

Hotel Manager's Guide to Water Efficiency





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Overview and Getting Started

Hotels account for approximately 12 million gallons of New York City's total water use each day. You can help reduce this amount and save money by lowering your property's water consumption. First, this guide outlines steps to get you started. Second, it highlights common hotel water uses that can often be turned into water savings opportunities, such as housekeeping, laundry, food service, grounds maintenance, or landscape. Finally, it includes a list of tips for hotel staff on the last page.





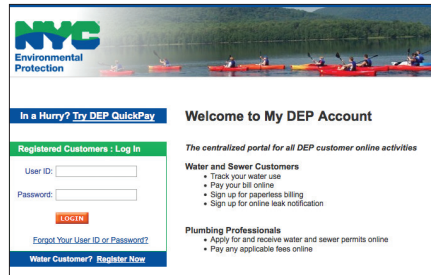
Getting Started

Measure Your Water Use

The old saying, “you can’t manage what you can’t measure” holds true with water use in hotels. It is important to understand how much water your hotel is consuming and how it is divided among the various uses such as in the guest rooms and common areas. A great place to start is with a thorough evaluation of water use in the property, also called an audit or site survey. This can be done in-house or contracted out to a third party specialist. An audit includes collecting historic water bills and counting all the water using fixtures and appliances inside and outside of the building. Observing how water is used in various operations such as cleaning guest rooms, laundry, and food service is also very useful. The evaluation should identify the associated water flows and estimated energy consumption related to hot water use. Additional data such as occupancy rates are useful during this assessment. A detailed water use profile will enable precise planning and implementation of improvements.



It may also prove valuable to benchmark water use against similar hotel operations. A helpful resource for this is the U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager DataTrends series. In fact, NYC Local Law 84 requires buildings 50,000 square feet or more to benchmark annual water and energy consumption using the ENERGY STAR® Portfolio Manager.



Identify, Evaluate, and Select Efficiency Measures

An audit of your property will reveal opportunities for reducing water use and provide the foundation for developing a strategy. It is important to evaluate and rank the various options in terms of cost-effectiveness and qualitative factors such as the impact on the guest experience. Ideally, the selected measures will have a good return on investment and have a neutral or positive impact on the guest experience.

Plan, Implement, and Monitor

Creating a plan that details the hotel water use profile and identifies the targeted areas for efficiency improvements in those uses along with expected costs and benefits will help guide implementation. After the selected efficiency measures are put into action, it is important to monitor changes in water use. All hotels in NYC are equipped with water meters and Automated Meter Reading (AMR) devices that track usage daily and in some cases hourly. Tracking water use data generated by your AMR device is as easy as setting up and logging into My DEP Account at nyc.gov/dep. Frequent monitoring can be done in a matter of minutes and will help identify leaks and other abnormal spikes in water use.

- » Determine your total usage in My DEP Account and create a baseline
- » Conduct an audit of your property to measure water consumption and generate a water use profile
- » Identify, evaluate, and select efficiency measures
- » Plan and implement efficiency measures
- » Track implementation progress and changes in water consumption
- » Monitor water use frequently via MY DEP Account



Guest Rooms

Total water consumption varies from hotel to hotel, but guest rooms often represent the highest water use. This is typically associated with toilets, showers, bathtubs, and lavatory faucets. Some hotels may include a kitchen in the room which will have additional water use. If the fixtures in the guest rooms are old and inefficient, they should be replaced with EPA WaterSense® labeled products. This will ensure water savings and satisfactory performance.

Some hotels may use flushometer valve toilets in guest rooms. If so, 1.28 gallon per flush models are available and recommended. EPA WaterSense® currently only labels tank-type toilets, but is pursuing a labeling program for flushometer toilets.

Offering linen and towel reuse options to hotel guests will help lower water consumption at a very low cost and may appeal to environmentally conscious guests. It is important to provide adequate space for guests to hang towels so they can completely dry between uses.

