

## WaterSense® Simple Water Assessment Checklist for Commercial and Institutional Facilities

Use this checklist to identify potential projects and best management practices that will save water, energy, and operating costs. Use <u>WaterSense</u> <u>at Work: Best Management Practices for Commercial and Institutional Facilities</u> to find more information and equations to calculate potential water, energy, and cost savings. This information can be used to prioritize projects and create an action plan for reducing water use in a facility. Water efficiency projects and practices that are shown in **blue** represent low- and no-cost actions to save water.

	Water-efficient Project or Practice	Section of WaterSense at Work <sup>1</sup>	Evaluate ✓	Implement ✓	Done ✓	Notes			
Gen	General Facility Water Management—Monitoring and Education								
1.	Read water meters and record monthly water use; verify that all meters and submeters are installed properly.	2.2							
2.	Track water and cost savings over time in ENERGY STAR®'s Portfolio Manager® or another utility management system.	1.2, 2.2							
3.	Install submeters on all major water-using equipment, systems, or processes (e.g., cooling towers, tenant spaces, irrigation systems, single-pass cooling, and HVAC systems).	2.2							
4.	Include leak detection and repair in all operation and maintenance (O&M) programs.	2.3							
5.	Instruct staff and visitors with clear signage on how and where to report leaks at all points of water use.	2.3							
6.	Educate facility staff, building occupants, employees, and visitors on water management program goals and initiatives.	2.4							
7.	Incorporate water-efficient best management practices (BMPs) into all Standard Operating Procedures (SOPs) for O&M throughout the facility (including those for both maintenance and cleaning staff).	2.4							
8.	Form a green team to engage employees in saving water throughout the building.	2.4							

<sup>&</sup>lt;sup>1</sup> U.S. Environmental Protection Agency. October 2012. *WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities*. <u>www.epa.gov/watersense/docs/ws-at-work\_bmpcommercialandinstitutional\_508.pdf</u>.



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9.	Incorporate water efficiency criteria into procurement policies along with energy efficiency (e.g., ENERGY STAR certified and WaterSense labeled products).	2.5				
10.	Educate employees to turn off equipment including all continuous flow equipment, between uses; use automatic shut-off valves where applicable.	_				
11.	Educate employees to use "dry" cleaning methods to avoid washing down equipment or areas with a water hose or mop; sweep or mop instead of spray washing with water.	_				
12.	Test water pressure regularly on each floor of the facility to ensure it is within optimal range for fixture and equipment performance; use pressure regulating valves to correct any issues (i.e., optimal pressure is between 20 and 80 psi for most fixtures).	_				
Sanit	ary Fixtures and Equipment		_			
13.	Regularly check all fixtures and valves for scaling and clean as needed.	3.2 - 3.5				
14.	Test and calibrate all automatic- and sensor-flushing devices regularly to prevent double/phantom flushes.	3.2 - 3.3				
15.	Check tank-type toilets for leaks, broken flappers, and other parts failures regularly.	3.2				
16.	Display instructional signage with all dual-flush devices to ensure proper use.	3.2				
17.	Replace old tank-type and flushometer-valve toilets with WaterSense labeled models, which flush at 1.28 gpf or less.	3.2				
18.	Replace old flushing urinals with WaterSense labeled models flushing at 0.5 gpf or less.	3.3				
19.	Check and adjust automatic sensor and metering faucets regularly to ensure accurate timing and delivery of water per cycle.	3.4				



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20.	Replace all lavatory faucets or faucet aerators in <b>private-</b> <b>use restrooms</b> (e.g., hotel guest rooms, dorms, and hospital patient rooms) with WaterSense labeled models, which flow at 1.5 gallons per minute (gpm) or less.	3.4				
21.	Replace old lavatory faucets or faucet aerators in <b>public-use restrooms</b> with 0.5 gpm models or metered faucets that deliver no more than 0.25 gallons per cycle.	3.4				
22.	Replace old showerheads with WaterSense labeled models, which flow at 2.0 gpm or less.	3.5				
23.	Only wash full loads of laundry.	3.6				
24.	Program clothes washers to use the lowest amount of water, detergent, and chemicals necessary.	3.6				
25.	Evaluate wash cycles and detergent/chemical formulation for maximum efficiency (least number of wash and rinse cycles).	3.6				
26.	Retrofit clothes washers with water reuse or recycling systems.	3.6				
27.	Retrofit clothes washers with ozone injection systems.	3.6				
28.	Replace old single-load clothes washers with ENERGY STAR certified models or consider a lower water factor when purchasing larger commercial or industrial-sized laundry machines.	3.6				
Com	mercial Kitchen Equipment					
29.	Place signage at all major points of water use to remind employees to turn off the tap and report leaks.	4.1				
30.	Shut down or use standby mode for all continuous flow equipment between uses.	4.2 - 4.11				
31.	Install automatic shutoffs so water doesn't run when garbage disposal or faucets are not in use.	3.4, 4.9				



