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

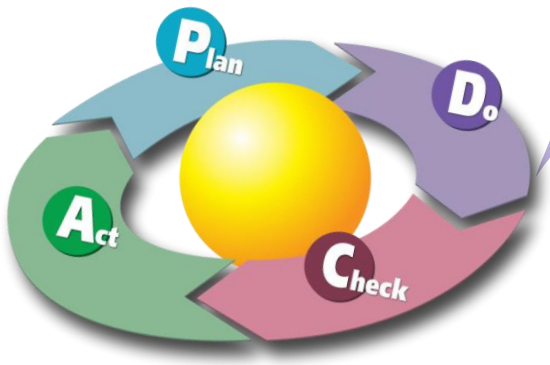
Today's Discussion

- 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

Sustainable Infrastructure Program

We provide technical assistance & funding coordination services to help communities increase:

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



Complete an water and/or energy AUDIT

Prioritize audit recommendations

Identify funding to IMPLEMENT projects


Saving Water Saves Energy
Saving Energy Saves Water
WaterSense
Meets EPA Criteria
Energy
Saving Water & Energy boosts the triple bottom line

Water Efficiency

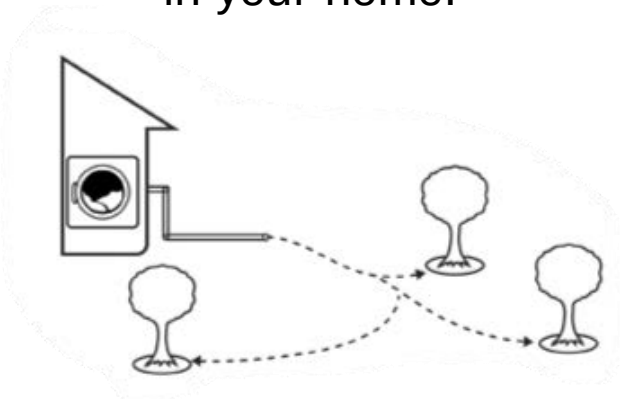
- Drought can be a driver for long-term water efficiency improvements
- Water efficiency should be a key component to climate adaptation/resiliency planning
- The most cost effective way – by far – to expand water supplies
- Saves money by reducing
  - water system treatment and pumping costs
  - flows to wastewater systems

Short Term Actions for Long Term Benefits

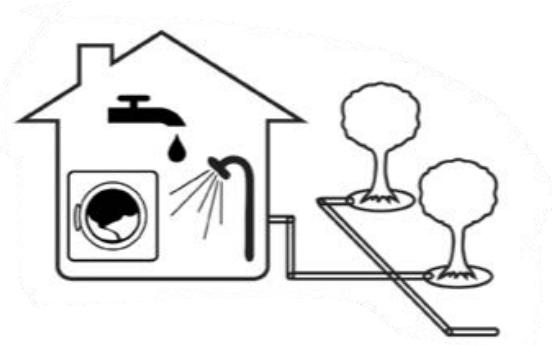
- Graywater Systems
- Water Audits
- WaterSense Program Partnership, Upgrades, and New Home Certification

GREYWATER BASICS COSTS & SYSTEM DESIGN

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.