The process employees use to clean guest rooms also has a large impact on water consumption. Linen and towel reuse programs are only effective if housekeeping staff adhere to the guest requests. Water waste may occur if staff flush toilets repeatedly

and leave showers and faucets running longer than necessary during cleaning. Standardizing a housekeeping cleaning process and educating staff in practices that promote wise water use will encourage day to day water efficiency. Beyond reducing the number of toilet flushes and excessive faucet use this may include changing carpet cleaning methods from a steam or other wet method to a dry powder method, changing the window cleaning schedule from periodic to an on-call/as required basis, and using sustainably-produced or green cleaning products. Additional housekeeping and cleaning tips for hotel staff can be found at the end of this guide.



- » Evaluate guest rooms in audit of your property
- » Replace inefficient toilets, showerheads, faucets, and faucet aerators with EPA WaterSense® labeled products
- » Offer guests the option to reuse linens and towels and make signs visible and easy to understand
- » Check for and fix any leaks and malfunctioning fixtures
- » Develop a standardized housekeeping process to promote efficiency when cleaning guest rooms
- » Change window cleaning schedule from periodic to an on-call/as required basis
- » Switch from wet or steam carpet cleaning methods to dry powder methods
- » Purchase sustainably-produced or green cleaning products for use within the hotel

TIP: EPA WaterSense® labeled tank toilets have a flush volume of 1.28 gallons or less, EPA WaterSense® labeled showerheads have a flow rate of 2.0 gallons per minute or less, and EPA WaterSense® labeled faucets and aerators have a flow rate of 1.5 gallons per minute or less.



Water efficiency efforts should not stop at the guestroom. There are many other water uses throughout the hotel that can be measured, managed, and reduced. There may also be opportunities to reuse water and capture rainwater for purposes such as irrigation.



Overall Building and Common Areas

Ice Machines

Ice machines are commonplace in the hospitality industry. In fact, hotels account for over 20 percent of all commercial ice machine purchases in the United States. While the end product of an ice machine is frozen, a large amount of heat is generated in the ice making process. This heat is cooled via a water or air chilling system. Water cooled units may consume substantially more water than is needed to make the ice. The biggest offender in terms of water inefficiency is a water cooled ice machine with a once through cooling system. Air cooled units are typically more water efficient than water cooled machines. However, not all air cooled units are energy efficient. ENERGY STAR® has labeled air cooled ice makers that save water and energy compared to conventional models. The Consortium for Energy Efficiency also maintains a list of water and energy efficient ice makers. These references can be very useful in selecting an efficient machine to replace inefficient units.



In addition to replacing inefficient ice makers, it may also be possible to reduce the number of machines in the building. And don't forget to check ice machines for leaks.

- » Evaluate the water and energy consumption of ice machines installed during the water audit of your property
- » Replace inefficient ice machines with water and energy efficient units
- » Consider reducing the number of ice machines in the building if feasible
- » Check ice makers for leaks and make any necessary repairs

Laundry

Although many New York City hotels contract their laundry out, there are some large hotels that have laundry facilities in-house. Whether laundry is done in-house or contracted out to a third party, there is opportunity to reduce the associated water consumption. Offering towel and linen reuse programs to hotel guests as described in the Guest Room section, is a great place to start.

When guests participate in a towel and linen reuse program, water is saved with very little cost or effort



on the part of the hotel. It is important to make signs communicating the program easy to find and easy to understand. In addition to clear instructions on how to participate, a message about the value of water and the need to conserve will help stimulate participation.

In-house laundry equipment can be evaluated to ensure it is mechanically efficient and being operated in a way that prevents excessive water use. Making sure the machines run with full loads and at proper water levels is fundamental. Commercial laundering equipment varies based on the facility's requirements and should be a focal point of your property audit. There may be opportunities for water reuse in the system as well as the installation of an ozone system. Sub-metering water consumption in laundry

facilities will also help monitor for high levels of use. As of January 1, 2011 the New York City Plumbing Code requires water distribution pipe lines serving a commercial laundry facility to be equipped with a sub-meter.

If laundry is outsourced, management can contract with a service provider that uses efficient practices, or speak to their current provider about making efficiency improvements.

