Getting Your Graywater Permit

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Graywater Reuse and Disposal Systems

Why are you here?
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Overview

– Background information
– Before you get started
– 9 steps to a DEQ graywater permit
– Resources & questions

Watch for keys to compliance!
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Graywater in Oregon

Early history

Rulemaking

Rule Implementation

Graywater Reuse Program

Graywater disposal and DEQ onsite
- Split waste
- Sumps

Graywater reuse
- Urban task force
- Plumbing code & toilet flushing

June ‘09
Governor signs HB2080

Aug. ‘11
Rules adopted by EQC

Apr. ‘12
Accept permit applications

Tasks
- Issue permits
- Outreach
- Training
- Permit development
- System updates

- Permit development
- Program administration
- Agency coordination
- Information resources

Public comment
Public hearings
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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]
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Why use graywater?

Changing climate

Increasing demand

Conflicting uses

Allocated streams
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Save treatment costs at WWTP

Water quality improvement

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

- Reduce your water use
- Reuse your graywater
- Recycle excess water to the sewer or septic system
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What’s in graywater?
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- 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.
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- Graywater will contain whatever you put down the drain
- It’s not toilet water, but it’s not drinking water either!

<table>
<thead>
<tr>
<th>Showers &amp; baths</th>
<th>Bathroom sinks</th>
<th>Laundry</th>
<th>Kitchen sinks</th>
</tr>
</thead>
</table>
| • Relatively clean  
• Predictable volume and frequency | • Higher concentrations of hair, toothpaste, shaving cream, etc.  
• Low volume | • 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 | • No dishwashers or garbage disposals  
• “Dirtiest” source of graywater  
• May contain fats, oils, grease, and solids  
• May contain bacteria, viruses, and other microorganisms  
• Requires special plumbing for use |
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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.)
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
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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Before you get started

State regulations *encourage* the reuse of graywater for *beneficial purposes* such as irrigation

Oregon’s graywater program is a beneficial reuse program—not a disposal program

Oregon statute requires a person to obtain a permit from DEQ to construct, install or operate a graywater reuse and disposal system

Obtaining a permit requires *thoughtfulness* and *planning*
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# Step 1: Determine use

## Uses of graywater include:

<table>
<thead>
<tr>
<th>Type 1 graywater</th>
<th>Type 2 graywater</th>
<th>Type 3 graywater</th>
</tr>
</thead>
</table>
| - **Subsurface irrigation of:**  
  - gardens, lawns, and landscape plants  
  - food crops, except root crops or crops that have edible portions that contact graywater  
  - green roofs  
  - compost  
  - Subsurface = 2” cover of soil, mulch or compost  
  - Graywater must be used within 24 hours  
  - Graywater must not surface, pond, or runoff. | - Any Type 1 use  
  - Landscape ponds not intended for human contact  
  - Surface drip irrigation of gardens, lawns, living walls, greenhouses, and landscape plants. | - Any Type 2 use  
  - Sprinkler irrigation of gardens, lawns, living walls, greenhouses, and landscape plants  
  - Wash water for mechanical cleaning of equipment, cars, sidewalks, and streets  
  - Industrial, commercial, or construction uses limited to industrial cooling, rock crushing, aggregate washing, mixing concrete, and dust control |

- Any Type 3 use

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Note: For a complete list of uses and disposal methods, please refer to the official guidelines and regulations provided by the State of Oregon Department of Environmental Quality (DEQ).
Step 2: Pick a location

Only use graywater _where_ you need it

- Know your soils
- Know your plants and their water needs
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Only use graywater where it won’t have negative environmental consequences

- Irrigation sites must not flood or receive large amount of runoff at the time of irrigation
- Slope must be less than 45 degrees
- During the irrigation season, must be at least 4-feet of vertical separation below the point of graywater release and groundwater
- Observe horizontal setback distances

  100’ to groundwater wells and springs
  50’ to surface water bodies
  10’ to stormwater structures
  2’ to property lines
Keep a written record of your site evaluation!
Create a site diagram or map with the following information:
- Total size of your property
- Area and location of graywater irrigation
- Location of “sensitive features” including surface water, wells, property lines

Know your soil
- Sand, silt, clay, loam, etc.

Describe vegetation
- High, medium, or low water usage

Lot size: 7500 sq. ft.
Zone 1: 625 sq. ft.
  - veggie garden
  - med. water
  - Loamy soils, well-drained

Zone 2: 875 sq. ft.
  - native plants
  - low water

Shallow groundwater
Heavy clay soils
25% slope
W. 10th St.
Step 3: Estimate your summer irrigation needs

- **Method A:** Water bill calculation

  \[
  \text{Weekly irrigation (gal/wk)} = \frac{\text{Summer water use} - \text{Winter water use} \times 748 \times 7}{\text{Days of services for water bill}}
  \]

- **Method B:** Area and vegetation calculation

  \[
  \text{Weekly irrigation (gal/wk)} = A \times ET_{\text{lawn}} \times k_s \times 0.62
  \]

As a rule of thumb, lawns require 1” of water per week during July and August.

