WaterSense® Operations and Maintenance Water Waste Checklist for Commercial and Institutional Facilities

Use this checklist to identify potential leaks or losses and maintenance practices that will save water, energy, and operating costs. Use *WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities* to find more information and equations to calculate potential water, energy, and cost savings. This checklist does not include equipment retrofits or replacements. For a comprehensive water assessment checklist and other tools, please visit the WaterSense Commercial Tools web page.

Tips to Identify and Address Potential Water Waste	Section of *WaterSense at Work*[1]	Done ✓	Notes
METERING AND LEAK DETECTION			
1. **Check water meters at times of low activity/occupancy in the building. If the meter is moving, there may be a leak.**	2.2		
2. Track water and cost savings over time in ENERGY STAR® Portfolio Manager® or another utility management system to catch spikes.	1.2, 2.2		
3. Regularly check water submeters that may be installed on major water-using equipment, systems, or processes (e.g., cooling towers, tenant spaces, irrigation systems, single-pass cooling, and HVAC systems) to quickly detect problems. Use temporary flow meters or other monitoring devices to spot-check specific systems or fixtures for malfunctions. By tracking submeters and water monitoring devices over time, you can identify anomalies or leaks.	2.2		
4. Conduct maintenance and testing of leak detection and failure abatement devices as directed by the manufacturer to ensure that they will function when needed. Malfunction or leak alerts should go to multiple employees to make sure they are addressed as soon as possible.	2.3		
5. **Include leak detection and repair in all operations and maintenance (O&M) programs and service contracts.** Check vendor status reports for problems. Make sure that the amount of water used is consistent with your water efficiency goals.	2.3		
6. Place signage on how and where to report leaks at all points of water use (e.g., restrooms, kitchens) to instruct staff and visitors.	2.3		
7. **Educate employees to turn off equipment between uses; especially all continuous flow equipment; use automatic shut-off valves where applicable.**	—		
8. Test water pressure regularly on each floor of the facility to ensure it is within optimal range for fixture and equipment performance (i.e., between 20 and 80 psi for most fixtures). A drop in pressure can indicate a leak.	—		
9. **Cleaning Methods:** Educate staff throughout the facility to use standard operating procedures (SOPs) that save water where feasible, including the use of "dry" cleaning methods (sweeping or wiping instead of mopping or washing down equipment with a hose).	—		

[1] U.S. Environmental Protection Agency. October 2012. *WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities*. www.epa.gov/watersense/best-management-practices.

Tips to Identify and Address Potential Water Waste	Section of *WaterSense at Work*[1]	Done ✓	Notes
SANITARY FIXTURES			
10. Post signs in restrooms to instruct users to report leaks and continuously flushing fixtures.	3.2 – 3.4		
11. **Tank-type toilets:** Check tank-type toilets regularly for leaks, broken flappers, and other parts failures. Annually test toilets using a dye test to ensure the flappers are not worn or allowing water to seep from the tank into the bowl and down the sewer. Drop a dye tablet or several drops of food coloring in the tank. After 10 minutes, see if the dye has leaked into the bowl, which indicates a leak. Flush immediately.	3.2		
12. Check the toilet fill valves for water overflow to make sure fill valves are not running constantly.	3.2		
13. **Flushometer-valve toilets and urinals:** Inspect diaphragm or piston valves annually and replace any worn parts. To determine if the valve needs replacement, time the complete flush cycle. A properly functioning flushometer valve toilet should not have a flush cycle longer than four seconds for a 1.6 gallon per flush (gpf) valve and three seconds for a 1.28 gpf valve. A urinal flush cycle should be completed in three seconds for a 1.0 gpf valve and two seconds for a 0.5 gpf valve. If longer, check the flush volume adjustment screw or consider replacing the valve or valve insert.	3.2 – 3.3		
14. Periodically check to ensure the control stop (which regulates the flow of water from the inlet pipe to the flushometer valve) is set to fully open during normal operation.	3.2 – 3.3		
15. Periodically inspect the flush volume adjustment screw to ensure the flush volume setting has not been modified from the original settings to use more water per flush than needed.	3.2 – 3.3		
16. If replacing valves or valve inserts, make sure the new ones are consistent with the manufacturer's specifications. Ensure the rated flush volume matches the acceptable range for the fixture.	3.2 – 3.3		
17. Test and calibrate all automatic- and sensor-flushing devices regularly to prevent double/phantom flushes.	3.2 – 3.3		
18. Display instructional signage with all dual-flush toilets to ensure proper usage.	3.2 – 3.3		
19. **Faucets:** Periodically inspect faucets to ensure aerators or other flow restrictors remain installed and properly functioning at the intended flow rate. Clean faucet aerators regularly to remove debris, scale, and biofilm.	3.4		
20. Check and adjust automatic sensor and metering faucets regularly to ensure accurate timing and delivery of water per cycle. Flow rate for faucets is measured either by recording the time required to fill a container of known volume or by using a flow-gauge bag (or flow bag).	3.4		
21. **Showerheads:** Check the flow rate of showerheads regularly by recording the time required to fill a container of known volume or by using a flow-gauge bag (or flow bag).	3.5		

