

# The Most Precious Resource – Water



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According to the Worldwatch Institute, a leading source of information on the interactions among key environmental, social, and economic trends, the world's freshwater ecosystems are rich – but greatly imperiled. At least 20 percent of all freshwater species globally are extinct or at risk; the figure is twice as high in North America. One-sixth of the world's population – 1.1 billion people – lack access to safe drinking water. More than double that number have no access to proper sanitation. Each year, more than 5 million people die from water-related diseases. Without increased conservation efforts, better management of water resources, and related ecosystems, two-thirds of the world's population will suffer from severe or moderate shortages by the year 2025.

Freshwater systems suffered greatly in the 20th century from huge increases in water

withdrawals for human use, extensive pollution, a proliferation of dams, and widespread draining of wetlands. This fact leads us to ask, "Does it make sense to use expensive, multi-chemically treated water to flush human waste?"

Water is the most valuable resource in the world! A person can live more than a month without food, but not more than a week without water. The importance of water in daily functions highlights the fact that we must pay close attention to how we are utilizing this resource.

To meet the challenges of managing water resources, it is imperative that there be a change in the mindset of those responsible for

purchasing materials that are used in higher education institutions and throughout the building industry. The inextricable link between health and the built environment must include the broader understanding of resource use and stewardship, as well as the role that improved technology can play in providing more healthful facilities. This is an operative definition of the biggest challenge to public health in the 21st century.

Wise stewardship of fresh water is not only economical, it is essential to ensure adequate supplies in the future. Annually, approximately 25 percent of the total renewable fresh water supply in the United States is withdrawn for use in buildings, homes, industry, agriculture, and recreation. Approximately 65 percent of this water is returned to our water systems, but the resultant deficit is huge – estimated at 3.7 trillion gallons per year. Our current water-intensive practices and the frightening rapidity

at which our water supply is diminishing mandate an overhaul of our approach to water policy and water usage at every level, including the procurement of plumbing fixtures.

The U.S. Green Building Council has developed the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, a building-certification process that intends to foster more environmentally sound and economically viable decisions in building design and construction, and which is in

COST COMPARISON				
MANUFACTURER	KOHLER STANDARD URINAL	FALCON WATERLESS	AM. STANDARD STANDARD URINAL	WATERLESS CO.
SIZE	18"	18"	18"	18"
MODEL	Stanwell	U2P (ADA)	Lynbrook	Sonora (ADA)
LIST PRICE	\$506.90	\$309.00	\$625.00	\$498.50
WALL SUPPORT	Required	Not required	Required	Not required
FLUSH VALVE	Delaney	None	Sloan 980	None
VALVE TYPE	Handle-activated	None	Handle-activated	None
NEW CONSTRUCTION	Water supply required	Not needed	Water supply required	Not needed
INSTALL. LABOR*	\$124.00	\$30.00	\$124.00	\$30.00
TOTAL FIRST COST	<b>\$752.00</b>	<b>\$339.00</b>	<b>\$772.00</b>	<b>\$528.50</b>
WATER USE/FLUSH	1 gallon/flush	None	1 gallon/flush	None

\*Water-supply related labor and pressure test on flushed urinals only. Assumption: A urinal uses 28,200 gallons of water/sewer per year. Flush valve repair parts and time=Labor is estimated at \$85.00/year for flushed urinals and \$33.50/year for waterless urinals.

## WATER / SEWER RATES

CITY	BASIC MONTHLY WATER/SEWER RATE PER 1,000 GALLONS (2002)	ESTIMATED PARTS/LABOR PER YEAR	TOTALS FLUSH URINAL (BASED ON 28,200 GALLONS/YR.)	ESTIMATED PARTS/ LABOR WATERLESS URINAL	ESTIMATED TOTAL COST SAVINGS/YR.
BOSTON	\$8.58	\$85.00	\$325.24	\$33.50	\$291.74
NEW YORK	\$5.00	\$85.00	\$225.00	\$33.50	\$191.50
ATLANTA	\$7.53	\$85.00	\$295.84	\$33.50	\$262.34
CHICAGO	\$16.51	\$85.00	\$547.28	\$33.50	\$513.78
HOUSTON	\$8.50	\$85.00	\$323.00	\$33.50	\$289.50
LOS ANGELES	\$7.00	\$85.00	\$281.00	\$33.50	\$247.50
SAN DIEGO	\$6.22	\$85.00	\$259.16	\$33.50	\$225.66

The payback period for the Sonora Model in Houston, Texas, is 1.8 years and only 1 year in Chicago. The above-listed costs do not include recurring meter charges and similar surcharges.

wide use. A LEED-certified building is recognized for outstanding energy and resource efficiency, innovative design, and environmental responsibility. Water efficiency is one of the categories the LEED process recognizes as an opportunity to have a tremendous positive impact.

It is believed that a 30 percent reduction in water usage in buildings is very achievable through existing measures. As increasing water demand further taxes our diminishing water supply, prices will most certainly continue to escalate. LEED-certified buildings will not only stand out as examples of resource conservation and efficiency, but they will also be increasingly more economical to operate over time.

Remember how often it is suggested that only through changed minds can behavior be altered. Using precious, potable water to flush human waste is not economical or wise. Here is an example of changed minds. The installation of waterless urinals is a simple, effective means of changing behavior. The result is a more resource-efficient building that is more economical in both first- and life-cycle costs. Assuming reasonable usage, a waterless urinal can save approximately 28,200 gallons of water per year. As a bonus cost-savings, sewer charges in most utility settings are also eliminated or greatly reduced, as they are usually directly linked to water usage. Therefore, waterless urinals save money on two fronts – forever.

