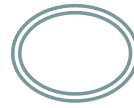
The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

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

Eric Byous, Water Division, Sustainable Infrastructure Program

RTOC – Spring Meeting

May 1, 2014



**Achieving Water Efficiency Through
Graywater Systems and USEPA's
WaterSense Program**

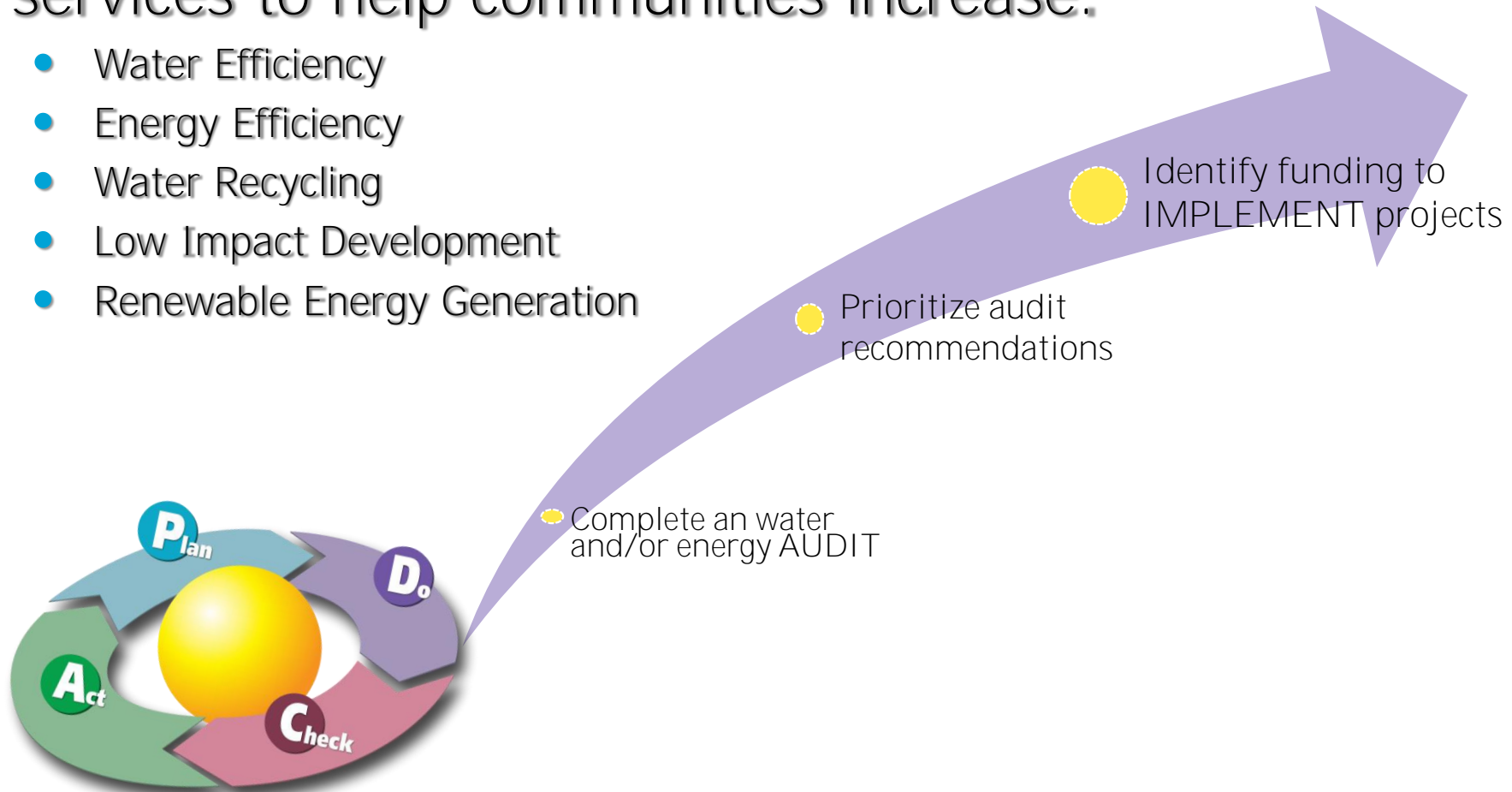
Today's Discussion

- 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

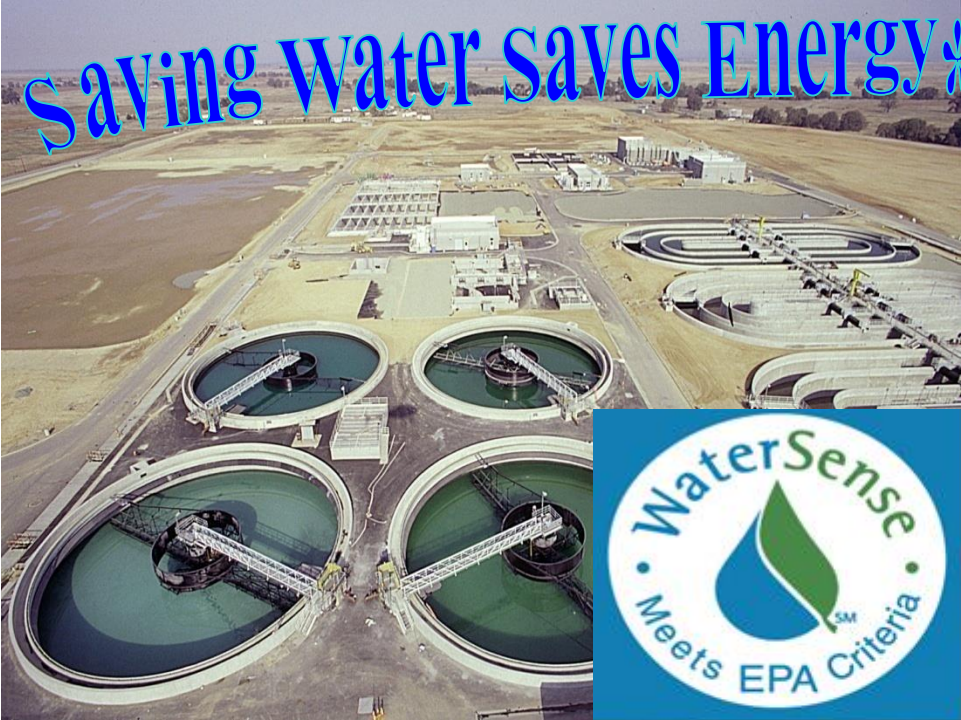
Sustainable Infrastructure Program

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

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



*Saving Water Saves Energy * Saving Energy Saves Water*