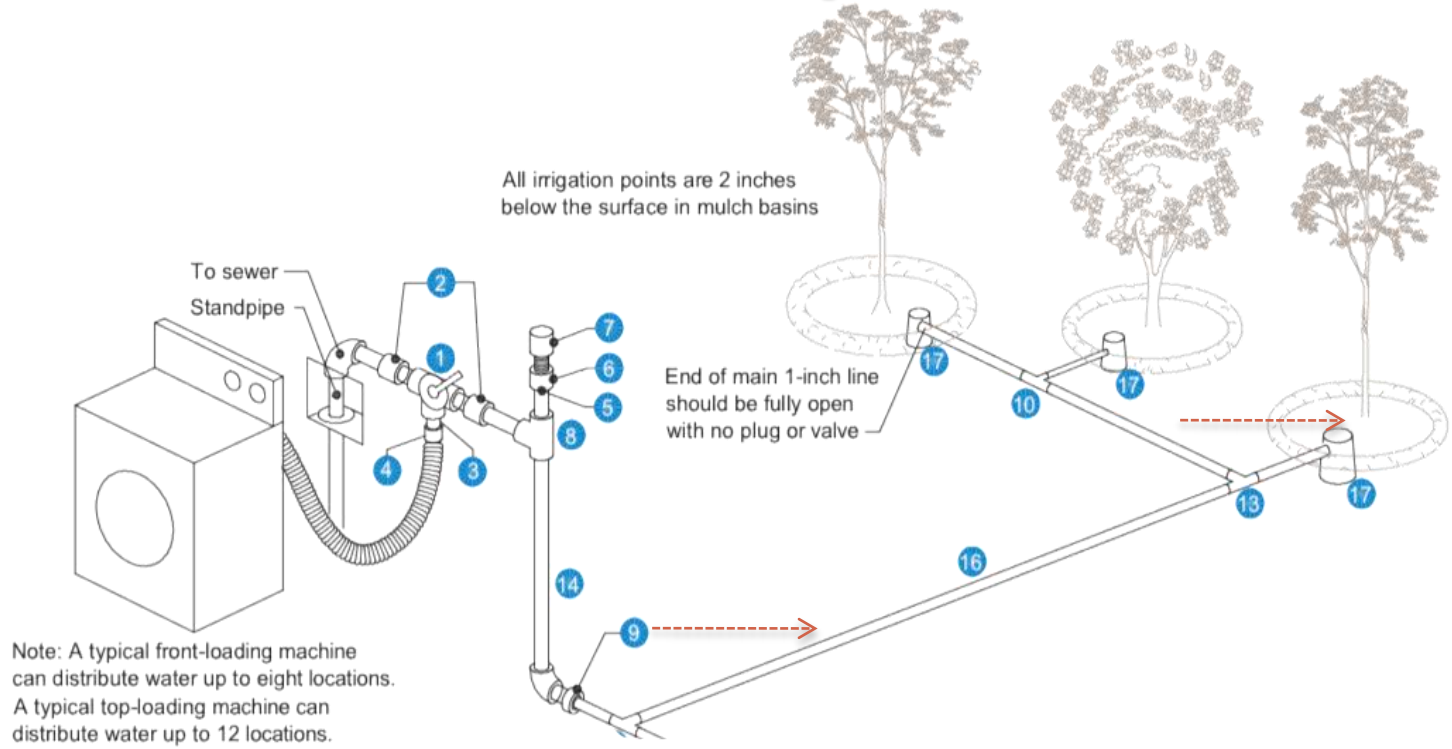
Professionally-Installed

Materials/Labor/Permit $	**Laundry to Landscape**	**Branched-Drain**
Low	$350.00	$500.00
Average	**$750.00**	**$1,740.00**
High	2,000.00	$4,250.00

Homeowner-Installed

Materials/Labor/Permit $	**Laundry to Landscape**	**Branched-Drain**
Low	$100.00	$250.00
Average	**$250.00**	**$715.00**
High	500	$1,750.00