Tips to Identify and Address Potential Water Waste	Section of *WaterSense at Work*[1]	Done ✓	Notes
22. Periodically check showerheads to make sure integral flow restrictors have not been removed. Clean showerheads regularly to remove debris, scale, calcium, and biofilm.	3.5		
23. **Clothes washers:** Train staff to only wash full loads of laundry.	3.6		
24. As appropriate, use clothes washer cycles that use the lowest amount of water, detergent, and chemicals necessary.	3.6		
COMMERCIAL KITCHENS			
25. **Place signage at all sinks and near steam equipment to remind employees to shut off when not in use and report leaks.**	4.1		
26. **Shut down or use standby mode for all continuously flowing equipment between uses.** Check all shutoff valves and self-closing nozzles regularly to ensure flow is stopped when equipment is in standby mode or shut down. Extra flow will result in waste.	4.2 – 4.11		
27. Train staff to not use running water to melt unwanted ice or thaw frozen food; instead, thaw frozen food in a refrigerator, microwave, or recirculating water bath.	4.1		
28. **Clean kitchen faucet aerators** regularly to remove debris, scale build up, and biofilm.	3.4		
29. Regularly check faucets, dishwashers, steam equipment, and other kitchen equipment for leaks. Tighten screws and fittings on all kitchen equipment to stop leaks and remove scaling regularly.	4.2 – 4.11		
30. **Ice machines:** Regularly check cooling loops on water-cooled ice machines for leaks. Regularly clean coils on the heat exchange unit to maintain efficiency.	4.2		
31. Match ice shape and quality to desired uses; use equipment that makes flakes instead of cubes whenever possible.	4.2		
32. Keep ice machine lids closed to maintain appropriate temperature and prevent melting and evaporation.	4.2		
33. Clean ice machines periodically to remove lime and scale build-up and sanitize them to kill bacteria and fungi.	4.2		
34. Set ice machine rinse cycles to the lowest possible frequency to provide sufficient ice quality; if available, use a sensor to initiate the rinse cycle based on mineral content. Calibrate the sensor regularly.	4.2		
35. **Steam cookers, steam kettles, and combination ovens: Train staff to load them to capacity**; only use as many compartments as necessary.	4.3 – 4.5		
36. Keep doors closed and lids secured on all steam equipment while in operation.	4.3 – 4.5		

