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**RESTAURANT  
MANAGERS  
GUIDE TO  
WATER  
EFFICIENCY**



# RESTAURANT MANAGERS GUIDE TO WATER EFFICIENCY

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Approximately 15 percent of the total water use in commercial and institutional facilities in the U.S. takes place in hospitality and food service establishments.”

-US EPA,  
WaterSense



## Getting Started

The New York City Department of Environmental Protection created this Restaurant Manager’s Guide to Water Efficiency to help restaurants and commercial kitchens in New York City realize long-term and immediate water savings. The guide offers helpful tips on how to increase your facility’s water efficiency and maintain those savings. For ease of use, the manual is organized into four following topics:

1. Understanding your facility’s water usage
2. Reducing water losses from leaks
3. Increasing water efficiency
4. Educating and encouraging water-saving behaviors

## Understanding Your Facility's Water Usage

The old saying, “you can’t manage what you can’t measure” sums up how important it is to address the two following questions:

- How much water is being used in your facility?
- Where exactly is the water being used?

The answers to both these questions can be addressed by conducting a thorough evaluation of water use in the property, through a facility assessment. Facility assessments can be done in-house, with the assistance of free publicly available tools like the US EPA WaterSense® WaterUSE™ Tool, or through a hired contractor. Key information collected during an assessment includes:

- Utility bills and rates (ideally 12 to 24 months’ worth).
- A comprehensive list of equipment in the facility that use water and the associated water flows.
- A comprehensive list of fixtures in the facility that use water and the associated water flows.
- The condition of pipes and identification of visible leaks.

### Meter Data from My DEP

If your restaurant is a stand-alone building, it will most likely have a water meter and an Automated Meter Reading (AMR) device. The AMR system consists of small, low-power radio transmitters connected to individual water meters that send daily readings to a computerized billing system. The property owner can go to [www.nyc.gov/dep](http://www.nyc.gov/dep) and register for a My DEP account to begin viewing water consumption.

## Metering and Sub-metering In New York City

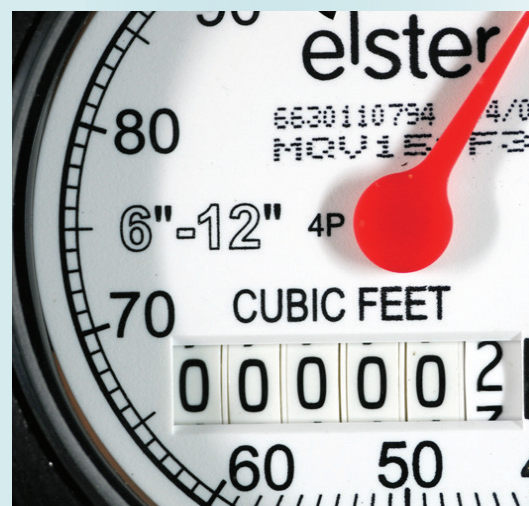
### Important Definitions

#### 1. DEP Water Meter

A device that is used by the Department of Environmental Protection to measure and bill for water supplied from a public water main to a building.

#### 2. Private Water Sub-meter

A device, other than a water meter, installed on a water distribution pipe that measures the flow of water within a specified space or water process. Sub-metering of commercial cooking facilities is required for new restaurants, or those undergoing renovations, per Section 606.7 of the NYC Plumbing Code. Sub-meters are permitted by Department of Buildings and installed at cost to the building’s owner. The Department of Environmental Protection does not read or bill sub-meters.





## Reducing Water Losses from Leaks

A fundamental part of reducing water consumption is eliminating leaks in plumbing systems, fixtures, and water using appliances. Leaks identified during the facility assessment can be repaired immediately. It is important that commercial kitchens check for leaks regularly. Even leaks the size of a pinhole can waste thousands of gallons of water, and cost thousands of dollars per month.

### Leak Detection Checklist:

#### ✓ Check your meter to detect leaks

- Turn off all water fixtures both inside and outside the restaurant; including any flow through appliances
- Read and record your water meter, wait a minimum of two hours, and then read the meter again
  - If your water meter reading has fluctuated slightly, a result of changing water pressure, you probably do not have a leak
  - If the meter reading moved forward continually, even at a slow rate, you have a leak

#### ✓ Check around appliances that use water

- Visually inspect for wet spots or dripping piping around the entire appliance and its connection point

#### ✓ Check all tank toilets

- Place a few drops of food coloring into the tank of your toilet
- Let the food coloring sit for 10-15 minutes until it is completely dissolved. Do not flush the toilet during this time
- Once the food coloring has completely dissolved, check to see if your toilet has a leak
  - If the water in your toilet bowl is clear, you do not have a leak
  - If the water in your toilet bowl shows color from the food coloring, you have a leak. Note that the quicker the dye appears in the bowl the bigger the leak.

