Residential Graywater: Background on Public Health and Environmental Issues

A Presentation for Maryland’s Graywater Advisory Committee

September 18, 2019
Presentation Overview

• Managing Public Health Risks
• Managing Environmental Damage Risks
• Preventing Nuisance Issues
• Protecting Graywater Systems
• Treatment & Water Quality
Reduce Health Risks

• Graywater can contain bacteria & viruses
• Stored graywater can grow bacteria
• Graywater can contain chemicals

• Prevent Human Contact with Graywater
  1. Use subsurface drip systems for outdoor irrigation
  2. Avoid Ponding Water
  3. Keep graywater on the property where it was generated
  4. Do not irrigate food crops
  5. Ensure Proper Plumbing, E.g.,
     • Prevent uncontrolled over-flows via proper plumbing
     • Prevent cross-connection with potable water
Reduce Health Risks

Subsurface Lawn Drip Irrigation

Drip Irrigation Under Mulch
Reduce Health Risks

Avoid Ponding Water

Avoid Water Leaving the Property
Reduce Health Risks

Prevent Over-flows:

[Diagram of gray water system with labels for filter system, gray water reservoir, vent, overflow, check valve, and indirect discharge to sanitary drainage system and irrigation zones.]
Reduce Health Risks

Prevent cross-connections with potable water supplies

Typical Toilet Back-Flow Prevention

- Potable Water
- On/Off Valve
- Refill Water
- Flush Water
- Anti-siphon Fill valve
- Air Gap
- Water Level
Reduce Health Risks
Prevent cross-connections with potable water supplies

Aqus System, Sloan Valve Co.
Reduce Health Risks

Prevent Cross Connections with Potable Water Supplies

Graywater Toilet Back-Flow Prevention

Potable Water

On/Off Valve

Refill Water

Anti-siphon Fill valve

Air Gap

Flush Water

Water Level

Graywater

On/Off Valve
Reduce Environmental Risks

- Graywater can Contain Chemicals
- Stored Graywater can Undergo Chemical Transformations

Protect Soil Health

Protect Plant Health
Reduce Environmental Risks

Protect Surface Water

Protect Groundwater
Protect the Graywater System

• Prevent Untimely Maintenance Problems

Avoid Subsurface Drip System Clogging
Storage, Treatment and Water Quality

• Coarse Screening, e.g., Lint.

• Treatment is necessary for storage of more than 24-hours (maintain the oxygen to avoid fetid water)

• Additional treatment is typically required for use in toilet flushing. Typical Quality Parameters:
  • 5-day biological oxygen demand (BOD)
  • Total suspended solids
  • Total coliforms
Building Maryland’s Water Reuse Future
Choose the PURPLE PIPE

• Check out MDE’s Reuse Website & Share the Link http://bit.ly/H20reuseMDE

• Talk to colleagues about water reuse

• Consider water reuse as a tool & possible way to reduce or even avoid permit burdens.

Remember, it’s all ONE water!
Thank You

Questions? Comments?