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32.	Do not use running water to melt unwanted ice or thaw frozen food; instead thaw frozen food in a refrigerator, microwave or water bath.	4.1				
33.	Install aerators on all kitchen handwashing sinks.	3.4				
34.	Regularly check faucets, dishwashers, steam equipment, and other kitchen equipment for leaks.	4.2 - 4.11				
35.	Eliminate or replace ice machines that are cooled with single-pass cooling water; retrofit to distribute chilled water or use an air-cooled model instead.	4.2				
36.	Regularly clean coils on the heat exchange unit of an ice machine to maintain efficiency.	4.2				
37.	Match ice shape and quality to desired uses; use equipment that makes flakes instead of cubes whenever possible.	4.2				
38.	Clean ice machines periodically to remove lime and scale build up and sanitize them to kill bacteria and fungi.	4.2				
39.	Install a timer to shift ice production to nighttime or off- peak hours to reduce peak energy demand.	4.2				
40.	Set ice machine rinse cycles to the lowest possible frequency to provide sufficient ice quality; if available, use a sensor to initiate rinse cycle based on mineral content.	4.2				
41.	Keep lids closed to keep cool air inside ice machines and maintain appropriate temperature.	4.2				
42.	Replace old ice machines with ENERGY STAR certified models.	4.2				
43.	Load steam cookers, steam kettles, and combination ovens to capacity; only use as many compartments as needed.	4.3, 4.4, 4.5				
44.	Keep doors closed and lids secured on all steam equipment while in operation.	4.3 – 4.5				



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45.	Replace gaskets and tighten hinges on steam equipment doors to provide a good seal to retain heat or steam.	4.3 - 4.4				
46.	Use steam and combi-mode sparingly; maximize the use of hot air or convection mode.	4.3 - 4.4				
47.	Turn ovens, cookers, and kettles off or down at slow times or when not in use; use a timer to return to standby mode after use; use standby mode only when necessary.	4.3 – 4.5				
48.	Consider using a condensate return system to reduce potable water needed for make-up water in boiler-based equipment.	4.3 – 4.5				
49.	Switch to connectionless combination ovens, steam cookers, and steam kettles whenever possible.	4.3 - 4.5				
50.	Routinely check equipment cooling water lines for leaks and corrosion; inspect shutoff valves to ensure they are properly functioning.	4.3 - 4.5				
51.	Replace old steam cookers and combination ovens with ENERGY STAR certified models.	4.4				
52.	Replace old water-cooled wok stoves with waterless models.	4.6				
53.	Install in-line flow restrictors to reduce dipper wells' flow rate to 0.3 gpm or less.	4.7				
54.	Install a push-button, metering faucet or undercounter dishwasher to clean utensils instead of using dipper wells.	4.7				
55.	Train employees to use always-on clamps on pre- rinse spray valves only when necessary; encourage employees to report leaks and broken/loose parts.	4.8				
56.	Replace old, inefficient pre-rinse spray valves with WaterSense labeled models, which flow at 1.28 gpm or less.	4.8				



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57.	Hand scrape food from dishes or install food strainers, and use the scraps to compost food waste.	4.9				
58.	Turn off water to food disposal systems during idle periods and when the kitchen is closed; consider installing a timer to stop the flow after 15 minutes, so users must reactivate it periodically.	4.9				
59.	Operate disposal systems to only run cold water to minimize hot water and energy use.	4.9				
60.	Retrofit disposal systems with load sensors that regulates water use based on the disposal motor's load. This can reduce idle flow rate.	4.9				
61.	Replace food disposals with food pulpers or strainers to minimize water use.	4.9				
62.	Extract and recirculate water within the food disposal system to use for pre-rinsing dishes, or use in a sluice trough instead of potable water.	4.9				
63.	Load dishwashers to capacity before running.	4.10				
64.	Run dishwasher close to or at the minimum flow rate and rinse cycle time recommended by the manufacturer; verify that the final rinse pressure and water temperature are within manufacturer recommendations.	4.10				
65.	Ensure manual fill valves close completely after the wash tank is full. Ensure valves and rinse nozzles are inspected and repaired periodically.	4.10				
66.	For conveyor-type dishwashing machines, ensure the rinse bypass drain is adjusted so the wash tank is properly replenished during dishwashing operation.	4.10				
67.	Install wash curtains to retain heat in conveyor-type dishwashing machines; operate conveyor-type machines in auto-mode to save energy.	4.10				
68.	Replace old dishwashers with ENERGY STAR certified models.	4.10				