Saving Water & Energy boosts the triple bottom line

Water Efficiency

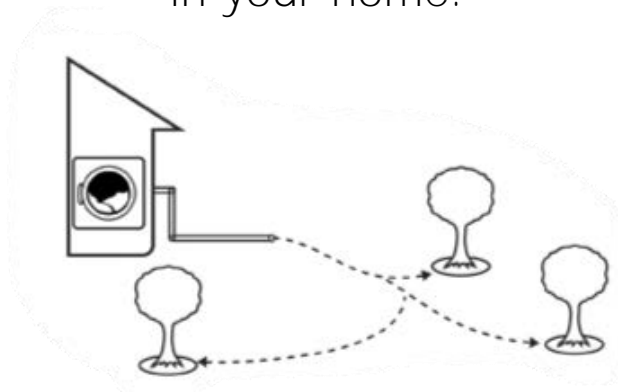
- Drought can be a driver for long-term water efficiency improvements
- Water efficiency should be a key component to climate adaptation/resiliency planning
- The most cost effective way – by far – to expand water supplies
- Saves money by reducing
 - water system treatment and pumping costs
 - flows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

Short Term Actions for Long Term Benefits

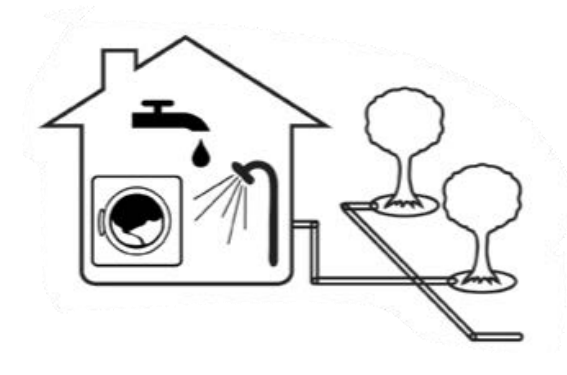
- Graywater Systems
- Water Audits
- WaterSense Program Partnership, Upgrades, and New Home Certification