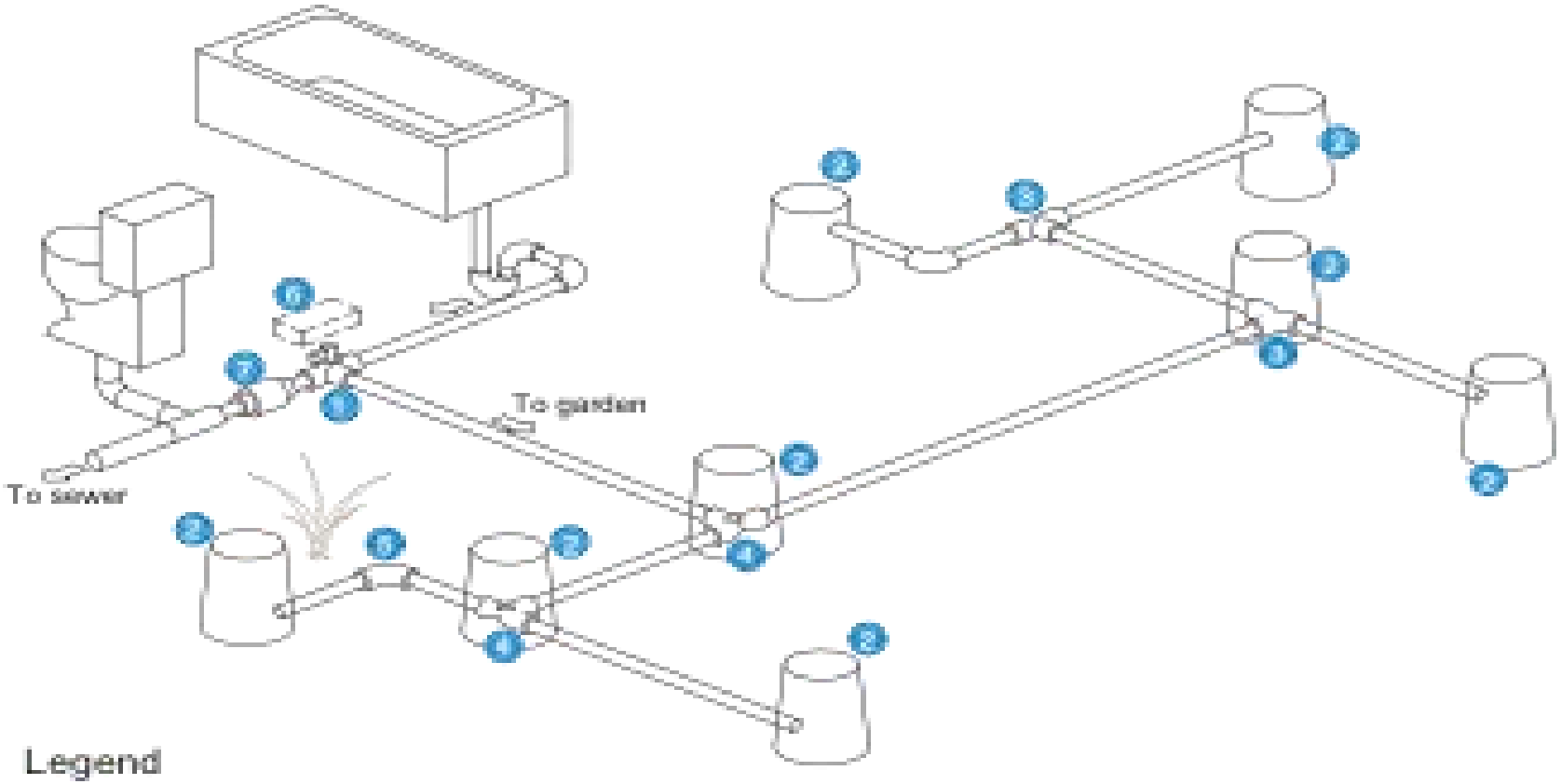
Graywater – Laundry to Landscape



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 1½-inch bushing
6. PVC 1½-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 ½-inch barbed tee or 1-inch x ½-inch Blu-Lock tee
11. "Greenback" ½-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