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69.	Ensure wash-down sprayers have a self-closing nozzle and are shut off when not in use.	4.11				
70.	Use a broom or mop instead of a wash-down sprayer to clean floors when possible. Use pressure washers or water brooms when water is needed.	4.11				
Outo	oor Water Use					
71.	Plant native or drought-tolerant species.	5.2				
72.	Use mulch (3") around trees and plant beds.	5.2				
73.	Hire landscape professionals trained and certified in water-efficient or climate-appropriate landscaping.	5.2				
74.	Incorporate water-, chemical-, and energy-efficient requirements/performance standards into all landscape and irrigation service and maintenance agreements.	5.2				
75.	Maintain 4" to 6" of good topsoil to capture and release precipitation back to plants over time.	5.2				
76.	Balance soil composition with topsoil or compost to restore the soil's water holding capacity and proper drainage.	5.2				
77.	Remove weeds from any irrigated landscape so water is available for the desired landscaping; pull weeds manually instead of using herbicides.	5.2				
78.	Raise the blade on mowers to allow grass to grow longer and more drought-resistant.	5.2				
79.	Consider letting turfgrass turn brown during dry periods if the species will recover when rainfall returns.	5.2				
80.	Plant additional trees and shrubbery to increase the amount of shaded area.	5.2				



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81.	Limit the use of turfgrass to areas with functional purposes (e.g., erosion control, recreation, etc.).	5.2				
82.	Avoid installing "strip grass," or small, disconnected patches of grass, which are hard to maintain and difficult to water efficiently.	5.2				
83.	Group plants with similar irrigation needs together so they can be watered effectively using the technique of hydrozoning.	5.2				
84.	Install WaterSense labeled weather-based irrigation controllers or consider irrigation controllers with rain or soil moisture sensors instead of setting clock timers to water.	5.3				
85.	Use drip irrigation to water plant beds, trees, and shrubs.	5.3				
86.	Ensure irrigation schedule is appropriate for climate, soil conditions, plant materials, grading, and the season.	5.3				
87.	Have an irrigation professional certified by a WaterSense labeled program conduct a full audit of the irrigation system every three years.	5.3				
88.	Inspect and repair all irrigation system parts and components regularly as part of standard maintenance procedures. Repair all broken sprinkler heads immediately.	5.3				
89.	Check the position and location of sprinkler heads to ensure that they are working properly and water is not being directed onto non-landscaped areas, such as sidewalks.	5.3				
90.	Visually inspect the landscape for water pooling or puddling regularly to prevent damage to plants from overwatering.	5.3				



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91.	Don't "Set It and Forget It;" adjust irrigation schedules frequently to reflect actual site conditions, including climate, soil conditions, plant materials, grading, and the season.	5.3				
92.	Adjust the intensity and frequency of watering schedules to fit the soil types and landscape features to encourage deep watering and deep root growth for more healthy plants.	5.3				
93.	Install a separate meter to measure water used for irrigation and monitor it regularly to find leaks and problems.	5.3				
94.	Contact your local wastewater utility to find out if credits are available for the water being applied to the landscape, instead of being discharged to the sewer system.	5.3				
95.	Substitute water from alternative sources for irrigation and decorative water features instead of using potable water.	5.3				
96.	Recirculate water in decorative fountains, ponds, and waterfalls and consider using non-potable water in these systems.	5.2				
97.	Shut off water features when possible to reduce evaporation losses and check water recirculation systems annually for leaks and other damage.	5.2				
98.	Do not hose down sidewalks, driveways, parking lots, tennis courts, pool decks, or other hardscapes; sweep these areas instead, or use a water broom for greater time and water efficiency.	5.2				
99.	Avoid heating pools above 79°F to minimize evaporation.	5.4				
100.	Use pool covers or liquid barriers to control evaporation loss.	5.4				



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101. Reduce water losses from splashing by maintaining the water level a few inches below the top of the pool.	5.4				
102. Install a pool gutter and grate systems along the edges of the pool to reduce losses from splashing and drag-outs.	5.4				
103. Monitor water levels in pools regularly—if a pool is losing more than 2" per week, a leak is likely present.	5.4				
104. Maintain proper pool chemistry to limit pool cleaning and drainage events.	5.4				
Mechanical Systems					
<ul> <li>105. Eliminate all instances of single-pass cooling. Inventory all mechanical systems and mark the equipment that uses single-pass cooling: <ul> <li>point-of-use chillers or other refrigeration systems</li> <li>condensers, air compressors, air conditioners</li> <li>hydraulic equipment, degreasers, welding machines</li> <li>vacuum pumps</li> <li>CAT scanners, X-ray equipment</li> <li>ice machines</li> <li>steam sterilizers</li> <li>wok stoves</li> </ul> </li> </ul>	6.2				
106. Use the minimum flow rate required to cool all mechanical systems as recommended by the manufacturer.	6.2, 6.3				
107. Install solenoid valves to shut off single-pass cooling water when equipment is off.	6.2				
108. Regularly check operation of water control valves so cooling water only flows when heat load needs to be removed.	6.2				
109. Clean coil loops to maximize heat exchange.	6.2				



