

Getting the Job Done! How to Implement Water Conservation Projects at Schools



College Water Efficiency Group
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Presentation Outline

1. How to tell what needs to be replaced?
2. Where to get the money?
3. How to get the items replaced?
4. What technology really works?



Inside of a laboratory steam sterilizer

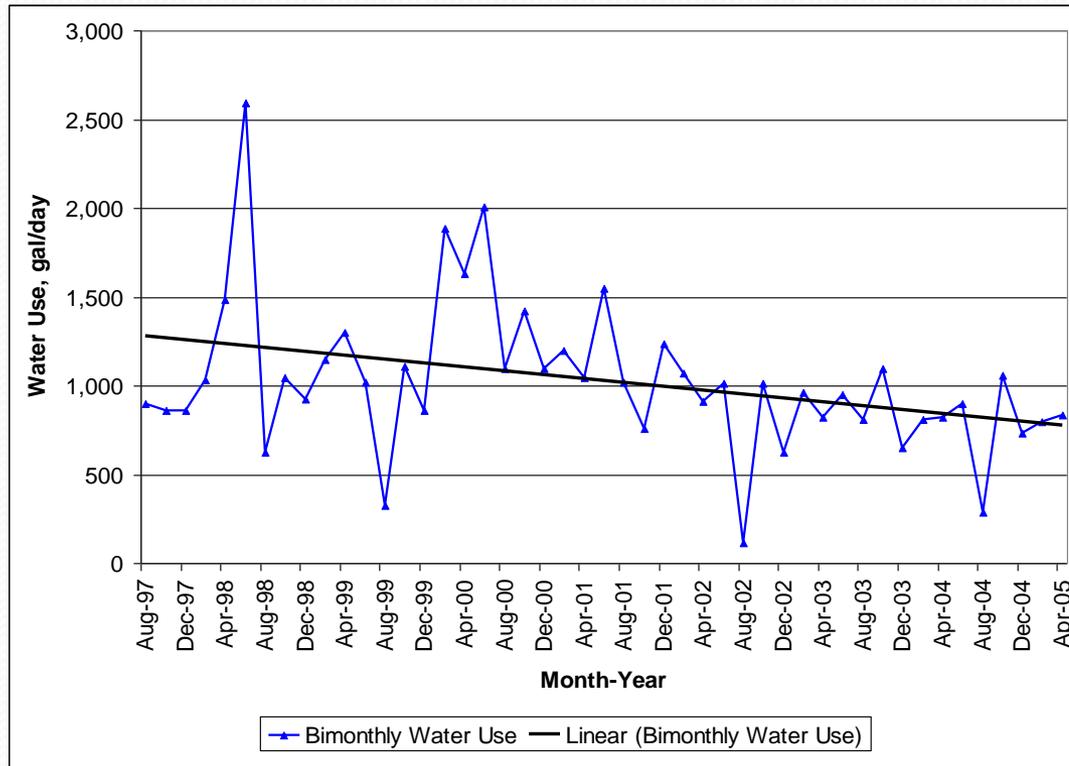
Types of Technology and Tips

- Toilets/Urinals - can be abused by students
- Faucets/Showerhead - can be tampered with
- Irrigation Controllers - often a big use for schools
- Kitchens - Ice machines, spray rinses, dishwashers, faucets, food steamers
- Dorms - clothes washers, restrooms
- Laboratories - glass washers, steam sterilizers, cage washers
- Central energy facility (HVAC)



Types of Technology and Tips

- Gather historical water meter data
- Know how to read the meter
- Know how to read water bill and graph historical use



Most Common Recommendations

- 1. Adjust toilets so they flush with the proper amount of water (1.6 gallons/flush)
- 2. Replace the high use toilets / urinals / aerators in restrooms that are high use areas
- 3. Replace irrigation controller and fine tune irrigation system

How to know what to replace?

- Testing toilets
 - Estimate flush valve volumes– $(\text{time in seconds}-1)/2$
 - Good = 4/5 sec
- Testing urinals
 - No official way to test volume
 - But you can look for age, leaks, if it flushes properly
- Test faucets
 - Time the faucets in seconds to fill a 0.25 gallon then take 15 and divide by the fill time to get gallons per minute
- Make a water budget for landscape areas

Where do I get the money?