- » Offer guests the option to reuse linens and towels using eye catching signage with easy to follow instructions
- » Evaluate in-house laundry equipment for possible replacement or retrofit as part of your property audit
- » Ensure laundry equipment is being operated efficiently
- » Run the washing machine only with a full load
 - Minimize rinse cycles as much as possible without reducing quality
 - Use the correct amount of soap to load size so extra rinsing is not required
- » Install a sub-meter to monitor water use in the laundry facility if one is not installed already
- » Seek laundry service providers that use efficient practices, if outsourced

TIP: Each set of towels and bed sheets take approximately 6 to 8 gallons of water to launder.

Pool and Spa

Pools and hot tubs require large amounts of water for operation and may be a source of great water savings. Proper maintenance can reduce water lost to evaporation and leaks, and reduce the frequency the water has to be replaced. Leaks are often found in the various plumbing connections, at separations along the pool top, and in the liner, sidewalls, and floor of the pool itself.



Manually washing filters instead of backwashing can save water and result in a more thorough cleaning. Using pool covers and controlling the water temperature can help reduce water lost to evaporation. Because there is a possibility for large amounts of water to be lost to leaks and evaporation, it may be worth the investment to install a sub-meter to the pool makeup line. This will allow the operator to monitor water use and identify leaks. As of January 1, 2011 the New York City Plumbing Code requires newly installed swimming pools to be equipped with a makeup line sub-meter.

- » Inspect pool and spa for leaks on a routine basis and make needed repairs
- » Clean filters manually instead of backwashing if feasible
- » Maintain a proper chemical balance to avoid the need to drain the pool
- » Maintain a lower pool temperature to reduce evaporation, particularly when not in use
- » Use a pool cover to prevent evaporation if practical
- » Plug the overflow line when the pool is in use
- » Install a sub-meter on the pool makeup line if one is not installed already

TIP: A small leak the size of a pinhole can lose 30,000 gallons of water in one month.

Common Area Restrooms

Like the bathroom found in guest rooms, common area restrooms can be updated to promote water efficiency. While the prescription is generally the same, men's common area restrooms also contain urinals. These fixtures often have potential for efficiency improvements and EPA WaterSense® has labeled urinals that are water efficient (0.5 gallons per flush) and perform well.



The toilets found in common area bathrooms may use flushometer valves. EPA WaterSense® currently only labels tank-type toilets, but is pursuing a labeling program for flushometer toilets.

Staff can develop a process for sanitizing and cleaning common area restrooms that avoids wasting water such as leaving faucets running and excessive toilet flushing.

- » Evaluate common area restrooms in the water audit of your property
- » Replace inefficient toilets, urinals, showerheads, faucets, and faucet aerators with EPA WaterSense® labeled products
- » Check for leaks and malfunctioning fixtures on a regular basis and make needed repairs
- » Develop a cleaning and sanitation process that avoids excessive water use

Food Service

Water use associated with a hotel restaurant, bar, banquet service, and room service can often be reduced through the replacement of inefficient fixtures and appliances and by changes in behavior or operations. The audit of your property will identify specific targets unique to each operation, but there are some common features.



Food cooking is often done with food steamers that use a central boiler. These steamers often consume large amounts of water and it may be cost-effective to replace them with a more efficient connectionless steamer or combination oven.



Dish cleaning offers opportunities for saving water as well. Before plates and dishes are loaded into the dishwasher they are often cleaned with a pre-rinse spray valve. Replacing an old pre-rinse spray valve, (which may use 2 to 5 gallons per minute) with an EPA WaterSense® labeled model using 1.28 gallons of water per minute will yield significant savings at a low cost.

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 audit will help determine if an upgrade is necessary and cost-effective. Dishwashers have a life expectancy of 20 to 25 years, indicating there are likely many inefficient units installed that can be replaced with newer and more efficient technology.



Improving the efficiency of pre-rinse spray valves and dishwashers will save hot water, which in turn will lower the facility's energy use.

In addition to being found in hotel common areas, ice machines are present in areas where food and drinks are being prepared and served. These should be evaluated and upgraded if feasible.

Kitchen operations can also be examined to identify any possible water waste that can be mitigated. For example, faucets are sometimes left running continuously. Modifying any water wasting behavior will provide a benefit at a very low or even zero cost. Sub-metering water consumption in food service facilities will also help monitor for high levels of use. As of January 1, 2011 the New York City Plumbing Code requires water distribution pipe lines serving a commercial kitchen facility to be equipped with a sub-meter.

