



State of Oregon
Department of
Environmental
Quality

Graywater Reuse and Disposal Systems

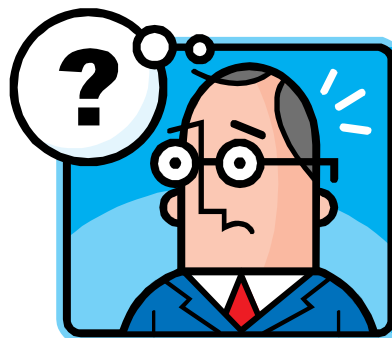
Using Graywater in the Landscape

Ashland Community Graywater Informational Meeting
June 23, 2012

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Graywater Reuse and Disposal Systems

Why are *you* here?

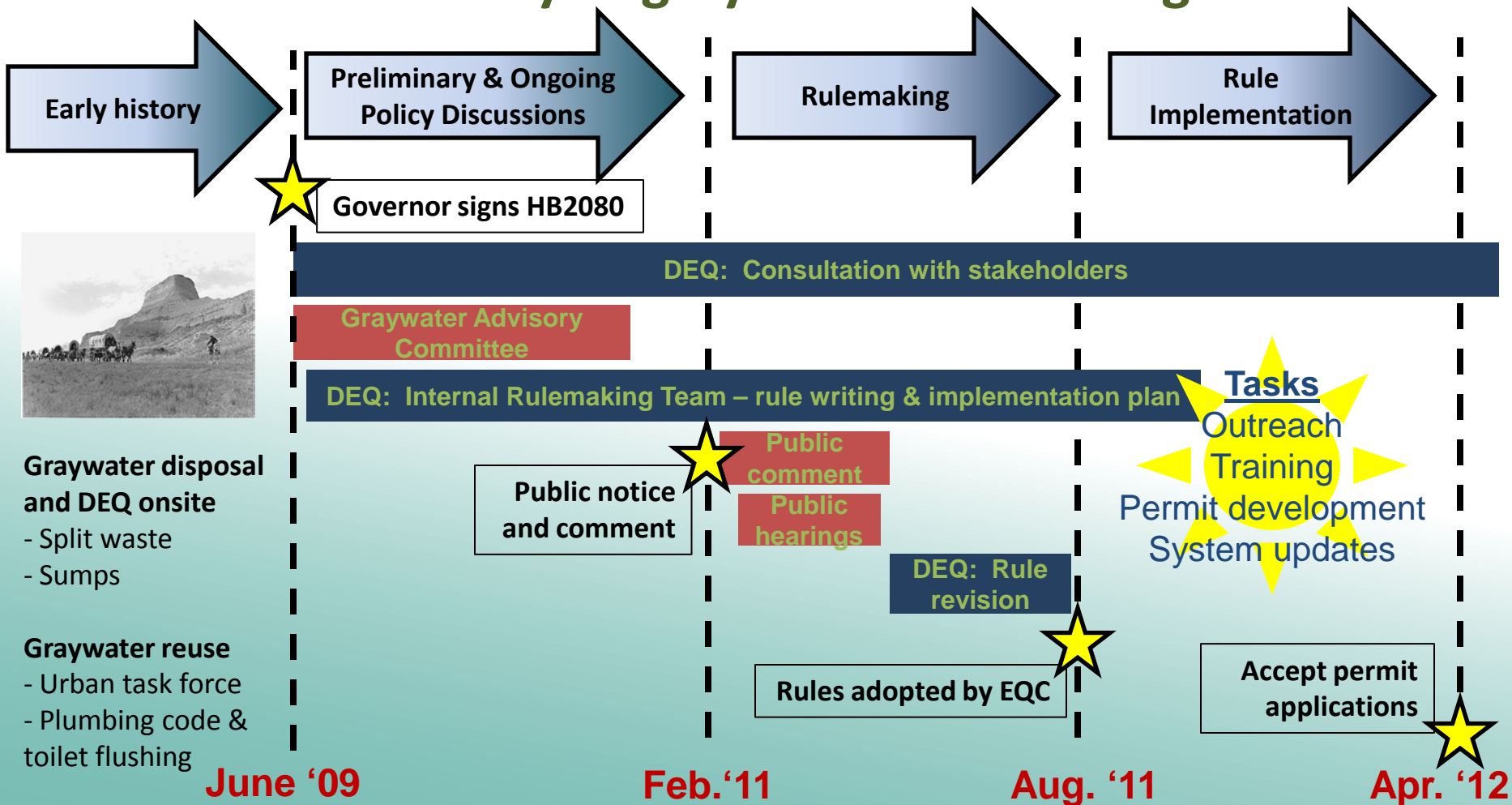




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Graywater Reuse and Disposal Systems

What's the history of graywater use in Oregon?