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37. Replace gaskets and tighten hinges on steam equipment doors to provide a good seal to retain heat or steam.	4.3 – 4.4		
38. Use steam or combi-mode sparingly; maximize the use of hot air or convection mode.	4.3 – 4.4		
39. **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. Turn equipment off during long periods of non-use.**	4.3 – 4.5		
40. Routinely check equipment cooling water lines for leaks and corrosion; inspect shutoff valves to ensure they are properly functioning.	4.3 – 4.5		
41. Fix and repair any leaks. Remove any deposit buildup from the boiler on boiler-based models.	4.3 – 4.5		
42. Regularly monitor self-contained steam kettle water levels and maintain temperature control components to ensure efficient operation.	4.5		
43. Make sure the steam kettle lid is secured whenever possible to reduce the amount of energy required for simmering and boiling.	4.5		
44. **Wok stoves:** Turn off wok stove rinse spouts and reservoir taps when not in use. Inspect and ensure the shut-off valves for the rinse spouts and reservoir taps are in working order. Ensure the cooling water is shut off when it's not in use. Routinely check cooling water lines for leaks and corrosion.	4.6		
45. **Dipper wells:** Turn off water when service periods are slow and it is not in use. Keep the flow rate of the dipper well valve at 0.3 gpm or less with in-line flow restrictors. Consider rinsing utensils with a sink faucet or dishwasher, rather than using the dipper well.	4.7		
46. **Pre-rinse spray valves:** Train employees to use always-on clamps on pre-rinse spray valves only when necessary. Encourage employees to report leaks and broken or loose parts. If necessary, tighten screws and fittings to stop leakage. Remove scale buildup regularly to ensure proper flow. Do a timed-flow test regularly to make sure it is working as expected.	4.8		
47. **Food disposal systems: Turn off water to food disposal systems during idle periods** and when the kitchen is closed. Consider installing a foot pedal to activate water flow or a timer to stop the flow after 15 minutes, so users must reactivate it periodically. Check shut-off valves frequently.	4.9		
48. Check and calibrate load sensors and control valves in food disposal systems regularly to maintain optimal water use. Consider scraping food off dishes for compost instead of using the disposal.	4.9		
49. Run cold water through the food disposal system instead of hot water to reduce energy use and keep the system cool.	4.9		

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50. Regularly inspect and clean the food disposal system to make sure the blades are sharp and the system is not clogged with debris. Instruct staff not to pour grease or put hard objects in the disposal.	4.9		
51. 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. Check recirculating loops for leaks regularly.	4.9		
52. **Dishwashers:** Train employees to load dishwashers to capacity before running.	4.10		
53. Run dishwashers 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		
54. Ensure manual fill valves close completely after the wash tank is full. Find and repair leaks. Ensure valves and rinse nozzles are inspected and repaired periodically so they shut off cleanly when in use.	4.10		
55. For conveyor-type dishwashing machines, ensure the rinse bypass drain is adjusted so the wash tank is properly replenished during dishwashing operation.	4.10		
56. Maintain wash curtains to retain heat in conveyor-type dishwashing machines; operate conveyor-type machines in auto-mode to save energy. Heat loss results in wasted energy.	4.10		
57. **Wash-down sprayers:** Ensure wash-down sprayers have a self-closing nozzle and are shut off when not in use. Check and repair nozzles regularly.	4.11		
58. 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		
OUTDOORS			
59. **Landscaping:** Apply mulch (approximately three inches) annually around trees and plant beds.	5.2		
60. Maintain four to six inches of good topsoil to capture and release precipitation back to plants over time.	5.2		
61. Balance soil composition with topsoil or compost to restore the soil's water holding capacity and proper drainage.	5.2		
62. Remove weeds from any irrigated landscape so water is available for the desired landscaping; pull weeds manually instead of using herbicides.	5.2		
63. Raise the blade on mowers to allow grass to grow longer and more drought-resistant.	5.2		
64. Consider letting turfgrass turn brown during dry periods if the species will recover when rainfall returns.	5.2		
65. **Irrigation systems:** Adjust irrigation schedules to be appropriate for actual site conditions, including climate, soil conditions, plant materials, grading, and the season. Don't set it and forget it!	5.3		