- » Evaluate kitchen equipment, as part of the property audit, for potential replacement
 - Food steamers
 - Dishwashers
 - Pre-rinse spray valves
 - Ice machines
- » Check for leaks and malfunctioning equipment on a regular basis and make needed repairs
 - Modify any water wasting behavior such as letting faucets run continuously
 - Install a sub-meter to monitor water use in the food service facility if one is not installed already

Floor Cleaning

Hotel operations require cleaning of hard surfaces such as sidewalks, patios, pool decks, walkways, and kitchen floors. The cleaning process often includes the use of a hose. It is important to use water as efficiently as possible when cleaning hardscapes. This can be done by using dry cleaning practices when possible and equipping hoses with self-closing nozzles.

- » Use dry cleaning methods when possible
- » Use a self-closing nozzle if a hose is needed for floor cleaning
- » Consider the use of an efficient waterbroom if wet cleaning is required

TIP: Waterbrooms provide an alternative that allows a wet cleaning method at a lower flow rate (1 gallon per minute) compared to standard hose and nozzle which typically flow at 5 gallons per minute.

Leaks

Improvements in water efficiency often focus on water fixture and appliance upgrades and changes in water using behavior. A fundamental part of reducing water consumption is eliminating leaks in plumbing systems, in the various water using fixtures and appliances, and in pools and spas. A water audit of your property will identify leaks that can be repaired, however, it is important to stay vigilant to identify and repair new leaks as they occur. Even leaks the size of a pinhole can waste thousands of gallons per month. Leaks can be hard to find, so take advantage of your Automated Meter Reading device and DEP's free Leak Notification Program by setting up a MY DEP account online. It is easy and can help save a lot of water and money.



- » Fix leaks identified during the property audit
- » Continue to regularly check for and fix leaks
- » Set up a Leak Notification alert at My DEP account

Irrigation

Some hotels have outdoor space requiring irrigation. If this is the case, incorporating efficient irrigation practices can yield large water savings. Simple operational modifications, such as not watering plants during the heat of the day, can help reduce the amount of water used to irrigate. Planting a water-smart landscape with native plants that require little irrigation and using soils that hold moisture are other strategies to improve water use



efficiency. If there is an automatic irrigation system in place it should be equipped with water savings devices and of course checked for leaks. Rain sensors, soil moisture sensors, and weather based irrigation controllers utilizing evapotranspiration information can be installed to prevent the irrigation system from operating when it is not needed. There may also be opportunities for rainwater capture and other types of on-site water reuse that can be used for irrigation.

- » Avoid watering plants and turf during the heat of the day
- » Select native plants that require little or no watering
- » Select soil that retains moisture and reduces watering requirements
- » Equip irrigation systems with controllers that prevent watering when it is not needed
- » Irrigate with harvested rainwater and other water captured on-site



Cooling Towers

Cooling towers are often used in hotels to cool the building via the HVAC system and can be a leading source of water use. Proper maintenance and retrofits such as conductivity controllers and pH controllers can greatly reduce the water use of a cooling tower. Any cooling towers should be closely inspected during an audit. It may be cost-effective to meter cooling towers in buildings with large cooling requirements; cooling towers may represent a large portion of your property's water consumption. As of January 1, 2011 the New York City Plumbing Code requires newly installed cooling towers to be equipped with a makeup line sub-meter. Properties must have a dedicated meter for cooling tower make-up lines in order to qualify for a wastewater allowance through NYC DEP. A wastewater allowance prevents a property from being charged for water that does not get discharged into the sewer.

- » Maintain and retrofit cooling towers to promote efficiency
- » Install a sub-meter to monitor cooling tower water use if one is not installed already

TIP: As of January 1, 2011 the NYC Plumbing Code requires cooling tower and swimming pool makeup lines to be equipped with a sub-meter. The Plumbing Code also requires sub-meters for commercial cooking facilities, commercial laundry facilities, and commercial gyms or spas.