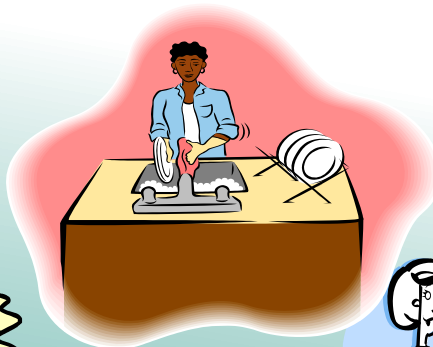


Graywater Reuse and Disposal Systems

What is graywater?

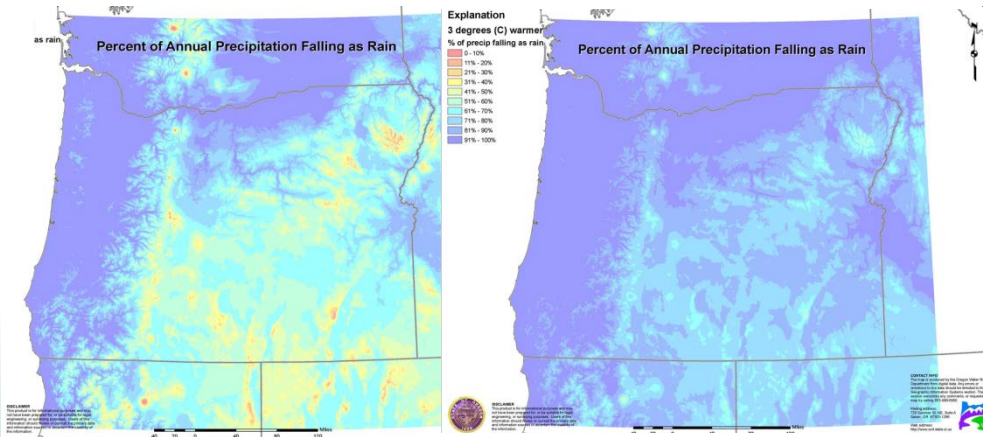
- Graywater means shower and bath wastewater, bathroom sink wastewater, kitchen sink wastewater, and laundry wastewater.
- Graywater does not mean toilet or garbage wastes or wastewater contaminated by soiled diapers.

[ORS 454.605]

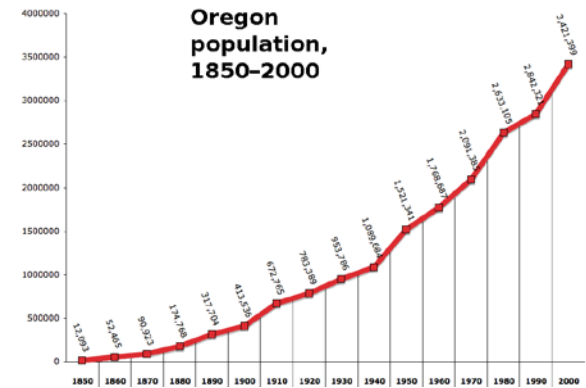


Graywater Reuse and Disposal Systems

Why use graywater?



Changing climate



Increasing demand



Conflicting uses



Allocated streams

Graywater Reuse and Disposal Systems



Save treatment costs at WWTP



Reduce thermal discharges to Bear Creek



Save money by reducing use of potable water for non-potable uses, such as irrigation

Graywater Reuse and Disposal Systems

Household water management strategies

- Reduce your water use
- Reuse your graywater
- Recycle excess water to the sewer or septic system



Graywater Reuse and Disposal Systems

What's in graywater?



Graywater Reuse and Disposal Systems

- Graywater shares similar chemical and biological characteristics with combined household wastewater, but typically at lower concentrations.
- Organic material (BOD/COD)
- Solids (TSS)
- *Limited* nutrients (N, P)
- Oil and grease
- Bacteria
- Household chemicals used in bathing, cleaning, hobbies, home maintenance, etc.