Graywater – Branched Drain

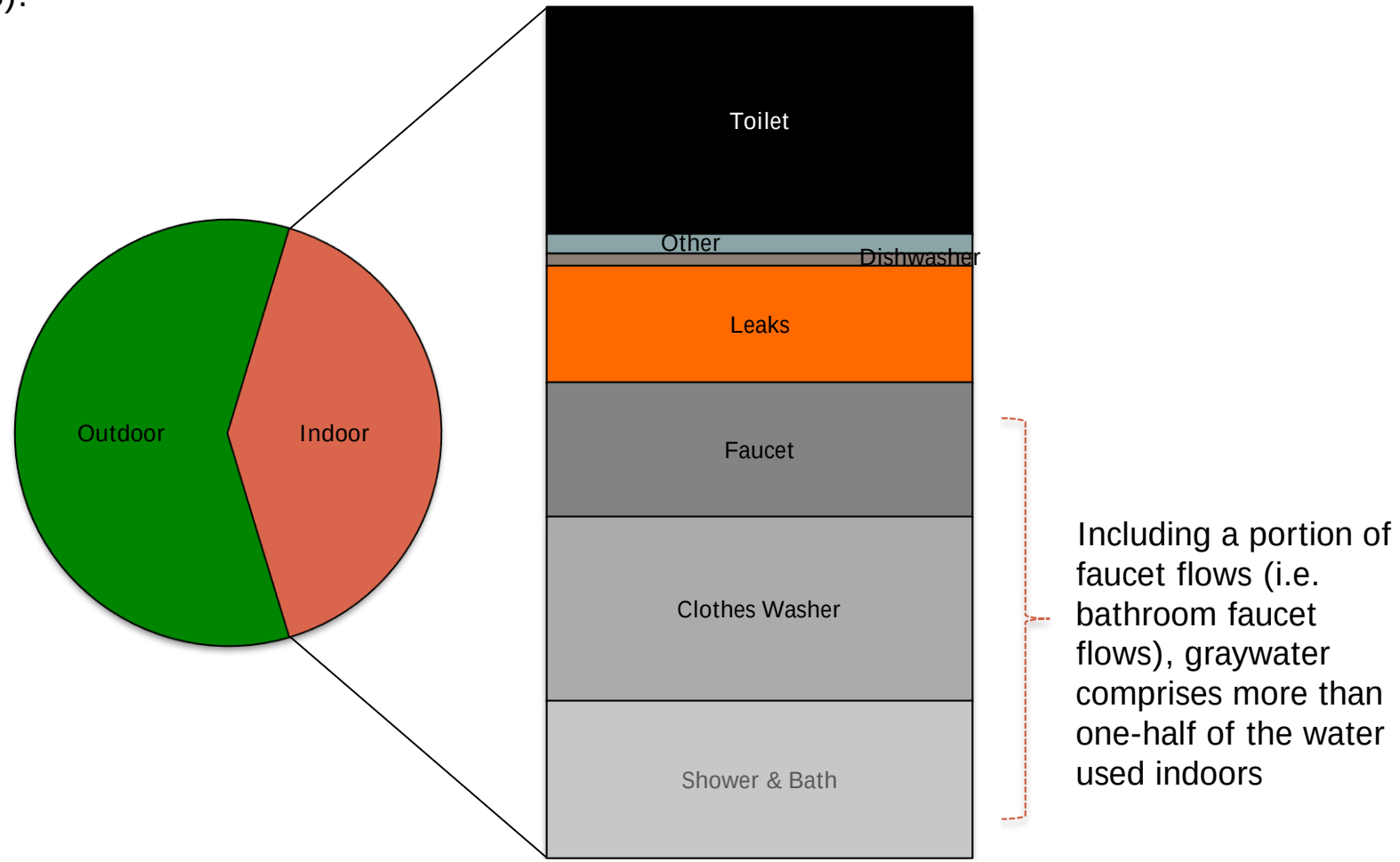


Legend

1. 3-way diverter valve
2. Small valve box or rigid plastic pot
3. ABS 1.5" or 2" double sil (aka twin 90)
4. ABS 1.5" or 2" double sil (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

Graywater Savings

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*

Water Audits

<u>Questions</u>:

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

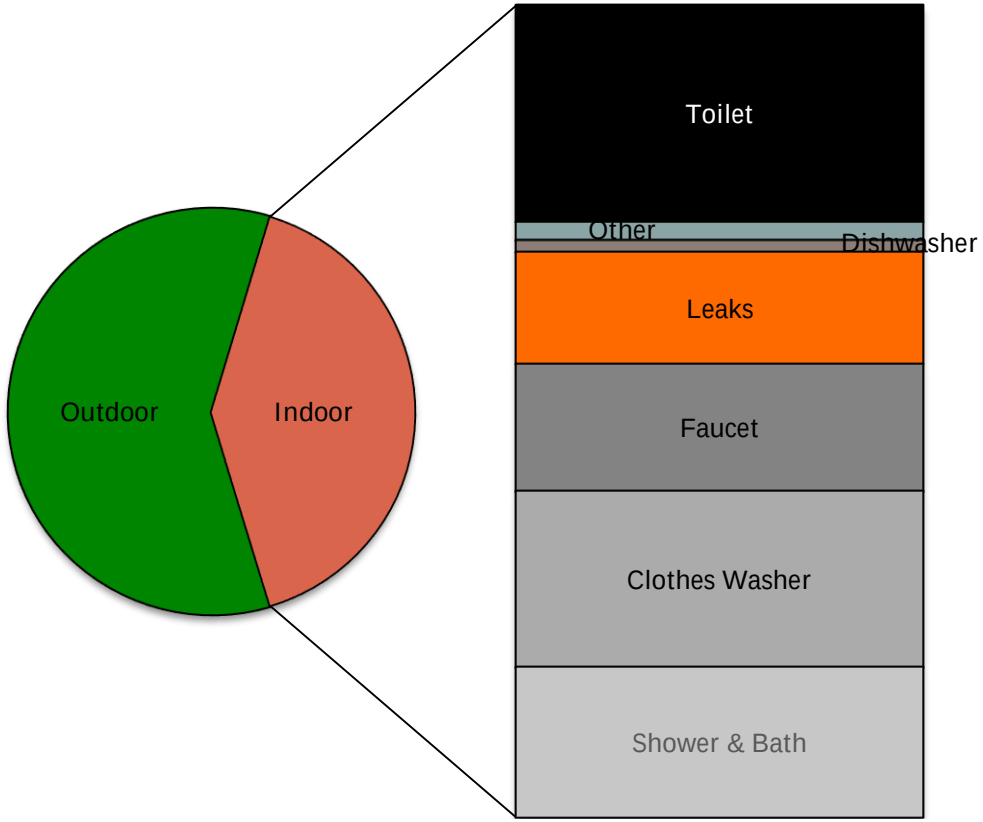
WaterSense

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

WaterSense

- Replace low efficiency fixtures with WaterSense certified toilets, faucets, and showerheads
  - Also ENERGY STAR certified washing machines and dishwashers

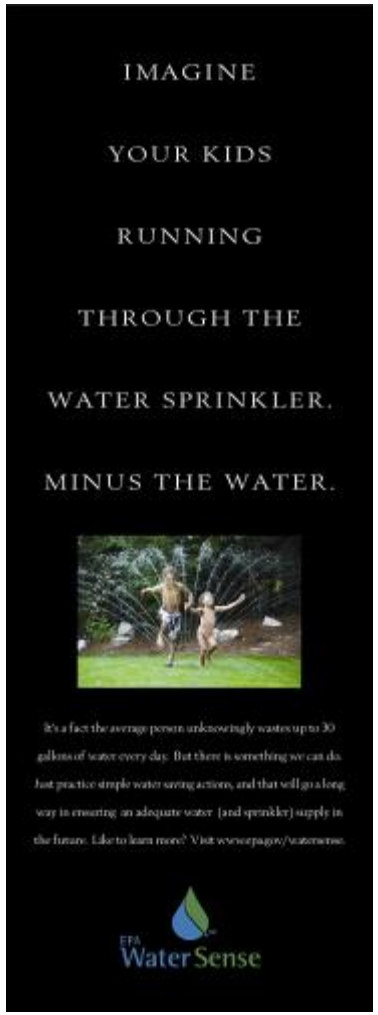


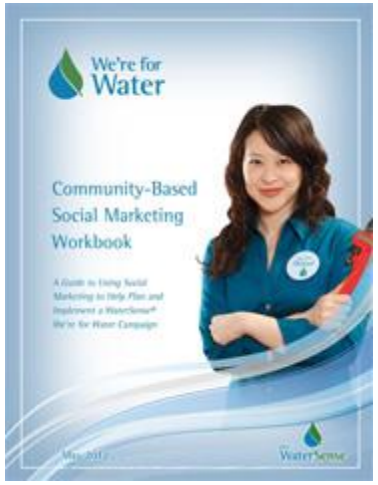
WaterSense

- 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.

EPA WaterSense PARTNER

Sample Partner Resources





WaterSense

- 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
- EPA SRF Tribal set-aside

www.epa.gov/region9/water/tribal/index.html

- HUD- Community Development Block Grant Program

portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

- USDA- Rural Development

www.rurdev.usda.gov/RD_Grants.html

- 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