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66. If there is a separate meter for irrigation, monitor it when the system is not running. If there is movement, there may be a leak or another problem.	5.3		
67. Contact your local wastewater utility to find out if sewer credits are available for the water being applied to the landscape instead of being discharged to the sewer system.	5.3		
68. **Include regular inspections/audits within landscape and irrigation service and maintenance agreements to prevent leaks and broken equipment.** Have an irrigation professional certified by a WaterSense labeled program conduct a full audit of the irrigation system every three years.	5.3		
69. Inspect and repair all irrigation system parts and components regularly as part of standard maintenance procedures. Check for missing sprinklers, those that do not pop up fully, drip lines that have been cut or moved out of place, or small geysers. Repair all broken sprinkler heads immediately.	5.3		
70. 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. Check hardscapes for cracking, sink holes, or potholes, which can be signs of leaks and overwatering.	5.3		
71. Visually inspect the landscape for water pooling, puddling, or running off regularly to prevent damage to plants from overwatering. Check for dead spots, which are signs of underwatering or problems with distribution.	5.3		
72. Observe the distance of spray from one sprinkler to another; spray from one sprinkler should reach the adjacent one (head-to-head coverage). Adjust the spray distance and direction of the nozzle to ensure head-to-head coverage or contact an irrigation professional if sprinklers need to be added or moved.	5.3		
73. Check sprinklers for fine mist, a possible indicator of high pressure in the system. Check the water pressure to determine if a pressure-reducing valve or WaterSense labeled spray sprinkler bodies with integral pressure regulation are needed.	5.3		
74. **Microirrigation:** Check microirrigation systems for bad spacing or to see if drippers are on bare soil or not right next to plants. Move the dripper lines to the root zone of the plants.	5.3		
75. **Soil moisture sensors:** Look for exposed sensors or areas where soil has been removed. Reinstall sensors and check for damaged wires where applicable.	5.3		
76. **Erosion on slopes:** Look for bare soil or empty patches on slopes. Water at shorter intervals (i.e., “cycle-and-soak”) on steep slopes. Mulch or add plants on slopes to reduce erosion.	5.3		
77. **Water features:** Shut off water features when possible to reduce evaporation losses and check recirculating loops in decorative fountains, ponds, and waterfalls frequently to catch leaks.	5.2		
78. Do not hose down sidewalks, driveways, parking lots, tennis courts, pool decks, and other hardscapes; sweep these areas instead or use a water broom for time savings and water efficiency.	5.2		

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79. **Pools and spas:** Monitor water levels in pools regularly—if a pool is losing more than two inches of water per week, a leak is likely present.	5.4		
80. Avoid heating pools above 79°F to minimize evaporation. Use pool covers or liquid barriers to control evaporation loss when the pool is not in use.	5.4		
81. Reduce water losses from splashing by maintaining the water level a few inches below the top of the pool.	5.4		
82. Maintain proper pool chemistry to limit pool cleaning and drainage events.	5.4		
MECHANICAL SYSTEMS			
83. Use the minimum flow rate required to cool all mechanical systems as recommended by the manufacturer to minimize wasted water. Verify flow rates regularly, as efficiency can decrease over time.	6.2, 6.3		
84. **Install failure abatement devices on all major water-using equipment** and integrate into the building management system. Be sure alerts are sent to multiple employees to quickly fix problems.	6.2 – 6.5		
85. **Regularly check operation of water control valves so cooling water only flows when a heat load needs to be removed.** Install and monitor solenoid valves to shut off single-pass cooling water when equipment is off.	6.2		
86. Clean coil loops regularly to maximize heat exchange.	6.2		
87. 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. Check all recirculating loops for leaks regularly.	6.2		
88. Maximize energy efficiency wherever possible to reduce the cooling load on cooling towers and chilled water systems.	6.3 – 6.4		
89. **Include leak detection and repair requirements in all service contracts.** Make sure treatment vendors are monitoring all lines and connections for leaks, or that leaks are a specific part of their maintenance program.	6.3 – 6.5		
90. Install and monitor flow meters or submeters on the make-up and blowdown lines of cooling towers, boilers, and chilled water systems to detect malfunctions and problems as soon as possible.	6.3 – 6.5		
91. 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. Abnormal readings may indicate a leak.	6.3 – 6.4		