Graywater Reuse and Disposal Systems

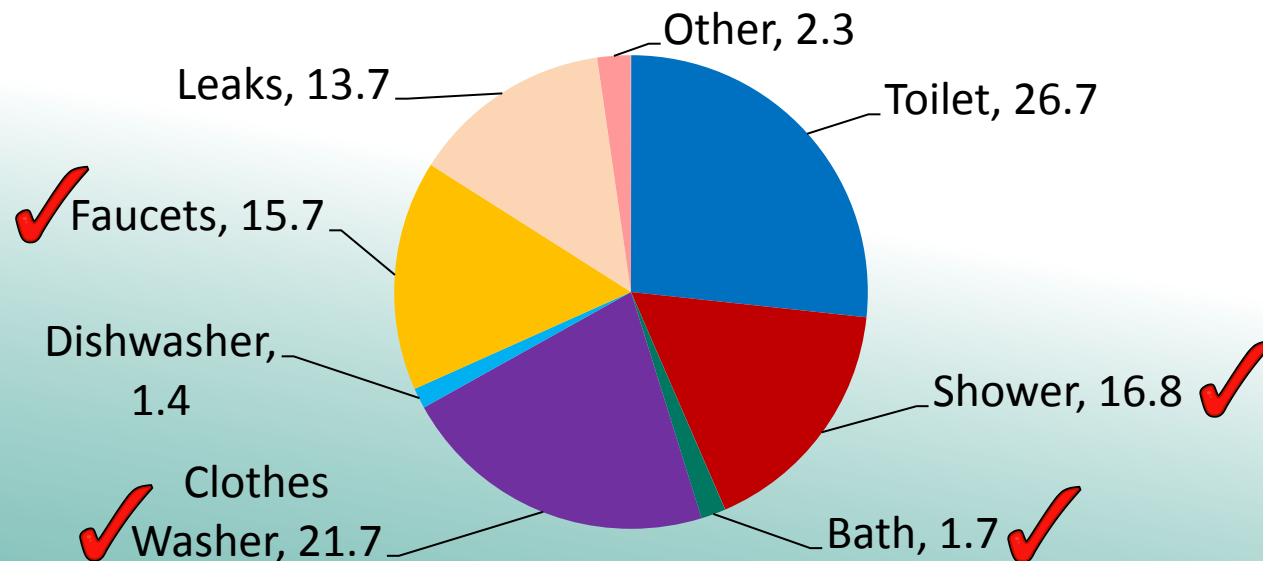
- Graywater will contain whatever you put down the drain
- It's not toilet water, but it's not drinking water either!

Showers & baths	Bathroom sinks	Laundry	Kitchen sinks
<ul style="list-style-type: none">• Relatively clean• Predictable volume and frequency	<ul style="list-style-type: none">• Higher concentrations of hair, toothpaste, shaving cream, etc.• Low volume	<ul style="list-style-type: none">• Predictable volume and frequency• Easy to retrofit• High concentration of lint and fiber• Detergents can be hard on plants.• Alkaline pH and B can affect plants	<ul style="list-style-type: none">• <u>No dishwashers or garbage disposals</u>• "Dirtiest" source of graywater• May contain fats, oils, grease, and solids• May contain bacteria, viruses, and other microorganisms• Requires special plumbing for use

Graywater Reuse and Disposal Systems

How much graywater is produced?

- 60% of household wastewater originates from graywater sources
- An average household produces approximately 90-110 gallons of graywater per day



Average indoor water use for 12 North American cities for fixture or appliance. Data expressed at percent total flow, which averaged 69.3 gallons per capita per day. (Data adapted from the 1999 American Water Works Association Research Foundation's Residential End Use of Water Study.)



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Graywater Reuse and Disposal Systems

Is graywater safe to use?

No reported illnesses due to graywater reuse.

However...

No studies show that illness in households using graywater has not been caused by graywater.

But...

Graywater advocates, experts, and regulators agree that graywater can be safely (re)used for some application with some basic precautions.