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 \$

Low

Average

High

Laundry to Landscape

\$350.00

\$750.00

2,000.00

Branched-Drain

\$500.00

\$1,740.00

\$4,250.00

Homeowner-Installed

Materials/Labor/Permit \$

Low

Average

High

Laundry to Landscape

\$100.00

\$250.00

500

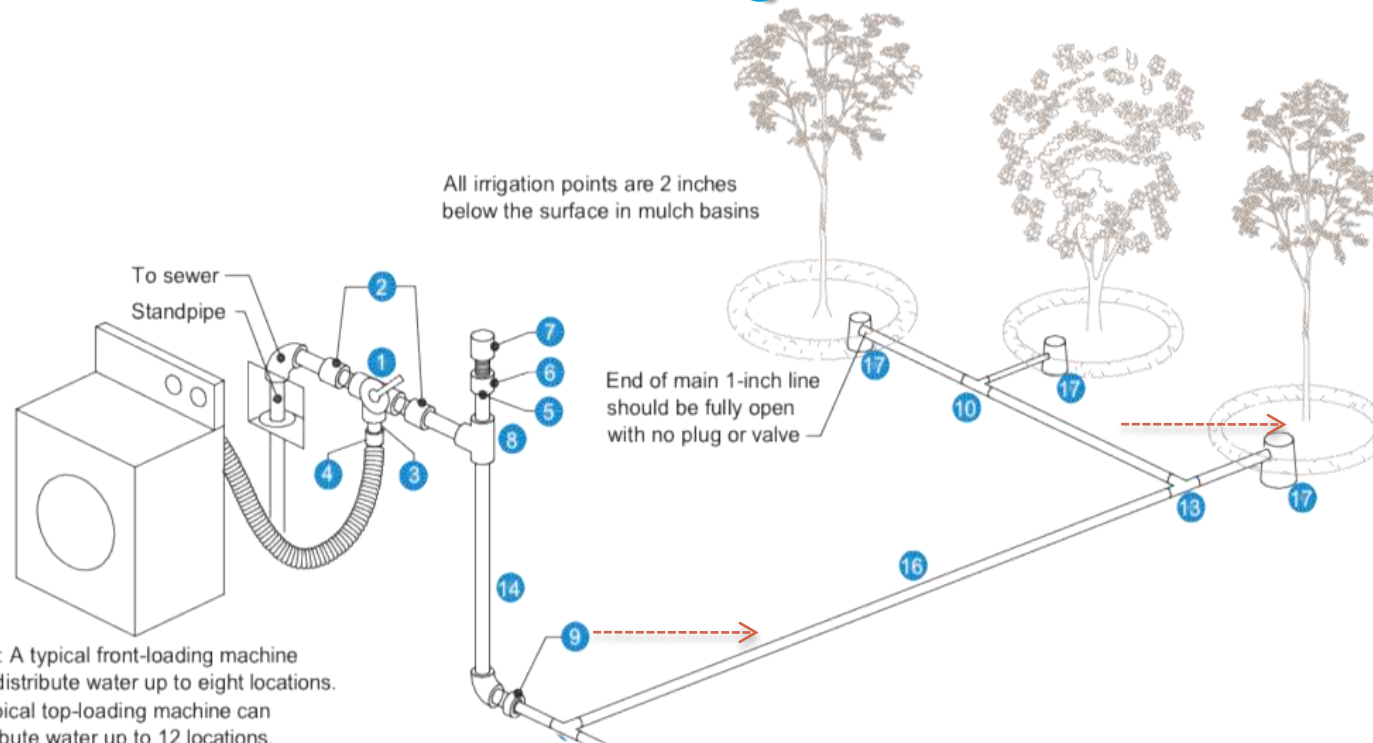
Branched-Drain

\$250.00

\$715.00

\$1,750.00

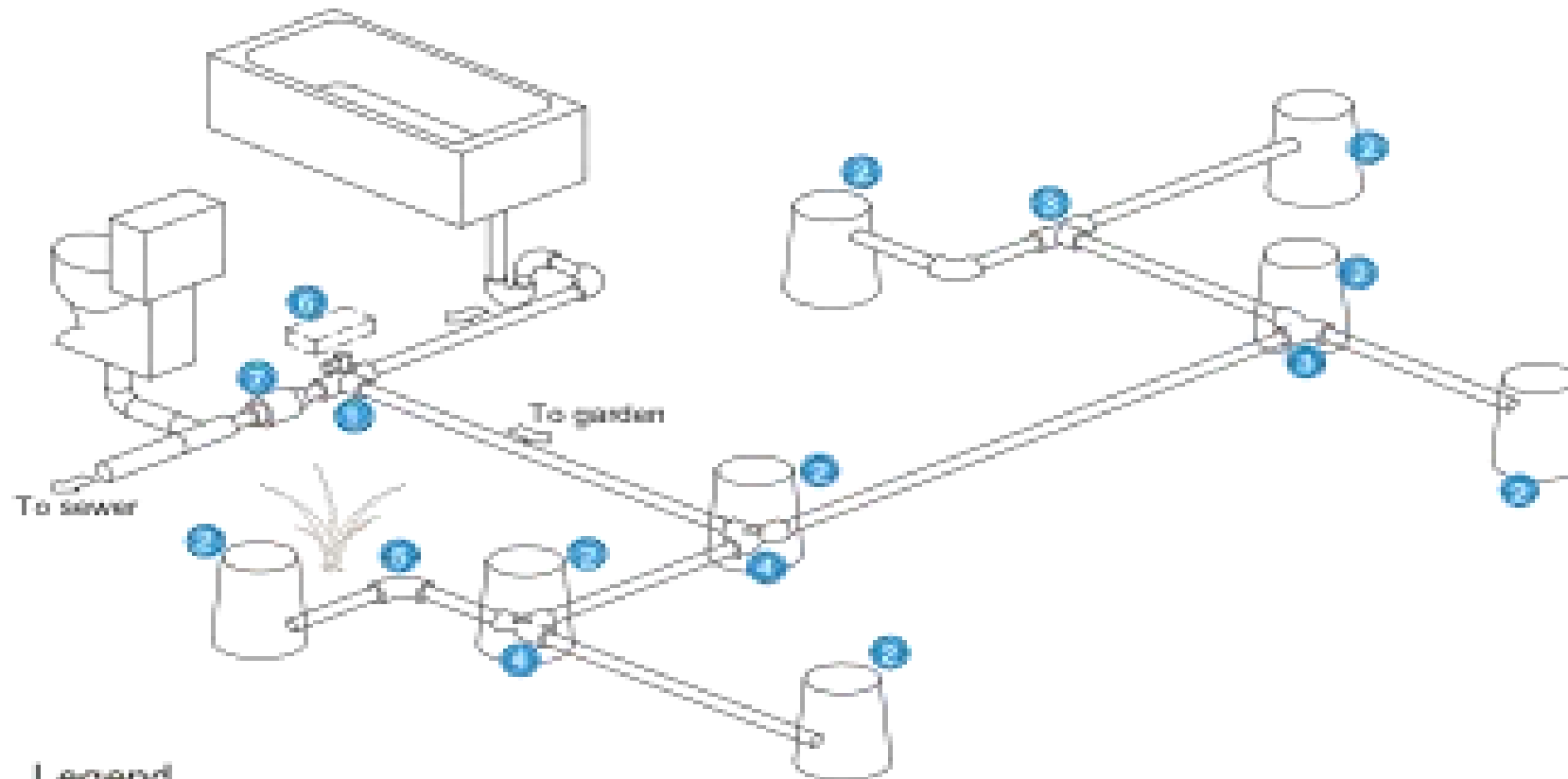
Graywater – Laundry to Landscape



Legend

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

Graywater – Branched Drain

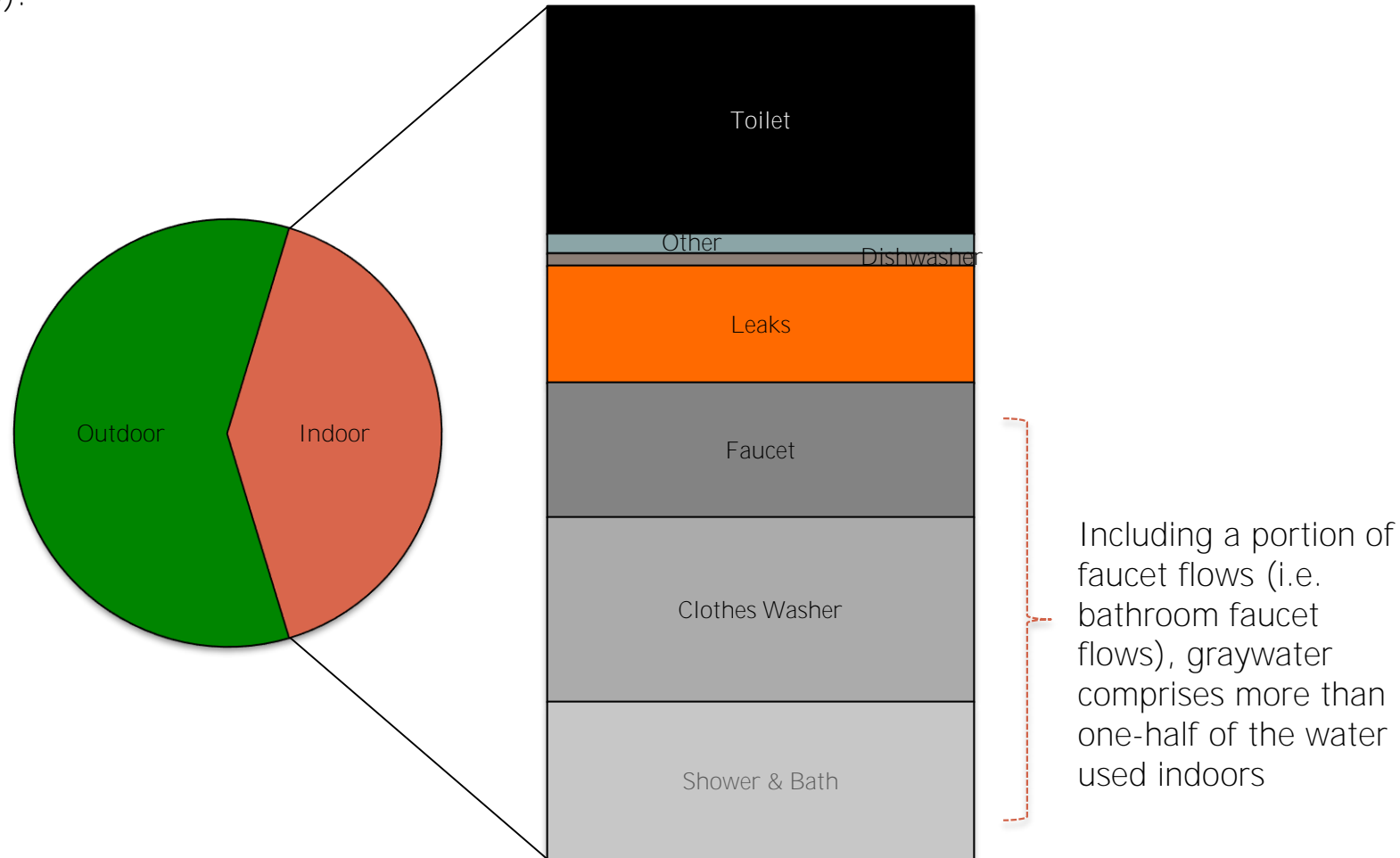


Legend

- | | |
|--|----------------------------------|
| 1 3-way diverter valve | 5 1.5" or 2" long sweep 90° bend |
| 2 Small valve box or rigid plastic pot | 6 Optional 3-way valve actuator |
| 3 ABS 1.5" or 2" double ell (aka twin 90) | 7 Backwater valve |
| 4 ABS 1.5" or 2" double ell (aka twin 90) with inspection/clean-out port | |

