Achieving Water Efficiency through Graywater Systems and EPA’s WaterSense Program

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Achieving Water Efficiency Through Graywater Systems and USEPA’s WaterSense Program
Today’s Discussion

- EPA Region 9’s Sustainable Water Infrastructure Program
- Introduction to Water Efficiency through Graywater Systems, Water Audits, and the WaterSense Program
- Sources of Funding & Example Projects
We provide technical assistance & funding coordination services to help communities increase:

- Water Efficiency
- Energy Efficiency
- Water Recycling
- Low Impact Development
- Renewable Energy Generation

Sustainable Infrastructure Program

- Complete an water and/or energy AUDIT
- Prioritize audit recommendations
- Identify funding to IMPLEMENT projects
Saving Water saves Energy, Saving Energy saves Water

Saving Water & Energy boosts the triple bottom line
Water Efficiency

- Drought can be a driver for long-term water efficiency improvements

- Water efficiency should be a key component to climate adaptation/resiliency planning

- The most cost effective way – by far – to expand water supplies

- Saves money by reducing
  - water system treatment and pumping costs
  - flows to wastewater systems
Short Term Actions for Long Term Benefits

- Graywater Systems
- Water Audits
- WaterSense Program Partnership, Upgrades, and New Home Certification
A “laundry-to-landscape” graywater system captures graywater from the discharge hose of your washing machine, enabling you to reuse the water without altering the existing plumbing in your home.

A “branched-drain” system is driven by gravity flow; no pressure is provided by a washing machine pump. “Branched-drain” systems usually distribute graywater from showers and/or sinks.

### Professionally-Installed

<table>
<thead>
<tr>
<th>Materials/Labor/Permit $</th>
<th><strong>Laundry to Landscape</strong></th>
<th><strong>Branched-Drain</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>$350.00</td>
<td>$500.00</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>$750.00</strong></td>
<td><strong>$1,740.00</strong></td>
</tr>
<tr>
<td>High</td>
<td>2,000.00</td>
<td>$4,250.00</td>
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</tbody>
</table>

### Homeowner-Installed

<table>
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<tr>
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<tr>
<td><strong>Average</strong></td>
<td><strong>$250.00</strong></td>
<td><strong>$715.00</strong></td>
</tr>
<tr>
<td>High</td>
<td>500</td>
<td>$1,750.00</td>
</tr>
</tbody>
</table>
Graywater – Laundry to Landscape

Note: A typical front-loading machine can distribute water up to eight locations. A typical top-loading machine can distribute water up to 12 locations.

Legend

1. 3-way valve
2. PVC 1-inch male adapter
3. 1-inch barbed male adapter
4. Hose clamp
5. PVC 1-inch x 1-½-inch bushing
6. PVC 1-½-inch female adapter (slip by FPT)
7. Auto vent (or air admittance valve)
8. 1-inch PVC tee
9. 1-inch barbed x slip adapter
10. 1-inch x ⅝-inch barbed tee or 1-inch x ½-inch Blu-Lock tee
11. “Greenback” ¼-inch ball valve
12. Barbed 1-inch female hose thread adapter (not shown)
13. 1-inch by 1-inch by 1-inch tee
14. 1-inch schedule 40 PVC pipe
15. ½-inch poly tubing
16. 1-inch HDPE tubing
17. Mulch shield or valve box

All irrigation points are 2 inches below the surface in mulch basins

End of main 1-inch line should be fully open with no plug or valve
Graywater – Branched Drain

Legend:
1. 3-way diverter valve
2. Small valve box or rigid plastic pot
3. ABS 1.5” or 2” double ell (aka twin 90)
4. ABS 1.5” or 2” double ell (aka twin 90) with inspection/clean-out port
5. 1.5” or 2” long sweep 90° bend
6. Optional 3-way valve actuator
7. Backwater valve
Including a portion of faucet flows (i.e. bathroom faucet flows), graywater comprises more than one-half of the water used indoors.

Average indoor residential water use = 69 Gallons Per Capita Per Day (GPCD); average outdoor use = 101 GPCD. Assuming 50% of used indoor water is graywater, the average American could redirect **34.5 GPD** to a garden (thereby cutting outdoor potable water use by about 1/3).
Wastewater Benefits of Graywater

• Less wastewater flow to treatment and disposal

• Can help reduce the size of new drainfields, and cost effectively mitigate failing drainfields
  • Cost savings, reduced surfacing, lowers risk of contaminating ground water

• For example, an average home could reduce about 138 gal of wastewater flow per day, reducing the required drainfield size by 230 square feet
Questions:

How much of the water that your system produces and/or purchases is delivered to an end user?

How much is it costing you to not know that information?
Water Audits

• Identify “Non-Revenue” water using AWWA’s Free Water Audit Software or other methods
  • Real losses, i.e. leaks
  • Apparent losses, i.e. unbilled/unmetered consumption

• Complete leak detection surveys and determine corrosion rates to target pipe replacement

• Optimize pressure zones (direct relationship between increasing pressure and water loss)

• Recommend metering systems
  • And subsequently determine appropriate rate structures
From 2006-2012, WaterSense products helped consumers save:

- 487 billion gallons of water
- 64.7 billion kilowatt hours of electricity
- $8.9 billion on water and energy bills
- 24 million metric tons of carbon dioxide
• Replace low efficiency fixtures with WaterSense certified toilets, faucets, and showerheads
  • Also ENERGY STAR certified washing machines and dishwashers
Become a WaterSense Partner to gain access to Ready-to-Go Outreach materials, have membership in a national network, and be nationally recognized as a leader in water efficiency.
Imagine your kids running through the water sprinkler, minus the water.

We’re for Water

Fix a Leak Week
March 12-18, 2012

Curb your water waste!
Set Ordinances to Build WaterSense Labeled New Homes

Compared to a typical home, a WaterSense labeled new home can save a family of four 50,000 gallons of water a year or more. That's enough to wash 2,000 loads of laundry and could amount to utility bill savings of up to $600 each year.
Water Efficiency Funding

- Capital Improvement Funds
  www.epa.gov/region9/water/tribal/index.html

- EPA SRF Tribal set-aside

- HUD- Community Development Block Grant Program
  portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

- USDA- Rural Development

- USBR WaterSMART grants
  www.usbr.gov/WaterSMART/grants.html

- California-specific funding
  - e.g. Infrastructure and Economic Development Bank
    http://ibank.ca.gov/infrastructure_loans.htm
  - See CFCC website for more:
    www.cfcc.ca.gov/
Water Efficiency Examples

- WaterSense Partner
- **Choctaw Nation**
  - Meter installation and backwash water recycling
- **White Mountain Apache Tribe** (SRF funding)
  - Improve distribution systems
- **Hoopa Valley Tribe** (USBR funding)
  - Incentivize graywater systems & rainwater harvesting, establish ordinances, set up pilot projects
  - Upgrade to energy efficient pumps
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www.epa.gov/region09/waterinfrastructure