In Oregon, the requirements for the safe use of graywater are described in:

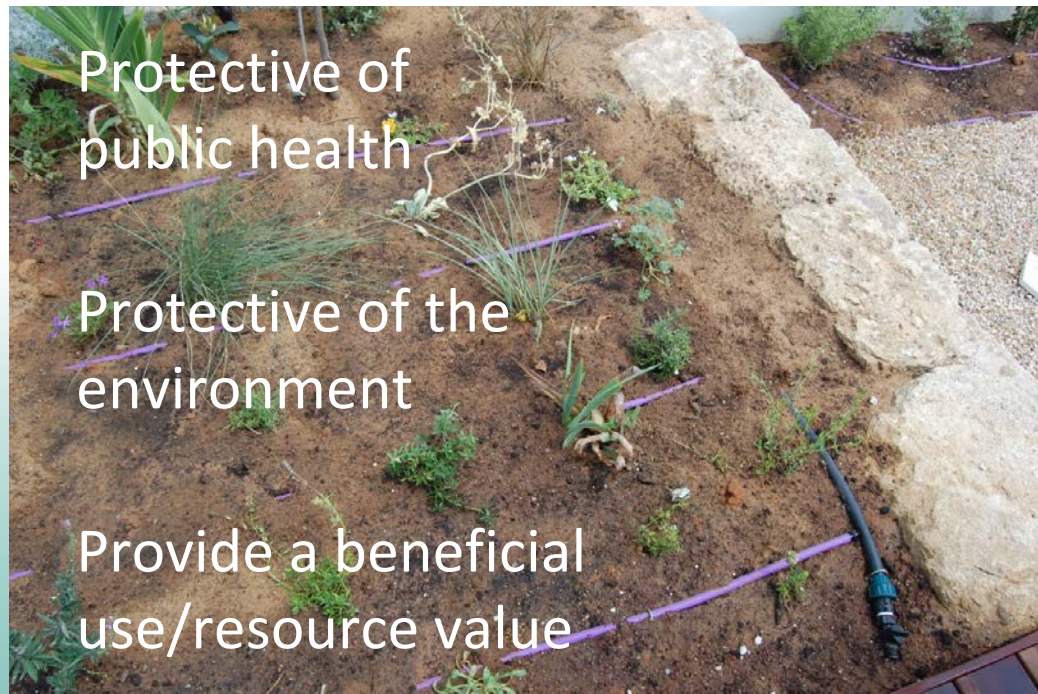
Oregon Administrative Rules Chapter 340, Division 053:
Graywater Reuse and Disposal Systems



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Graywater Reuse and Disposal Systems

It is the public policy of the State of Oregon to **encourage** ... the appropriate **reuse** of graywater for **beneficial uses**.



Protective of
public health

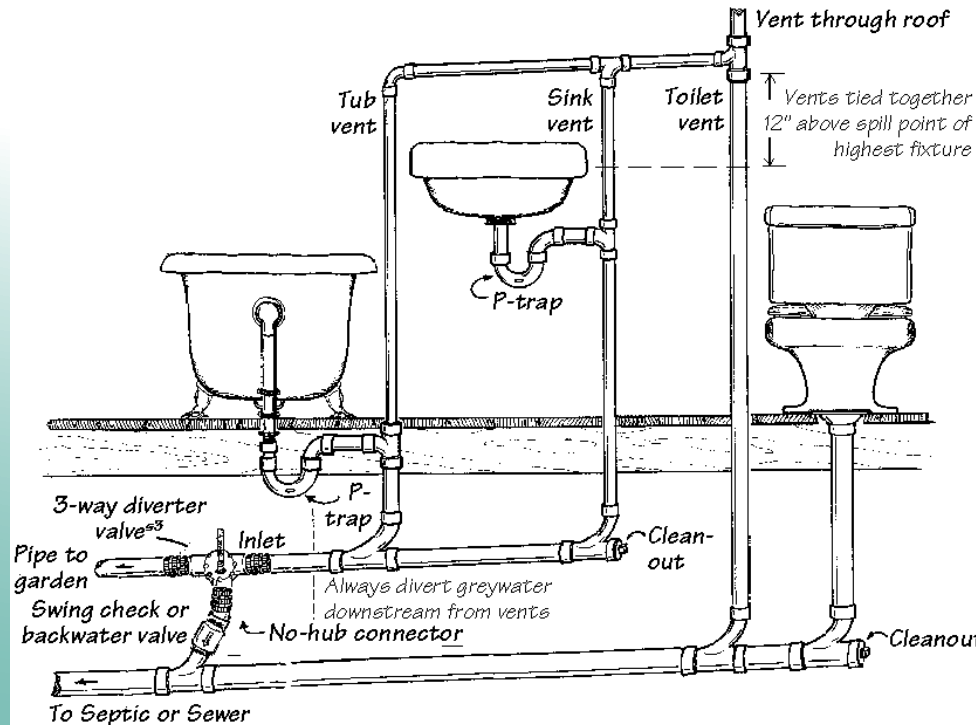
Protective of the
environment

Provide a beneficial
use/resource value

Graywater Reuse and Disposal Systems

What is a graywater reuse and disposal system?