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

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

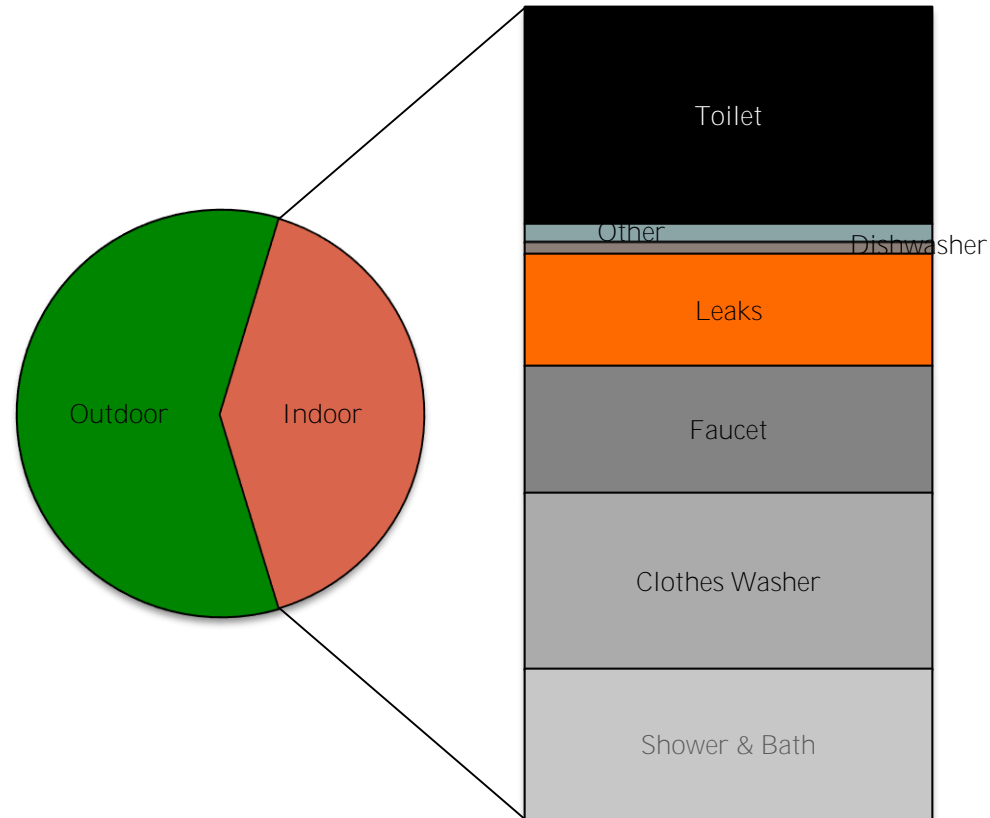
WaterSense

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.



Sample Partner Resources

IMAGINE
YOUR KIDS
RUNNING
THROUGH THE
WATER SPRINKLER.
MINUS THE WATER.



It's a fact the average person unknowingly wastes up to 30 gallons of water every day. But there is something we can do: just practice simple water saving actions, and that will go a long way in ensuring an adequate water (and sprinkler) supply in the future. Like to learn more? Visit www.epa.gov/watersense.




Be proud. Be strong.
Be a fixer of leaks.



Search for water leaks, then practice the fixing and being leaky in homes can save thousands of gallons every year. It's no secret that thoughts go to the kitchen sink in the kitchen, bathroom and backyard. The WaterSense website is full of water-saving tips to help eliminate all those leaks and drops. So join me and thousands of our neighbors in the We're for Water campaign. Together we can shut up the water by making simple changes at home.



www.epa.gov/watersense



Fix a Leak Week
March 12-18, 2012



Color These Water Wasters—But Don't Be One!




Drip, Drip, Drip.

Color the water wasters. But don't be one! WaterSense is a national campaign to help you save water. It's all about making simple changes at home to save water. WaterSense is a national campaign to help you save water. It's all about making simple changes at home to save water.

Drip. Drip. Drip.

Hi, I am Flo, the We're for Water spokesgallon. In the United States, leaks in our homes waste enough water for every kid to take a bath every day. Help me complete the activities inside to fix the leaks and save water!



We're for Water

Community-Based Social Marketing Workbook

A Guide to Using Social Marketing to Help Plan and Implement a WaterSense® We're for Water Campaign



May 2012



As much as **50 percent** of the water we use outdoors is **wasted** from inefficient watering methods and systems.

Curb your water waste!



How to feel good about yourself every time you pay the water bill.

Saving money is as easy as 1-2-3:

1. Check your toilet for leaks.
2. Twist on a faucet aerator.
3. Replace an old showerhead with one that's WaterSense labeled.



We're for Water



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** ([SRE](#) 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

Contact Information

Eric Byous
(415) 972-3531
byous.eric@epa.gov

Charlotte Ely
(415) 972-3731
ely.charlotte@epa.gov

www.epa.gov/region09/waterinfrastructure