Rainwater Harvesting and Water Reuse

Each property is unique, but some hotels will have large roofs that can be used to collect rainwater, and additional impervious surfaces such as parking lots that can be used to gather stormwater. There may be other opportunities to capture water on-site from things like air-conditioner condensate, steam condensate, cooling tower blow down, swimming-pool backwash, and reverse osmosis reject water. Graywater and blackwater systems may also be viable options for on-site water reuse. Harvested rainwater and other water captured on-site can be used to irrigate turf and other plants, supply cooling towers with water, and flush toilets and urinals.



Con Edison steam customers can also use condensate to preheat domestic hot water through a heat exchanger. This reduces water consumption in two ways: (1) it offsets total steam consumption, and (2) reduces the amount of water used to cool the condensate before it is released into the sewer.

- » Evaluate the property for the potential to harvest rainwater and stormwater
- » Inspect equipment such as air-conditioners, steam systems, cooling towers, pools, and reverse osmosis systems for possible capture of water that can be reused
- » Evaluate the potential for graywater and blackwater systems
- » Identify possible uses for recycled water and water captured on-site such as irrigation, cooling tower make-up, and toilet and urinal flushing
- » Treat recycled and captured water to meet the quality standards of its intended use
- » Preheat domestic hot water with steam condensate if feasible

These potential options can be evaluated during the water audit of your property. It is important to know what is allowed by the NYC Plumbing Code and treat water to meet the quality standards of its intended use. Agencies that may have jurisdiction include, but are not limited to, the New York City Department of Buildings, the New York City Department of Health, the New York City Department of Environmental Protection, and the New York State Department of Environmental Conservation.



Educate and Engage Staff

Strategies to improve water savings will require staff participation to be successful. For example, if staff does not adhere to the hotel linen reuse program, no water will be saved. The same would be true if a housekeeping protocol were developed to use less water for guest room cleaning. Keeping staff informed of water savings efforts, asking them to share ideas and take leadership, and ensuring staff feel invested in and responsible for reaching efficiency goals will help maximize the impact of efforts.



Guest Awareness

Increasing guest awareness of water efficiency efforts and the importance of using water wisely will help increase participation in hotel linen reuse programs and prevent wasteful practices like taking long showers and letting the faucet run when it is not in direct use. Simple steps such as making linen reuse placards and signs easy to find with clear instructions can have a large impact.

Tips for Water-Efficient Housekeeping

GUEST ROOM

- » Adhere to hotel reuse linen/towel program to reduce laundry.
- » Make sure linen/towel changing cards and other water conservation cards are in place for guests to find and easily read.
- » Minimize water use during the room cleaning wherever possible.
- » Turn off the tap during cleaning if not being used for cleaning purposes.
- » Flush the toilet only when necessary during cleaning.
- » Report leaking faucets and showerheads to maintenance immediately.
- » Report running toilets and toilets that flush poorly or have other issues.
- » Use a bucket to catch excess water from a running shower or sink and reuse for other purposes, such as mopping the floor or watering plants.
- » Do not use running water to melt ice in sinks.
- » Save opened bottles of water to water plants.
- » Do not replace unopened bottles of water in the rooms.
- » Ensure thermostat is set as instructed by management to save energy and water.

LAUNDRY ROOM

- » Run the washing machine only with a full load.
- » Minimize the rinse cycle as much as possible without reducing quality.
- » Use the correct amount of soap to load size so extra rinsing is not required.

OUTDOOR

- » Do not use hoses to wash walkways. Use a broom to brush debris away instead.
- » Water during the morning or evening instead of middle of the day.
- » Report broken or leaking irrigation equipment, such as hoses and sprinkler heads.

POOL AND SPA

- » Inspect pool and spa for leaks on a routine basis and make needed repairs.
- » Clean filters manually instead of backwashing if feasible.
- » Maintain a proper chemical balance to avoid the need to drain the pool.
- » Maintain a lower pool temperature to reduce evaporation, particularly when not in use.
- » Use a pool cover to prevent evaporation if practical.
- » Plug the overflow line when the pool is in use.

For more information, scan the code below or visit
<http://nyc.gov/dep/conservation/hotels>



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