You need provide the estimate on the permit application.
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Step 4: Estimate your available graywater
Consider the sources of graywater you can “harvest”

- **Showers & baths**
  - Relatively clean
  - Predictable volume and frequency

- **Bathroom sinks**
  - High conc. of personal care products
  - Low volume

- **Laundries**
  - Predictable volume and frequency
  - High conc. of lint/fiber
  - Detergents can be hard on plants

- **Kitchen sinks**
  - “Dirtiest” source
  - May contain high conc. of organics, solids, fats, oils, grease, bacteria
  - Required physical treatment
Estimating graywater flow:

Graywater flow (gal/wk) = Flow per event × events per week

Example: Each person in a 3-person household showers 5 minutes every day.
The showerhead is rated at 2.2 gallons/minute.

Shower flow (gal/wk) = 2.2 gal/min × 5 min/day × 7 days/wk × 3

= 231 gal/wk

You need provide the graywater flow estimate on the permit application
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Create a water balance:

<table>
<thead>
<tr>
<th></th>
<th>Example A</th>
<th>Example B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graywater supply</td>
<td>274 gal/wk</td>
<td>410 gal/wk</td>
</tr>
<tr>
<td>Water need (subtract)</td>
<td>100 gal/wk</td>
<td>569 gal/wk</td>
</tr>
<tr>
<td>Difference</td>
<td>164 gal/wk <strong>surplus</strong></td>
<td>-159 gal/wk <strong>deficit</strong></td>
</tr>
<tr>
<td>Design option</td>
<td>Reduce number of fixtures</td>
<td>Plan for supplemental irrigation</td>
</tr>
</tbody>
</table>

“Raw” graywater cannot be held for more than 24 hours.

*If you’d like to store excess graywater, your system design must include graywater treatment and storage, which requires a different DEQ permit (Tier 2, 2402 general permit).*
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Step 5: Design your graywater system

Use your site specific data to **design** your graywater system

- Graywater **collection system** and plumbing
- **Diversion device**
- Physical **treatment** for kitchen sinks
- **Surge tanks**
- **Distribution** system
- **Irrigation** system
- Make the design clear and simple
- If necessary, use a professional to help
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Step 6: Document your system

System design plan
- Beneficial uses
- Location
- Design flow
- Fixtures
- Treatment
- Distribution and irrigation
- Name and contact information for designer

Note: You do not have to submit your system design plan to DEQ (Tier 1 permit only).
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Operation & maintenance manual
- A short “how-to” guide for your graywater system
- Routine maintenance (e.g., cleaning filters)
- Periodic maintenance (e.g., seasonal flushing)
- Turning the system on in the spring
- Shutting down the system in the fall
- Draining the irrigation system
- Operation of the diversion device

Note: You do not have to submit your O&M manual to DEQ (Tier 1 permit only).
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Step 7: Apply for your permits

- **Plumbing permits:** contact your local building department for plumbing requirements
  - You need to list plumbing permits on your DEQ permit application

- **DEQ permit** (Tier 1 2401 general permit):
  - Pay the fees: $90 ($50 application fee; $40 annual compliance fee)
  - Send in the application
  - Wait to receive notification (via email or postal mail) of coverage
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Tier 1 (2401) general permit

Send completed application and permit fees to:
Oregon DEQ
Attn: Business Office
811 SW Sixth Avenue,
Portland OR 97204

http://www.deq.state.or.us/wq/wqpermit/docs/general/wpcf2401/2401 PermitApp.pdf
Step 8: Install your system

Photos from San Francisco Graywater Design Manual for Outdoor Irrigation
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Step 9: Operate & maintain

Only use graywater when you need it:
1. If the plants need water, give them graywater
2. If graywater isn’t enough, give them some fresh water
3. If the plants don’t need water, send your graywater to the sewer or septic system

- [http://www.conserveh2o.org/outdoors/irrigation/weeklywateringnumber](http://www.conserveh2o.org/outdoors/irrigation/weeklywateringnumber)
- Do not irrigate when soils are frozen or saturated
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- 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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- Visually check your system, look for leaks, breaks, or other problems
- Clean or change filters; remove solids, grease, etc. from the physical filtration system
- Check out mulch basins and irrigation areas and make sure that graywater isn’t surfacing or running off
- Maintain mulch over graywater discharge points
- Check to verify that graywater discharge points aren’t clogged or restricted
- If needed, flush the system or otherwise clean the system

Submit an **annual report** to DEQ

Renew your permit!
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Resources & Questions

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
Greywater Action: http://greywateraction.org/
Oasis Design: http://oasisdesign.net/
Graywater Gardening: http://www.graywatergardening.com/