



# City of Portland Green Purchasing Case Study

## Waterless Urinals

### Purchasing Green

In 2003, Facilities Services replaced conventional urinals in the men's restroom on the 12th floor of the Portland Building with waterless models. The waterless urinals use a replaceable cartridge installed at the bottom of the urinal that acts as a funnel. Urine passes through the cartridge and then through a biodegradable liquid sealant. Because the liquid sealant is lighter than water, it provides an airtight barrier between urine and the restroom, preventing odor from escaping the drain.

### Benefits

According to the U.S. Department of Energy, toilets and urinals can account for nearly one-third of building water consumption. Each waterless urinal saves Facility Services about 40-50 gallons of water per day, totaling 80-100 gallons per day for the two urinals located in the Portland Building's 12th floor men's restroom. Each year, 19.8 million tons of CO<sub>2</sub> is generated from transporting and treating water for urinals. By eliminating water used to flush traditional urinals, waterless models conserve energy and reduce greenhouse gas (GHG) emissions associated with water use.

Waterless urinals may result in cleaner restrooms, providing public health benefits. Because no water is used, breeding grounds for bacteria are reduced. And with no flush mechanism, waterless urinals are hands-free, further reducing the spread of germs.

The liquid sealant in waterless urinals, which traps odor, eliminates the need for urinal deodorizing blocks. Some urinal deodorizing blocks contain paradichlorobenzene or ammonium quaternary compounds, respiratory irritants that can trigger asthma attacks. The liquid sealant in the waterless urinals installed in the Portland Building does not contain hazardous chemicals and is biodegradable.

### Cost

Waterless urinals are less expensive to purchase, install, and maintain than conventional urinals because they have no flush valves, sensors, or mechanical parts. Waterless urinals also reduce sewer costs, 100 percent of the water costs previously used to flush urinals, and energy costs associated with transporting water to and from urinals.

Maintenance is minimal – just cleaning the fixture and changing the cartridge 3-4 times per year. Replacement cartridges cost around \$46. Problems with traditional urinals such as broken flush valves and plumbing problems are reduced or eliminated.



*The waterless urinals installed in the Portland Building save 80-100 gallons of water per day..*

### At a glance –

#### *Who –*

- Facilities Services

#### *Product –*

- Waterless urinals

#### *Cost –*

- Less expensive to purchase and maintain

#### *Benefits –*

- Each urinal saves 40-50 gallons of water per day
- Reduces energy use and GHG emissions

*“The urinals do not have a detectable odor and seem to work as well as other water-based urinals.”*

Wendy Gibson,  
Sustainable Operations and  
Maintenance Manager,  
Facilities Services

## Performance

The waterless urinals have been performing well, but janitorial staff initially had some difficulty adjusting to the new maintenance routine. Daily cleaning is easier and takes less time, but properly removing and changing the urinal cartridge requires training. Facilities Services also had a problem with urine crystal build-up in the plumbing. After the janitorial staff was instructed to flush five gallons of hot water through the drain each time they replaced the cartridge, the problem was resolved.

Some users complained about a “splash effect,” although this may be a design issue of the particular model Facility Services is using and not necessarily representative of all waterless urinals. In fact, the manufacturer of the waterless urinals used by the City has since redesigned its urinals to include a drawing of a small blue seashell to mark where users should aim to avoid splashing.

## Lessons Learned

Before making the switch to waterless urinals, Facilities Services recommends checking the price of replacement cartridges or other parts, and factoring these expenses into cost considerations. Additionally, they advise training staff on how to clean and maintain waterless urinals to ensure the urinals perform as intended.

Waterless urinals are suitable for cast iron, galvanized steel, ABS, and PVC drain-waste-vents (DWVs). However, waterless urinals are not recommended for installation on copper DWV because copper corrodes easily. Because the urine is not diluted, uric acid can build up in copper pipes, resulting in odor problems.

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## About Facilities Services

*Facilities Services is a program of Business Operations within the Office of Management and Finance. The program is responsible for the construction, operation, and maintenance of many of the City’s buildings, including City Hall, the Portland Building, Police facilities, the Record Center, the Portland Communications Center, and the City’s seven downtown parking garages. In total, the program has responsibility for 70 buildings totaling 3 million square feet, approximately two-thirds of the City’s total building inventory.*

**For more information:** Wendy Gibson, Sustainable Operations and Maintenance Manager, Facilities Services, 503-823-1181.

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