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110. Retrofit systems to reuse cooling water with an air-cooled point-of-use chiller or by connecting to an existing recirculating chilled water or cooling tower water loop.	6.2				
111. Take advantage of energy-efficiency measures wherever possible to reduce the cooling load on cooling towers and chilled water systems.	6.3 - 6.4				
112. Install and monitor flow meters on the make-up and blowdown lines of cooling towers, boilers, and chilled water systems.	6.3 - 6.5				
113. Hire a treatment vendor with knowledge of water-efficient operation to monitor cooling tower and boiler chemistry and maximize cycles of concentration.	6.2, 6.5				
114. Install a control system to control chemical feed and initiate blowdown based on conductivity.	6.3 – 6.5				
115. Clean conductivity meters and probes monthly to reduce unnecessary blowdown.	6.3 - 6.5				
116. Regularly maintain and clean chillers, air handler coils, heat exchangers, condensers, and evaporator coils to prevent scale, biological growth, and sediment buildup.	6.4				
117. Properly insulate all piping, chillers, and storage tanks.	6.4				
118. Read conductivity meters and make-up and blowdown flow meters regularly to create a detailed log of quantities, conductivity, and cycles of concentration to identify performance problems and make adjustments.	6.4				
119. Include water efficiency requirements in contracts and service agreements with water treatment vendors.	6.3 - 6.5				
120. Ensure water discharged to the sewer meets allowable water quality standards.	6.3 - 6.5				



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121. Read all water chemistry reports produced by water treatment vendor to ensure conductivity and cycles of concentration are within target ranges.	6.3 - 6.5				
122. Regularly check and maintain boilers, steam lines, and steam traps.	6.5				
123. Check steam and hot water lines for leaks regularly.	6.5				
124. Inspect and clean boiler water and fire tubes regularly.	6.5				
125. Recover steam condensate for other uses when possible.	6.5				
126. Temper hot condensate by using expansion tanks rather than adding water to cool it before it is discharged to the sewer.	6.5				
Laboratory and Medical Equipment					
127. Only purify water when necessary. Treat water to a quality that matches the process requirements.	7.2				
128. Program water purification regeneration based on the incoming water hardness and/or flow through the system. Monitor and adjust settings periodically.	7.2				
129. Turn off vacuum pumps and steam sterilizers when not in use and program them to only discharge the amount of water necessary to remove impurities and cool the unit.	7.3, 7.4				
130. Adjust the tempering water needle valve flow rates to the minimum manufacturer recommendations; change needle valves annually.	7.4				
131. Install thermostatically actuated valves to control the flow of cooling water for steam sterilizer condensate discharge.	7.4				
132. Replace old steam sterilizers and vacuum pumps with newer models that do not use single-pass cooling or condensate discharge tempering water.	7.3, 7.4				



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133. Ensure that water flow rates in fume hoods do not exceed manufacturer specifications and recirculating systems do not blowdown or overflow unnecessarily.	7.6						
134. Replace old fume hoods with a filtration system that does not require water (e.g., activated carbon).	7.6						
135. Inspect and repair worn cage-and-rack washer valves and rinse nozzles.	7.7						
136. Run glassware and cage-and-rack washers only when full.	7.5, 7.7						
137. Ensure that water flows in film processors at the minimum acceptable rate specified and is turned off when the unit is not in use.	7.8						
138. Check solenoid valves regularly to ensure flow is stopped when equipment is in standby mode.	7.8						
139. Convert traditional film equipment to digital X-ray equipment.	7.8						
Onsite Alternative Water Use							
<ul> <li>140. Explore all alternative sources of water to be used in place of potable water and mark which are available at your facility: <ul> <li>Rainwater/stormwater</li> <li>Air handler condensate</li> <li>Boiler condensate</li> <li>Water from single-pass cooling equipment</li> <li>Cooling tower blowdown</li> <li>Onsite treated greywater and wastewater</li> <li>Water treatment system reject water</li> </ul> </li> </ul>	8.0						
141. Use onsite alternative water for irrigation, cooling tower make-up, toilet and urinal flushing, fume hood scrubbers, and other uses not requiring potable water.	8.0						
142. Match alternative water sources with the expected uses and verify that the sources will provide consistent water supply and quality.	8.0						



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143. Collect rainwater to irrigate landscapes (where rainwater harvesting is allowed).	8.0				
144. Use air handler condensate as cooling tower make-up to offset potable water use where possible.	8.0				
145. Recycle rinse water in dishwashers and clothes washers whenever possible (e.g., the last rinse water becomes the next load's wash water).	8.0				