- Look for local rebates
 - Water Utility
 - Look for future energy utility rebates from SMUD / PG&E the plan to rebate toilets / landscape equipment in the future years. They are looking for pilot projects now to demonstrate successfully implementation projects for water/energy projects
 - Consider working with multiple schools in a region and doing bulk purchases or applying for a grant together.
 - See if manufacturers would be willing to do a pilot project of their equipment.

How to get the items replaced?

- Buy in from both facilities maintenance staff and management is important!
 - Start with the simple items first
 - Try a pilot project with a few items to see that they work in the school setting
 - Look at the benefits to the school of a lower bill to get “buy in”
 - Review technology and select a good quality piece of equipment
 - Consider options for labor – union workers or contract?
 - See if manufacturers would be willing to do a pilot project of their equipment. They may offer the equipment and/or installation for free (if allowed with labor Union contracts).

Diaphragm Replacements



Part cost is ~\$35

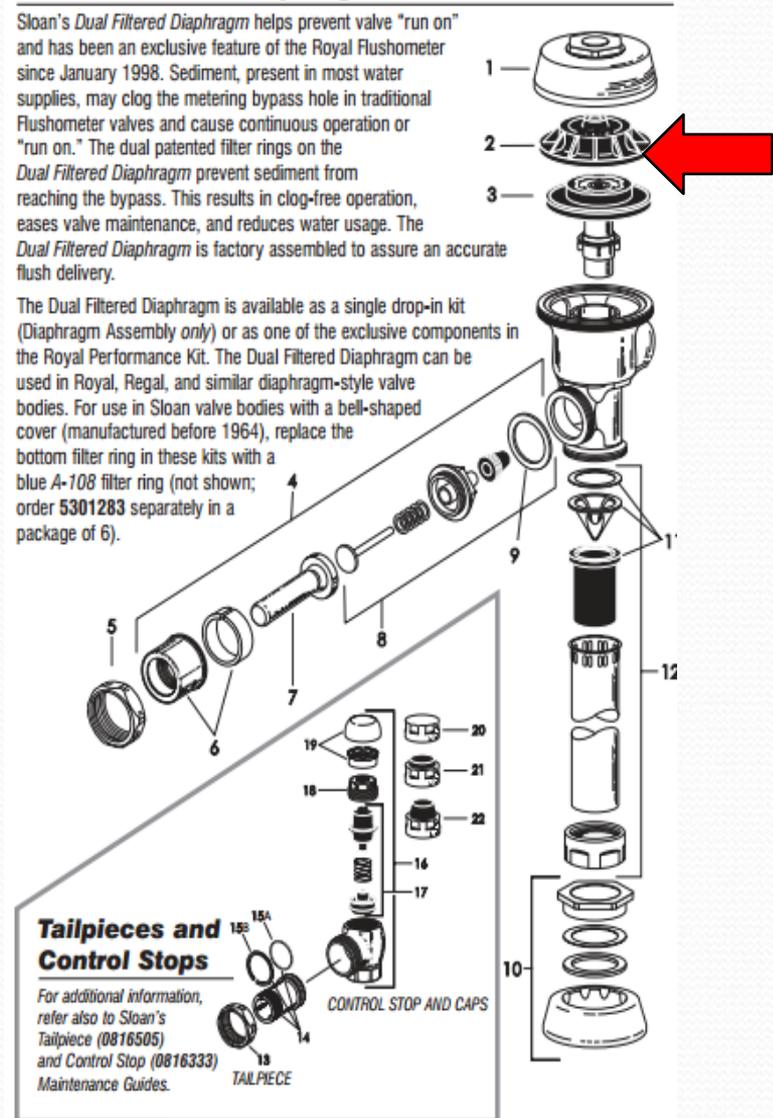
A diaphragm trap primer operates when the weight of water fills the rubber diaphragm and opens the soft rubber end, allowing the water to pass through into the floor drain.

<http://www.tesengineering.com/mep-community/?Tag=guidance&BBPage=20>

The Dual Filtered Diaphragm™

Sloan's *Dual Filtered Diaphragm* helps prevent valve "run on" and has been an exclusive feature of the Royal Flushometer since January 1998. Sediment, present in most water supplies, may clog the metering bypass hole in traditional Flushometer valves and cause continuous operation or "run on." The dual patented filter rings on the *Dual Filtered Diaphragm* prevent sediment from reaching the bypass. This results in clog-free operation, eases valve maintenance, and reduces water usage. The *Dual Filtered Diaphragm* is factory assembled to assure an accurate flush delivery.

