



## Water Conservation for Hotels

### Benefits from implementing water conservation measures:

1. Save money – reduced utility costs, and reduced costs of heating, pumping & maintenance
2. Protect the environment - reduce strain on local water resources & infrastructure
3. Improve guest comfort - reduce likelihood of water shortages, equipment failures, and fluctuations in water pressure & temperature

### Step 1

- Evaluate hotel's water use patterns (daily and monthly) to identify times/places of high water use, and identify ways to conserve
- Common high-water-use areas to check: Guest room plumbing, Grounds and irrigation, Laundry, Pools and Jacuzzis, Kitchen, Bars and Ice Machines.

### Step 2

- Set priorities and take action
- Good solutions to consider: Aerators, low-flush/water dams, watering strategies, maintenance, leaks, reusing greywater

### Step 3

- Continue to monitor consumption
- Identify problems quickly, track progress

### Short Term Practices

- Install faucet aerators
- Install water-efficient showerheads
- Reduce pressure carried by the property's water distribution system
- Install foot pedal valves in kitchen sinks

### Long Term Practices

- Harvest rainwater to use for laundry, etc.
- Irrigate lawns with graywater (from sinks, showers, laundry, etc.)
- Install low-flush toilets over time

**Example:** An assessment of a 30-room hotel revealed 67% of its guestroom faucet aerators were faulty and leaked at flows of up to 5.5 US gallons/minute. Installing 1.5 US gal/min aerators could have reduced water consumption by more than 225,000 US gal/year and saved 2,400 US \$/year. This measure required a US \$200 investment and offered a payback period of 5 weeks.



## Wastewater Treatment

### What is “wastewater”?

Wastewater is any water that has been used and is no longer pure. It includes:

1. Greywater – water that has been used in cooking, bathing, laundry
2. Sewage from toilets - containing human waste
3. Irrigation water - containing fertilizers and pesticides
4. Water from swimming pools and hot tubs - often containing harsh chemicals like chlorine and bromine
5. Industrial water from factories, businesses, etc.
6. Water from the environment - surface water, storm water, and groundwater.

Without adequate treatment, wastewater can pollute coastal waters, damage fragile ecosystems like coral reefs, and spread diseases. Toxins such as pesticides and chlorine can stress or kill organisms outright. Excessive nutrients (from raw sewage or agricultural fertilizers) can cause a syndrome called eutrophication - excessive growth of plants (usually algae), with resultant clouding of water, lowered oxygen levels, foul odors, and death of fish. Raw sewage can also carry pathogens that endanger the health and safety of people as well as of wildlife. Coral reefs are particularly susceptible to smothering from excessive seaweed and algae growth caused by improperly treated wastewater.

### Basic Wastewater Treatment:

1. **Preliminary treatment** removes trash and coarse sand and grit. This is commonly accomplished with bar screens and grit chambers. Grease traps are also part of pre-treatment. Kitchen outflow pipes, for example, must have grease traps.
2. **Primary treatment** removes most of the settleable solids, and floating material, including much of the oil and grease. This results in a “sludge” that must be disposed of periodically. Typically, primary treatment removes 50% of the suspended solids and about 30% of the biodegradable components.
3. **Secondary treatment** removes most of the remaining solids and further breaks down the biodegradable components.

Primary and secondary treatment are often combined in a single septic tank with two chambers. Within a septic tank, grease floats to the top, solids settle to the bottom, and anaerobic bacteria slowly process the biodegradable components. Water from the first tank flows to the second tank for further processing. Outflow from the second tank is finally sent out of the septic tank to a leaching field (also called drain field or seepage field), where it is further filtered naturally and taken up by plants. If the system is working well, this outflow should be quite clean, and can be captured and re-used for irrigation – though the water should be tested to be sure it is indeed clean enough for this purpose.

Sources: Caribbean Alliance for Sustainable Tourism (CAST), San Juan, Puerto Rico. URL: [www.caribbeanhotels.org](http://www.caribbeanhotels.org)