#### ✓ Check all sinks and faucets

- Visually inspect all faucets for
  - Drips
  - Ensure aerators are present and clear of scale build up at least once a year
- Visually inspect spray valves for leaks and scale build up
- Visually inspect plumbing under sinks

#### ✓ Check any outdoor water lines

- Visually inspect for wet spots on pavement

### Large leak can mean a loss of upwards of 4,000 gallons a day

High water bills are usually caused by toilets with leaking flappers and faulty fill valves that stay open. Even if you have a small leak, it is worth the effort to make necessary repairs. A fully open fill valve leak can cost you up to

**\$53 each day\*!**

\*Based on fiscal year 2016 rates.





## Increasing Water Efficiency

The assessment of your property will identify specific targets unique to each operation, but there are some common features among restaurants and commercial kitchens.



### Kitchen Equipment

Water use associated with a restaurant can often be reduced by replacing inefficient fixtures and appliances and changing operational procedures. The assessment of your property will identify specific targets unique to each operation, including these common features:

Equipment	Water Use Facts	Recommendation
<b>Combination Ovens</b>	Steam and combination modes require generation of steam, an energy and water intensive process, which can use 30 to 40 gallons of water per hour.	<b>Replace.</b> Switch to a connectionless combination oven which uses 15 gallons of water per hour or less.
<b>Dishwashers</b>	Dishwashers are often one of the largest water and energy consumers in a commercial kitchen. There are many types and sizes of commercial dishwashers and the assessment will help determine if an upgrade is necessary and cost-effective.	<b>Replace.</b> Dishwashers have a life expectancy of 20 to 25 years. Consider replacing old dishwashers with Energy Star Certified dishwashers that can save up to 40% on water related costs and an additional 40% on energy related costs.
<b>Dipper Wells</b>	Dipper wells typically have flow rates between 0.5 and 1 gallon per minute.	<b>Retrofit.</b> Install an in-line flow restrictor and reduce that flow rate being mindful to maintain an adequate velocity and volume of water to remove food residue during intervals between intermittent uses.
<b>Faucets</b>	There are no federal regulations limiting the flow rate of faucets on service sinks. Generally, new faucets are equipped with 2.2 gallons per minute aerators.	<p><b>Retrofit.</b> Install aerators or laminar flow device to achieve 1.5 gallons per minute or less or install foot-operated valves.</p> <p><b>Replace.</b> Select a fixture with a flowrate of 0.5 gallons per minute.</p>
<b>Water-Cooled Ice Machines</b>	Water cooled ice machines with single-pass cooling use between 100 and 300 gallons of water per 100 pounds of ice produced. New installations of water-cooled ice making machines producing more than 500 pound of ice per day is prohibited by Section 428.1 of the NYC Plumbing Code	<p><b>Retrofit.</b> Modify your single-pass water-cooled ice machine to a closed loop recirculation machine.</p> <p><b>Replace.</b> Switch to an air-cooled ice machine which can consume less than 50 gallons of water per 100 pounds of ice produced.</p>

Equipment	Water Use Facts	Recommendation
<b>Pre-rinse Spray Valves</b>	Pre-rinsing dishware with an inefficient spray valve may be using anywhere from 2 to 5 gallons per minute.	<b>Replace.</b> With a EPA WaterSense® labeled model which uses 1.28 gallons of water per minute or less.
<b>Steam Cookers</b>	Food steamers utilize a central boiler and often consume as much as 40 gallons of water per hour.	<b>Replace.</b> Energy Star qualified connectionless steam cookers typically use 3 gallons of water per hour, about 90 percent less water when compared to standard steam cooker models.
<b>Boiler-Based Steam Kettles</b>	Utilizes a central boiler which must be flushed regularly to remove condensate from the supply lines. Flushing the boiler and supply lines can consume more than 100,000 gallons of water per year.	<b>Retrofit.</b> Retrofitting your boiler-based steam kettles with condensate return systems can save both water and energy.  <b>Replace.</b> For smaller needs replace with a self-contained steam kettle.
<b>Wash Down Sprayers</b>	Typically sprayers operate at a flow rate of 7 gallons per minute, but heavy-duty hoses can range from 9 to 20 gallons per minute.	<b>Replace.</b> Install a self-closing nozzle on heavy-duty hoses.  <b>Replace.</b> Switch to a more water efficient sprayers and consider mopping or sweeping for some applications.
<b>Wok Stoves</b>	Wok cooking and cleaning activities can use 500 to 800 gallons of water per day.	<b>Retrofit.</b> Modify your wok to a recirculating model or add a knee operator to your wok stove.  <b>Replace.</b> Switch to a waterless wok stove.

## Domestic Water Usage

Outside of the kitchen, domestic water usage from restrooms and laundry facilities is the largest consumer of water. Updating restroom fixtures can promote water efficiency. Additionally, staff can develop a process for sanitizing and cleaning restrooms that avoids wasting water such as leaving faucets running and excessive toilet flushing.