By reducing the amount of effluent released into the sewer, we reduce the amount of fluid released into our wastewater treatment plants and into our natural waterways and oceans. This reduction slows down the dollars required for reinvestment and operating costs. The EPA estimates that standard toilets and urinals flush down the drain 4.8 billion gallons of water each day in the United

States. In a typical institutional building, assuming the following – three urinals, 120 men using a urinal three times a day, 1 gallon per flush, and 235 working days per year – then 84,600 gallons of potable water are flushed down the drain every year. Waterless urinals deliver zero water utilization!

We are aware of an institution of higher education that has installed 47 waterless urinals to date at a price of \$398 per unit, with a series of very positive experiences. Waterless urinals are now the standard for urinals and are incorporated into the design for all new facilities. New construction in progress has 15 waterless urinals specified, and two new facilities in planning will add another 24.

In addition to saving water and reducing sewer effluent, waterless urinals are a great improvement over traditional urinals in both maintenance and hygiene. The moisture associated with standard water-flush urinals plays host to microbes, bacteria, and viruses. These pathogens become airborne when the urinals are flushed. By installing waterless urinals, with predominantly dry surfaces and no flushing actions, the exposure to airborne bacteria is reduced tremendously. Due to the absence of water, ammonia oxide generated in the chemical reaction between urine and water is prevented or greatly reduced. This chemical reaction is what causes the odors typically associated with urinals. Yes, waterless urinals make bathrooms smell better! And the hands-free operation of waterless urinals eliminates the biggest source of germs – the flush valve handle! It is *not* a National Park Service experience.

As a testament to how well employees like the waterless urinals, this unsolicited endorsement was recently received by e-mail at the referenced institution:

“Just wanted to commend whoever

made the decision to install waterless urinals in the 7th floor blue section men’s room. The others are always breaking in some way or other (I notice the fancy motion sensors have been replaced with old-fashioned handles in the green section men’s room). I use the blue section every day, despite the longer walk (not that I don’t need the exercise.). Thanks, R.H.”

Housekeeping professionals inform us that installing a waterless urinal minimizes routine maintenance, and mechanical maintenance is reduced to changing the cartridges quarterly. The maintenance costs associated with valve repair, clogged sewer pipes, vandalism, or any other repairs are nonexistent. With proper attention, the maintenance requirements for a waterless urinal are absolutely minimal compared with keeping mechanical flush systems operational and leak-free. These no-flush units are cost-effective. Financial and resource savings over the fixture life cycle make the decision to convert a no-brainer. In fact, the maintenance advantages of waterless urinals have resulted in a policy at this institution to replace the entire urinal assembly with a waterless urinal if an auto flush valve breaks. And if any facility is remodeled, the conventional urinals are replaced with waterless urinals. In order to educate and gain acceptance of the waterless urinals, placards are posted in close proximity, diagramming its functions; articles are displayed explaining the benefits; users are thanked for their contributions.

Replacing standard urinals with waterless urinals does not require a great deal of labor. Simply shut down the existing water supply and cap the line. Mount the waterless system on the wall like other conventional urinals, and then connect it to the drain/sewer pipe using a gasket/flange or standard pipe connection.

Waterless urinals are available in the United States from three companies: Falcon Waterfree Technologies, the Waterless Company, and Duravit. The primary differences among the products lie in the trap design, but all designs involve a simple trap that seals sewer gases and urine with a layer of immiscible liquid that floats on urine.

Because there are areas that already suffer from water shortages, it is imperative that we conserve this natural resource today so that we may avoid severe shortages tomorrow. In her book, *Last Oasis: Facing Water Scarcity*, Sandra Postel postulates that "Water scarcity will affect everything from prospects for peace in the Middle East to global food security, the growth of cities, and the location of industries." To magnify this view, since 1950, the global renewable freshwater supply per person has fallen 58 percent, as world population has swelled from 2.5 billion to 6 billion. By 2015, nearly 3 billion people – 40 percent of the projected world population – are expected to live in countries that find it difficult or impossible to mobilize enough water to satisfy the food, industrial, and domestic needs of their citizens.

In an article entitled "Water for the Future," published in *Texas Parks & Wildlife* [July 2002], Dr. Larry McKinney states that almost 900 Texas cities will not have enough water from current sources to meet their needs in the year 2050. And according to "Water for Texas 2002," a newly adopted state plan, Texas currently has an unmet need of 2.4 million acre-feet of water annually, which is equivalent to approximately 782,043,428,541 gallons. So, does it make sense to use expensive, multi-chemically treated water to flush human waste? The answer is a resounding "NO!"

In the recent past, water has been abundant and inexpensive, leading people to use more than necessary. We must become more conscious of the amount of water we use and look for ways to reduce it. These statistics and predictions can be overwhelming, but you can make a difference. Purchasing decisions are the most powerful form of policy and product expression in a capitalist society. Purchasing for an institution magnifies the power of this decision, and you have regulations to support

you. The 1992 Federal Energy Policy Act mandates more efficient commercial plumbing fixtures. So why not replace the watered urinals with waterless urinals?

Do Great Things!!

For more information on the Worldwatch Institute and LEED, visit The Worldwatch Institute at <http://www.worldwatch.org> and LEED at [http://www.usgbc.org/LEED/LEED\\_main.asp](http://www.usgbc.org/LEED/LEED_main.asp).



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