 30)	÷	750 gal. per CCF	x	Winter: \$2.24/CCF	=	\$ Dollar savings	
Process water winter								
Annual Savings								

ENERGY SAVINGS

If the water you are saving is heated (or cooled), there can be considerable dollar savings from the energy saved. You will need to measure the temperature of the incoming water and the temperature to which the water is heated or cooled. Then you need to know what fuel you use to heat or cool the water, and how much the energy costs.

See the chart on the next page

	(Gallons of water	x	8.33	x	Number of degrees)	÷	3413 BTU/ KWH	x	Cost KWH	=	\$ dollar savings Electric energy
Electric energy											
	(Gallons of water	x	8.33	x	Number of degrees)	÷	100,000 BTU/ Therm	x	Cost Therm	=	\$ dollar savings Gas energy
Gas energy											
	(Gallons of water	x	8.33	x	Number of degrees)	÷	132,000 BTU/ Gal of oil	x	Cost Gal of oil	=	\$ dollar savings Oil energy
Oil energy											

OTHER CONSIDERATIONS

Saving water can save money elsewhere in your organization. Things to consider are cost of pumping, sewer assessments and reducing process by-products that can be costly to discard. You also may find that more efficient water use can save on production labor.

ADD UP ALL THE SAVINGS

You may find that there are substantial dollar savings associated with water conservation. Start saving today. You will increase your business profit and help preserve this important natural resource.