Equipment	Water Use Impact	Recommendation
<b>Toilets</b>	Older toilets typically use 3.5 to 5.0 gallons per flush.	<b>Replace.</b> With a high-efficiency WaterSense® labeled model which uses 1.28 gallons per flush or less.
<b>Urinals</b>	Pre-1994 flush urinals use between 1.5 and 3.5 gallons per flush, while post-1994 flush urinals use 1.0 gallons per flush.	<b>Replace.</b> With a high-efficiency WaterSense® labeled model which uses 0.5 gallons per flush or less.

Equipment	Water Use Impact	Recommendation
Faucets	Faucets typically come equipped with 2.2 gallons per minute aerators.	<p><b>Retrofit.</b> Install aerators or laminar flow devices that achieve 0.5 gallons per minute.</p> <p><b>Replace.</b> Select a fixture with a flow rate of 0.5 gallons per minute.</p>

## Outdoors

Restaurants with outdoor space should look closely at their current cleaning and irrigation practices. If hardscapes are being hosed, consider using dry cleaning practices when possible or equipping hoses with self-closing nozzles. When considering outdoor plantings, choose plants and soils that require minimal irrigation, such as native plants.



Equipment	Water Use Impact	Recommendation
Hardscape	Heavy duty hoses used to wash down hard surfaces such as sidewalks, and patios can use anywhere from 9 to 20 gallons per minute.	<p><b>Retrofit.</b> Install a self-closing nozzle on heavy-duty hoses.</p> <p><b>Replace.</b> Switch to a water broom which has a 1 gallon per minute flow rate or switch to dry cleaning practices when possible.</p>
Irrigation	The amount of water used varies greatly depending on the facility.	<p><b>Retrofit.</b> Equip existing automatic irrigation system with water saving devices (controllers, soil moisture sensors, rainfall shutoff devices, rain sensors, sprinkler heads, micro-irrigation) or utilize captured rainwater where applicable.</p> <p><b>Replace.</b> Plant a water-smart landscape that uses plants and soils that require minimal irrigation.</p>

## Educating and Encouraging Water-Saving Behaviors

Engaging your staff will often lead to strategies that improve water savings. Help cultivate a team-based approach to generate water-saving ideas by:

- Keeping staff informed of water savings efforts through staff meetings, signs or other communications.
  - Share specific goals whenever possible.
- Ask staff to share ideas and take leadership so they feel invested and responsible for reaching efficiency goals.



US EPA WaterSense® makes it easy to find and select water efficient products and ensures consumer confidence in those products with a label backed by independent certification. Certifying organizations help maintain the WaterSense® integrity and credibility by verifying and testing products for: conformance to WaterSense® specifications, efficiency, performance, label use and periodic market surveillance.

- Post monthly water usage figures in a public area so staff can be informed about the facility's progress.
- Create and place signs identifying water-saving best practices next to water using appliances and fixtures.
- Provide incentives for employees to report leaks or malfunctioning equipment.
- Designate a water conservation point person and assign them specific responsibilities.

## Savings by Design

Renovations are an excellent opportunity to increase the water efficiency of your space. Innovative water use strategies include water reuse and rain-water collection. And a kitchen's hot water heating system is key to maximizing energy and water use efficiency in your operation. **Thousands of dollars' worth of savings can be attained with proper planning during the design and renovation stages of your operation.**





## Additional Tips for Water Efficient Cooking

### Combination Ovens

- Turn the oven down during slow times
- Use the steam mode and combi-mode sparingly
- Shut the oven door to keep water consumption low

### Dishwashers

- Run only with a full load
- Minimize the rinse cycles as much as possible without reducing quality
- Use the correct amount of soap to load size so extra rinsing is not required
- Turn off after service

### Dipper Wells

- Turn off your dipper well once service is over
- Keep the flow rate of the dipper well at its minimum

### Faucets

- Turn the tap off when not in use

### Ice Machines

- Close the ice machine lid to keep cool air in and water consumption low

### Pre-rinse Spray Valves

- Manually scrape food waste before using the spray valve

### Steam Cookers

- Turn the steam cooker down during slow times
- Minimize how often the doors are opened by cooking in batches
- Keep the doors closed when in operation
- Use a timer to ensure that the steam cooker returns to standby mode after use
- Turn off once service is over

### Boiler-based Steam Kettles

- Turn the steam cooker down during slow times
- Make sure the lid is secure

### Wash-down Sprayers

- Shut-off when not in use
- Do not use to clean dishware

### Wok Stoves

- Turn off the cleaning spout on your wok stove in between rinses
- Shut off the cooling water when the wok stove is not in use

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<http://nyc.gov/dep/conservation/restaurants>