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92. Work with cooling tower and boiler water treatment vendors to maximize the cycles of concentration. Many systems operate at two to four cycles of concentration, while six cycles or more might be possible. When increasing cycles of concentration, ensure that discharged water meets allowable water quality standards.	6.3 – 6.5		
93. Work with the water treatment vendor to add chemicals to the system to control scaling, corrosion, or biological growth. Critical water chemistry parameters that require review and control include pH, alkalinity, conductivity, hardness, microbial growth, biocide, and corrosion inhibitor levels.	6.3		
94. Read all water chemistry reports produced by water treatment vendors to ensure conductivity and cycles of concentration are within target ranges and progress continues towards water efficiency goals.	6.3 – 6.5		
95. Clean conductivity meters and probes monthly to reduce unnecessary blowdown.	6.3 – 6.5		
96. Make sure the tower fill valve cuts off cleanly when the tower basin is full to minimize wasted water from leaks or basin overflow.	6.3		
97. Calibrate the control system regularly to control chemical feed and initiate blowdown based on conductivity.	6.3 – 6.5		
98. Regularly maintain and clean chillers, air handler coils, heat exchangers, condensers, and evaporator coils to prevent scale, biological growth, and sediment buildup.	6.3 – 6.4		
99. Use controls to monitor the capacity of the chiller and turn chillers on or off as necessary, depending upon the cooling demand of equipment connected to each chiller.	6.4		
100. Properly insulate all piping, chillers, and storage tanks.	6.4		
101. Inspect chillers regularly to remove any scale buildup, which can decrease the heat transfer efficiency of the chiller.	6.4		
102. The smaller the temperature difference between the chilled water and condenser water loop, the higher the chiller efficiency. Therefore, raising the chilled water temperature and lowering the condenser water temperature will improve efficiency. Such temperature adjustments can only be made within the constraints of outside conditions. The chilled water temperature will be constrained by the cooling load. A condenser water return temperature 5° to 7°F above the ambient wet bulb temperature is optimal.	6.4		
103. Check steam, hot water, recirculating, and steam condensate recovery lines for leaks regularly.	6.5		
104. Inspect and clean boiler water and fire tubes regularly.	6.5		
105. Regularly check and maintain boilers, steam lines, and steam traps. Implement an annual boiler tune-up program.	6.5		
106. Properly insulate the piping and central storage tank to retain heat.	6.5		

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107. Inspect boiler systems with condensate recovery for leaks in the steam traps. When steam traps exceed condensate temperature, this inspection can reveal whether the trap is leaking condensation. Monitor temperature using an infrared temperature device and repair leaking traps as soon as possible.	6.5		
108. Make sure tempering valves cut off cleanly and are used at the correct times. Consider using expansion tanks rather than adding water to cool it before it is discharged to the sewer. Ensure all water discharged to the sewer meets allowable water quality standards.	6.5		
LABORATORY AND MEDICAL			
109. **Water purification:** Only purify water when necessary. Treat water to a quality that matches the process requirements.	7.2		
110. Program water purification regeneration based on the incoming water hardness and/or flow through the system. Monitor and adjust settings periodically.	7.2		
111. **Vacuum pumps:** Turn off vacuum pumps when not in use and program them to only discharge the amount of water necessary to remove impurities and cool the unit.	7.3		
112. Periodically check the vacuum pump's operational control schemes, if available, to ensure optimum efficiency (e.g., timers, float-operated switches, total dissolved solids controllers that initiate discharge and make-up water).	7.3		
113. **Steam sterilizers:** Adjust the tempering water needle valve flow rates to the minimum manufacturer recommendations. Periodically review and readjust. Change needle valves annually.	7.4		
114. Install thermostatically actuated valves to control the flow of cooling water for steam sterilizer condensate discharge. Check valves regularly for broken or degraded parts. Turn off steam sterilizers when not in use.	7.4		
115. **Glassware washers:** Operate the glassware washer near or at the minimum flow rate recommended by the manufacturer. Select the fewest number of rinses required for glassware cleanliness.	7.5		
116. **Fume hoods:** Ensure that water flow rates in fume hoods do not exceed manufacturer specifications and recirculating systems do not blowdown or overflow unnecessarily.	7.6		
117. In recirculating systems, make sure the liquid level controller and water supply valve are functioning properly to avoid excess water overflow from the recirculation sump. Calibrate the blowdown process so that it is sufficient to remove entrained contaminants, without being overly excessive. In general, prevent constant overflows or continuous blowdown wastewater.	7.6		
118. **Cage, rack, and bottle washers:** Inspect and repair worn cage-and-rack washer valves and rinse nozzles. Operate near or at the minimum flow rate recommended by the manufacturer with the fewest number of rinse cycles necessary to effectively clean equipment.	7.7		

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119. Run glassware and cage-and-rack washers only when full.	7.5, 7.7		
120. **Film processors:** Ensure that water flows in film processors at the minimum acceptable rate specified by the manufacturer and is turned off when the unit is not in use.	7.8		
121. Check solenoid valves regularly to ensure flow is stopped when equipment is in standby mode.	7.8		