- Any existing or proposed graywater collection and distribution system equipped with a diversion device that can direct graywater between beneficial reuse and disposal.



Graywater Reuse and Disposal Systems

How can I use graywater?

Toilet or urinal flushing

****This activity is regulated by state plumbing code, not DEQ.**

Special conditions of use:

- Graywater cannot originate from kitchen sinks
- Requires use of “off-the-shelf” and pre-designed system

Permitting:

- Local plumbing permit
- <http://www.permitsprotect.info/>





Graywater Reuse and Disposal Systems

Subsurface irrigation of:

- gardens, lawns, and landscape plants
- food crops, except root crops or crops that have edible portions that contact graywater
- vegetated roofs that do not drain to rain gardens, swales, or other structures designed to infiltrate stormwater
- compost

You need **Type 1 graywater**, which is untreated or has only passed through a physical process to remove floating and settleable solids (i.e., fats, oils, and grease). Consider the following to help you decide if you want to use Type 1 graywater.

Special conditions of use:

- Graywater system must meet setback distances in table
- Graywater cannot be stored more than 24 hrs
- The point of graywater discharge must be covered by at least 2 in. of soil, mulch, or other suitable material.
- Graywater must not surface, pond, or runoff.

Permitting:

- No documentation must be submitted to DEQ.
- Straight-forward registration process.
- Minimal fees



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Graywater Reuse and Disposal Systems

Landscape ponds not intended for human contact or surface drip irrigation

You need **Type 2 graywater**, which in addition to passing through a physical process to floating and settleable solids, has been further treated by a chemical or biological process to clean the water. Consider the following to help you decide if you want to use Type 2 graywater:

Special conditions of use:

- Graywater must meet setback distances in table
- Graywater must be treated to meet the following criteria: $BOD \leq 10 \text{ mg/L}$ and $TSS \leq 10 \text{ mg/L}$ (Type 2 graywater)
- A graywater sample must be analyzed by a laboratory one or two-times per year
- Signs must be posted at the point of reuse....
- Ponds must be lined to prevent graywater seepage into the ground

Permitting:

- Requires documentation to be reviewed and approved by DEQ
- More time consuming and expensive
- Higher initial cost and annual fees This is in an important step so we need to develop the clearest way to communicate what required for different uses of graywater.

Graywater Reuse and Disposal Systems

What are some of the basic rules for using graywater?

- Graywater originating from kitchen sinks must pass through a physical treatment process to remove settleable and floating solids
- Graywater cannot originate from dishwashers or garbage disposals
- Wastewater from the washing of soiled diapers or similarly soiled or infection materials must be directed to the sewer (or septic system)
- Graywater may not contain residual waste from cleaning of oily rags; rinsing paint brushes; disposal of pesticides, herbicides, or other chemicals; disposal of waste solutions from hobbyist activities like photo labs; and other similar types of wastes
- Do not store graywater more than 24 hours.
- The point of graywater discharge must be covered by at least 2 in. of soil, mulch, or other suitable material.
- Graywater must not surface, pond, or runoff.



Graywater Reuse and Disposal Systems

- Only use graywater where you need it
 - Know your soils
 - Know your plants and their water needs