**Key Considerations for Wastewater Treatment:**

- Most coastal hotels will need to install their own septic systems.
- Once installed, septic systems should not be forgotten or assumed to run trouble-free. They need regular inspection and maintenance to work properly. Otherwise, treated water emerging from the septic system can become progressively more contaminated as the system becomes clogged with grease and sludge and its cleaning efficiency declines. Septic tanks must be cleaned of sludge periodically (leaving 10% of the sludge to re-populate the bacterial population), and the preliminary treatment components, particularly grease traps, must also be cleaned (see below).
- Grease traps must be cleaned once per week, particularly in kitchens. Otherwise, the grease will ultimately clog the pipes of the septic system. The common practice of dissolving grease with sulfuric acid is not recommended. The grease merely re-hardens downstream (often in the outflow pipe to the leaching field), and the acid kills helpful bacteria. Instead, manually scoop out small grease traps, hire professionals to clean large grease traps, and use bioaugmentation – additional of helpful bacteria that can break down grease.
- Sludge from the septic system or treatment plant must be disposed of carefully; it can be environmentally hazardous. In some cases, properly treated sludge can be used on the grounds as fertilizer.
- Properly treated wastewater can then be re-used for irrigation, but it must be monitored to be sure it truly is clean and will not spread disease.
- Laundry greywater should not be sent through the wastewater treatment process. Hot laundry water restricts growth of helpful bacteria, the surges of large volume can overload the system, and greywater does not require full treatment in any case (since it usually contains only soap and dirt). Laundry water is best sent to a laundry water re-use system, or can be sent to a soakage pit.
- Harsh chemicals like bleaches and chemical cleaners can make wastewater unsuitable for any environmental use. The best course of action is to limit the use of these chemicals in the first place. In most cases, other cleaners can be used.
- Proper training is critical for employees who perform system maintenance (e.g., grease trap cleaning) or treatment plant operation. Wastewater treatment should not be viewed as a menial or unimportant job; it is a complex process with great importance for the environment and the community.



## Solid Waste Management

Solid waste consists of any sort of physical waste that is not dissolved in water – “trash and garbage” along with all sorts of other items such as food scraps, broken furniture, construction debris, old clothing, bottles, cans, papers, etc. Hotels concentrate large numbers of people who generate huge amounts of solid waste. Most tourists generate more solid waste per day than local residents.

### Benefits from effective waste management:

- Reduced utility costs, e.g. hauling and tipping fees (for example, the Half Moon Hotel in Jamaica reduced its garbage hauling costs from US \$1,700 to US \$620/month).
- Increased revenue from recyclables
- Reduced insect and rodent problems, fire hazards, and odors
- Improved community relations,
- Improved sanitation
- Improved aesthetics, e.g. reduced litter on beaches
- Improved guest satisfaction, due to all of the above

### Tips for solid waste reduction:

- Recycle all possible items – glass, aluminum, papers and plastics. Make available containers for separating waste, and encourage development of recycling programs.
- Collect waste in tight-fitting containers to avoid rodent and mosquito problems (see below).
- Certain types of solid waste tend to collect rainwater and can spread mosquito-borne diseases, particularly rubber tires, bottles, cans, etc. In areas where this is a concern (e.g., malaria and dengue fever zones), encourage people to store cans, bottles, etc. upside-down on peg racks, or in a covered location where they will not collect rain.
- Re-use all items when possible – e.g. old furniture or clothing can be re-used on property, or given to staff or charity.
- Provide guests with a place to leave unwanted items that can be donated to charity.
- Unused food may sometimes be suitable for donation to charity.
- Compost all organic garden and kitchen waste (food scraps, etc.) and use for fertilizer for gardens.
- Minimize use of individually packaged guestroom amenities (e.g. bottles, cans) and plastic bags.
- Minimize use of disposable items (e.g. plastic bags, plastic tableware, disposable cups, cook caps and aprons, paper napkins, etc.) and single-serving food packages (butter, sugar, cream, jams, condiments, milk, juices, cereals, etc.).
- Collect and/or recycle used cooking oil.
- Clean grease traps frequently and without harsh chemicals (See Wastewater section).
- Purchase commonly used items in bulk containers when possible.
- Ask chemical suppliers to take back empty chemical containers.
- Use environmentally friendly chemicals and minimize use of hazardous chemicals (e.g. drain cleaners, descaling acid, solvents.)

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## Energy Conservation

Energy, in the form of electricity and fuels, are a substantial part of hotels' operating costs, and commonly add up to 70% of utility costs. The major of this usually is air-conditioning in guest rooms. Energy conservation is a quick way to reduce operating costs with little capital investment. It can also reduce the harmful effects of fossil fuels on air quality, the ozone layer, global warming, and sea levels.

### Best “No-Cost” Energy Savings Measures

- Assign one staff member to spearhead the energy conservation program. Responsibilities should include reading of meters (at least on a monthly basis), and monitoring progress.
- Emphasize staff awareness, training, and checklists or other clear instructions to meet energy conservation targets.
- Adjust settings and illumination levels to ensure minimum energy used for desired comfort levels. Hot water can usually be set to 122°F, and room air temperature to 72-74°F.
- Establish a preventive maintenance schedule for all major equipment, paying particular attention to:
  - Adjusting and replacing belt drives
  - Insulating and repairing pipes and ducts (10-20% is typically lost)
  - Frequent servicing of air-conditioning equipment (usually results in 20% energy savings)
  - Repairing seals on doors, windows, coolers, freezers, etc.
  - Abnormal equipment vibration or sounds
- Assign rooms so that unoccupied areas can be shut down.
- Have staff turn off pool pumps and exhaust fans overnight.
- Run only full loads through dishwashers and washing machines.
- Consider using natural sunlight to totally or partially dry laundry.
- Wherever possible, use natural ventilation, and shading from trees and other vegetation to cool guest rooms, patios, etc.