The Dual Filtered Diaphragm is available as a single drop-in kit (Diaphragm Assembly *only*) or as one of the exclusive components in the Royal Performance Kit. The Dual Filtered Diaphragm can be used in Royal, Regal, and similar diaphragm-style valve bodies. For use in Sloan valve bodies with a bell-shaped cover (manufactured before 1964), replace the bottom filter ring in these kits with a blue A-108 filter ring (not shown; order 5301283 separately in a package of 6).



Leaks & Missing Aerators

- Common for 10-20% of toilet flappers to leak
 - Check with dye, most leaks are silent
- AWWA Leak Calculator for faucets:
 - <http://www.awwa.org/awwa/waterwiser/dripcalc.cfm>



1. Read aerator volume
2. Check screen intact
3. Check screen is not clogged



Photo: Faucet aerator with screen and label

Checking Tank Type Toilets

1. Look for stamp on porcelain for efficiency (1.6 gpf, etc.)
2. Check date stamp inside lid or back wall of tank for toilet age (if available)
3. Measure inside tank dimensions
4. Measure water displaced with flush

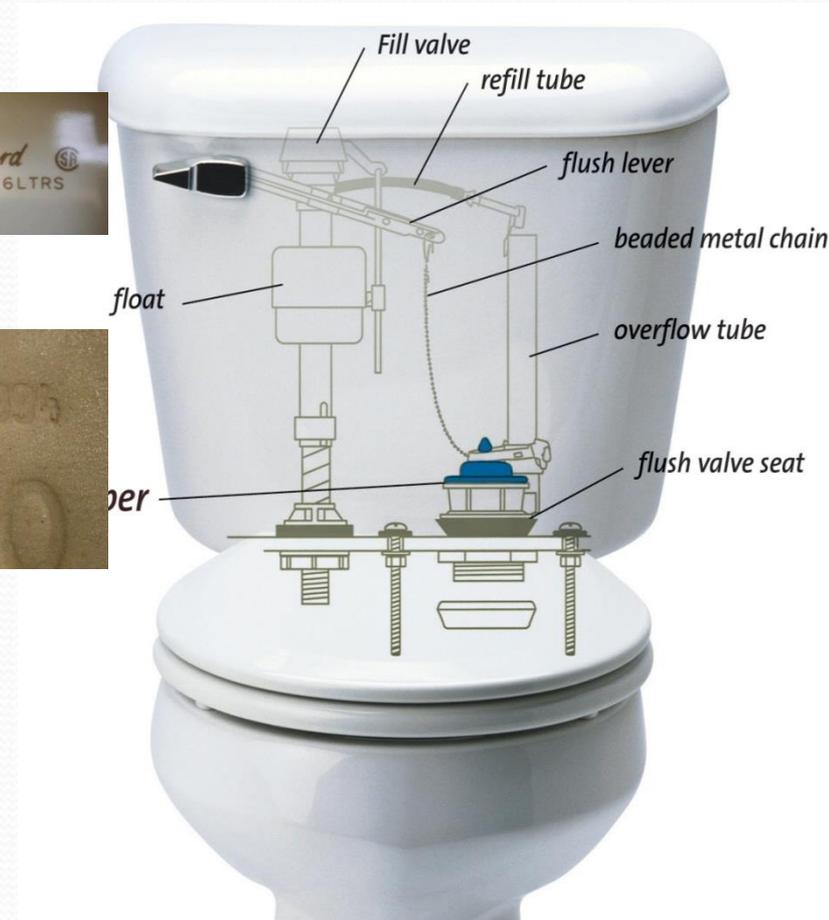


Photo Source: <http://www.toiletflapper.org>

Checking Flush Valve Type Toilets



Flush handle



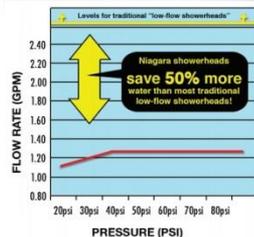
Flush valve with sensor

1. Look for leaks
2. Check flush time
3. Check proper diaphragm is installed



Checking Showerheads

- Easy to test with a bucket and a timer!
 - Gallons per minute – most are trying 1.5 gpm heads
 - High use in locker rooms and student dorms
 - Look for leaks and age of showerheads