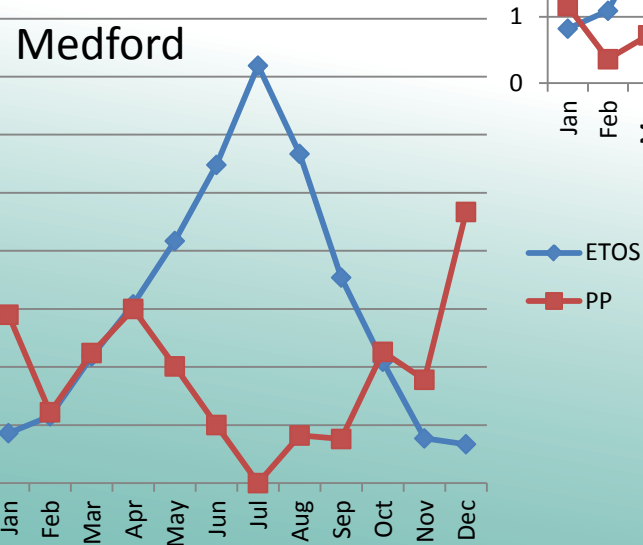
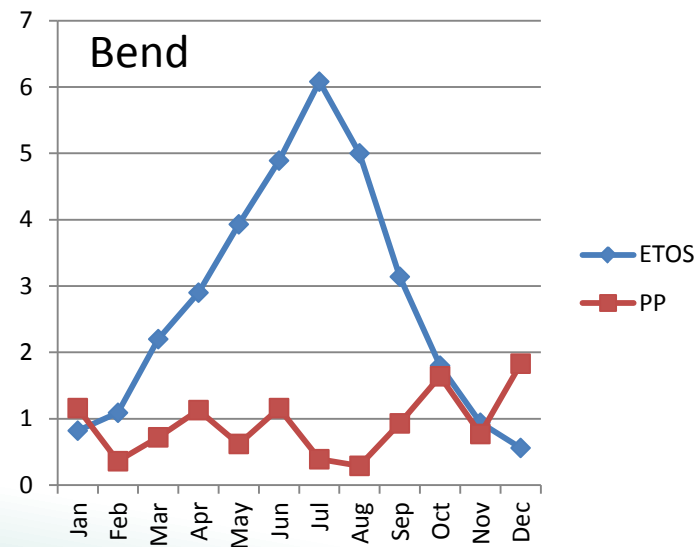
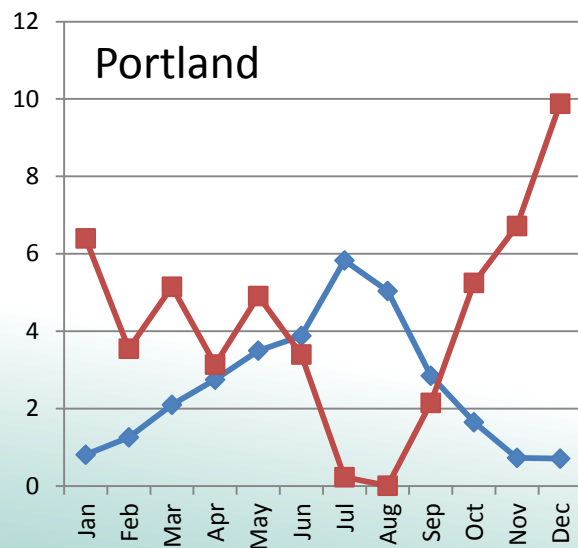




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Graywater Reuse and Disposal Systems

- Only use graywater when you need it



**Precipitation and ET for
3 Oregon locations in
2010.**

- Do not use graywater on frozen or saturated soils

Graywater Reuse and Disposal Systems

- Avoid using products that can harm soils and plants
 - Salts and sodium compounds
 - Boron or borax
 - Chlorine bleach
 - Harsh chemicals
- Do not eat plants or vegetables that have come in contact with graywater