Additional Resources

More information about brands/manufacturers:

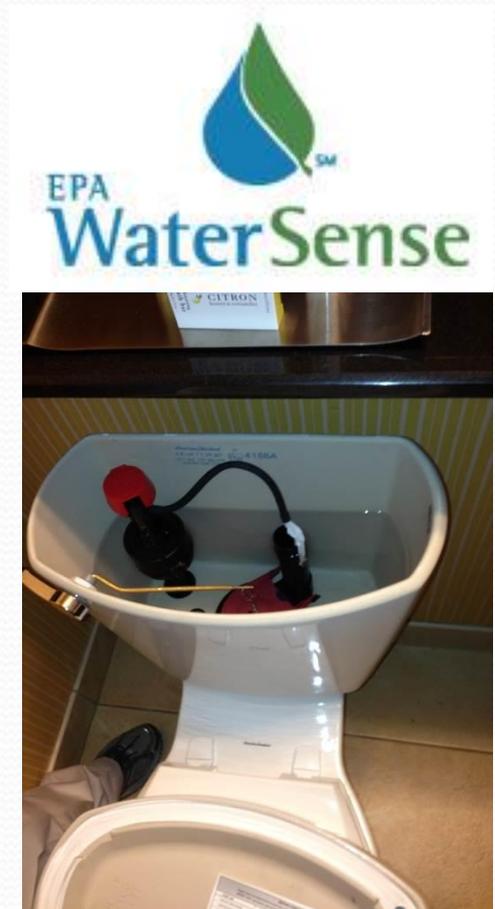
WaterSense Labeled Products found online:

www.epa.gov/watersense

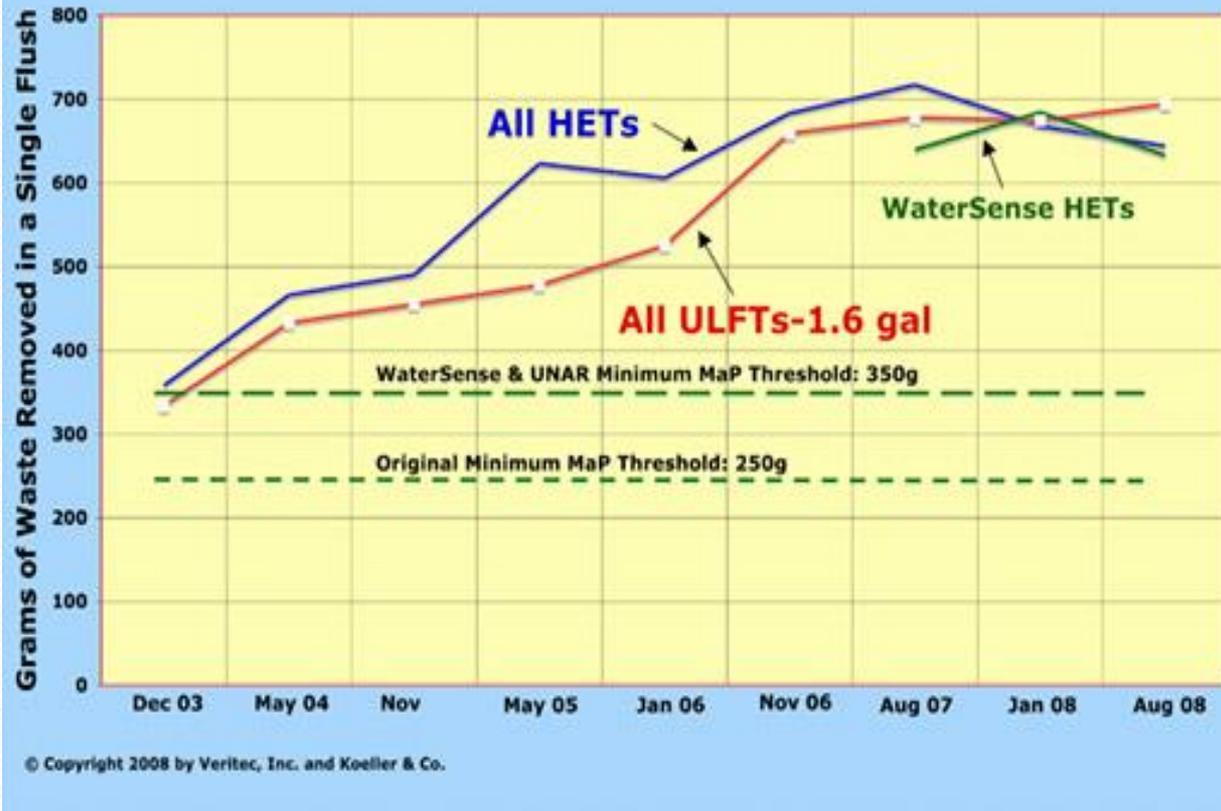
Toilets / Urinals – how to find a good brand:

Maximum Appliance Performance (MaP) Testing

www.map-testing.com



Average MaP Scores - 2003 to 2008



The higher the MaP Score the better.

Good news! The efficiency scores continue to improve over time.

HET = High Efficiency Toilet 1.28 gpf. ULFT = Ultra Low Flow Toilets 1.6 gpf.

Landscape / Irrigation

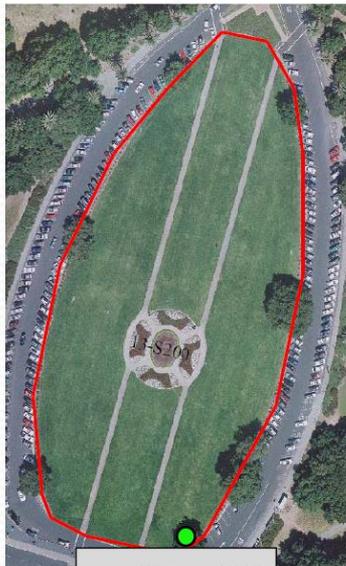


- Obtain water data for all the irrigation meters
- Obtain map of the large meters and determine what is connected to each meter
- Make a water budget for the area covered by the irrigation meter
- Review irrigation controllers
 - Manual? Automatic? Weather based? Set properly?
- Consider performing a catch can test on large turf areas
- MP Rotator head savings calculator:
<http://www.hunterindustries.com/main/water-savings-calculator>

Landscape / Irrigation

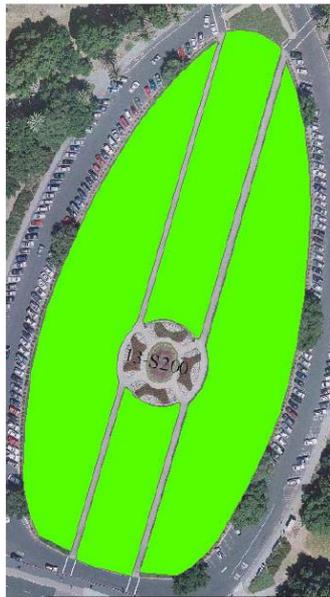
Water Budgets & Catch Can Test

Landscape Site



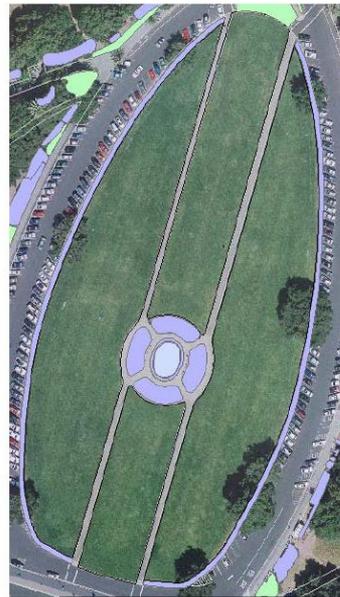
● Meter - L1172
— Site boundary

GIS Polygon Areas - Turf



Turf Area: 156,795 sqft.

GIS Polygon Areas - Non-turf



Non-turf Area: 15,293 sqft.

Catch Can Test –
Distribution
Uniformity for
specific areas of
potential
interest/concern

Water Budget using GIS -
for total water use check



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