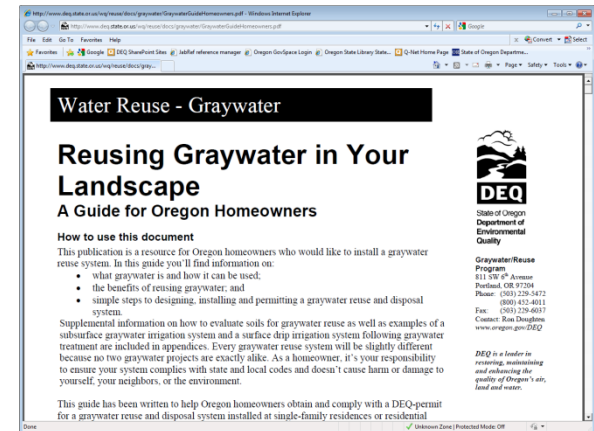


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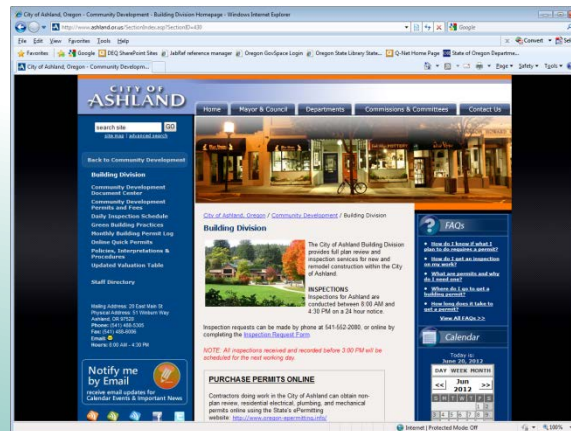
Graywater Reuse and Disposal Systems

How can I begin using graywater?

1) Design your system using the guidelines in:
Reusing Graywater in Your Landscape: A Guide for Oregon Homeowners



2) Apply for your building permits



3) Apply for a graywater reuse and disposal permit from DEQ



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Graywater Reuse and Disposal Systems

Where can I get more information?

DEQ website: <http://www.deq.state.or.us/wq/reuse/graywater.htm>

- Reusing Graywater in Your Landscape: A Guide for Oregon Homeowners
- Questions and Answers: Permits for graywater reuse and disposal systems
- Permit applications

Not all the following information can be used in Oregon

Regional Water Providers Consortium:

<http://www.conserveh2o.org/>

Agrimet (irrigation and water use):

<http://www.usbr.gov/pn/agrimet/h2ouse.html>

Washington Graywater program:

<http://www.doh.wa.gov/ehp/ts/ww/greywater/greywater.htm>

San Francisco Graywater Guide:

<http://sfwater.org/modules/showdocument.aspx?documentid=55>

Greywater Action: <http://greywateraction.org/>

Oasis Design: <http://oasisdesign.net/>

Graywater Gardening: <http://www.graywatergardening.com/>





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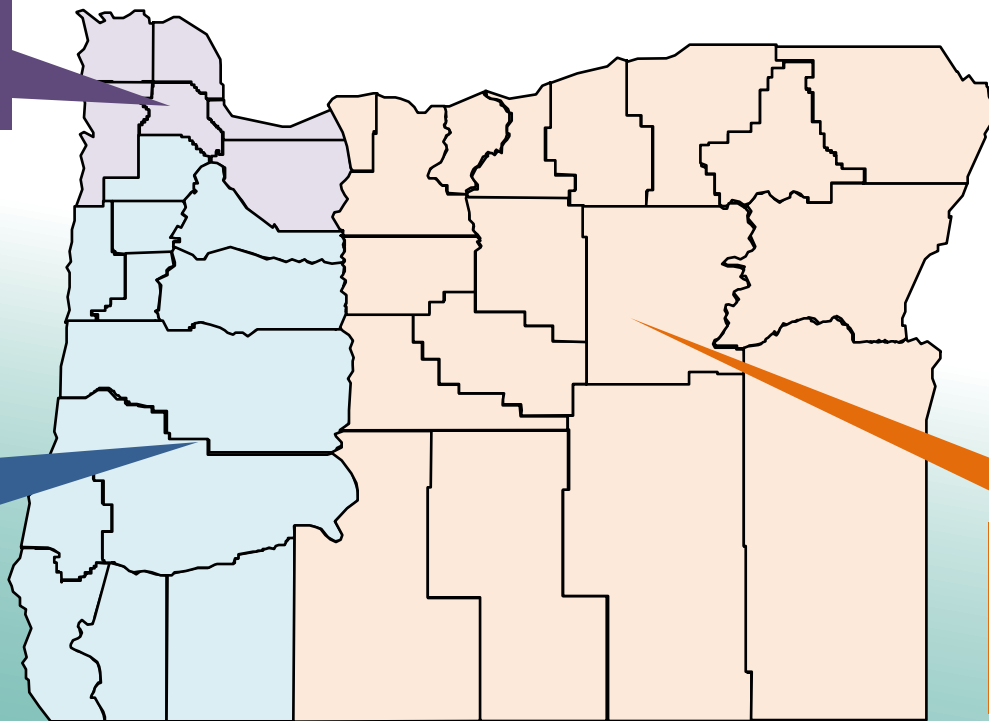
Graywater Reuse and Disposal Systems

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