DO THE POLL!

Residential Greywater Basics

Alicia Murphy:
The Water Song
2:28

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- Certified Level 2 Greywater Designer and Installer with **Greywater Action**
- **QWEL Greywater Training** (Qualified Water Efficient Landscaper) USEPA WaterSense approved training
- American Rainwater Capture Systems Association (**ARCSA**)-trained
- **Water Wise Davis** member
- **EcoAssistant** service provider

Water Wise Davis

- Advocates for wise use of water resources in Davis
- Crafting language and advising local officials on greywater ordinance
- Looking for participation, support, and input (email lesliecrenna@gmail.com)
- Cool Davis working group

Overview

- Site-based water management
- What's, why's
- Two basic system types
- Design considerations and costs
- Example systems
- Wrap up

Woodland Daily Democrat

July 29 2021

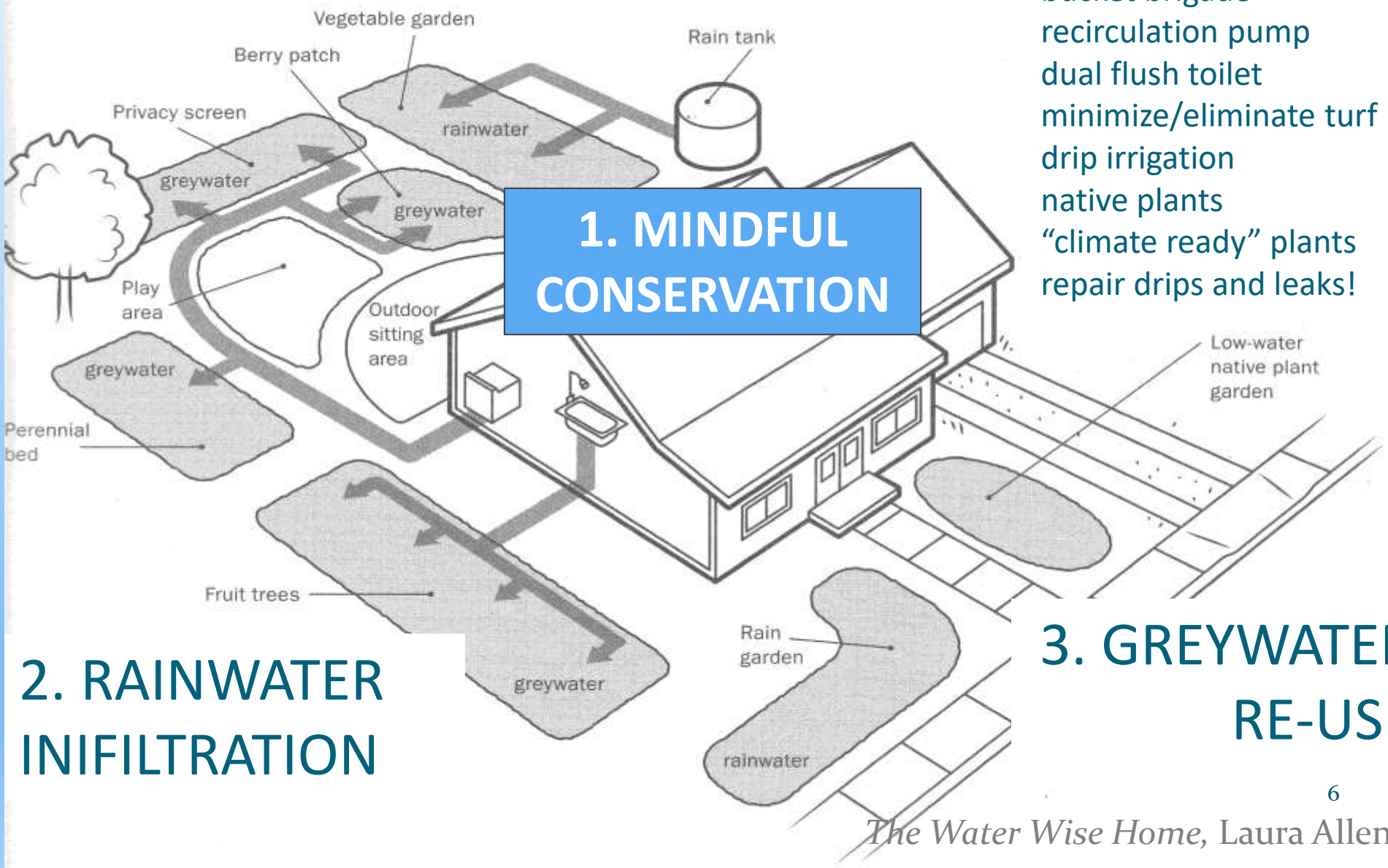
Yolo County proclaims local drought emergency

A local drought emergency has been proclaimed in Yolo County after one-fifth of the county's wells reached an all-time low.

Read more →

Site-Based Management

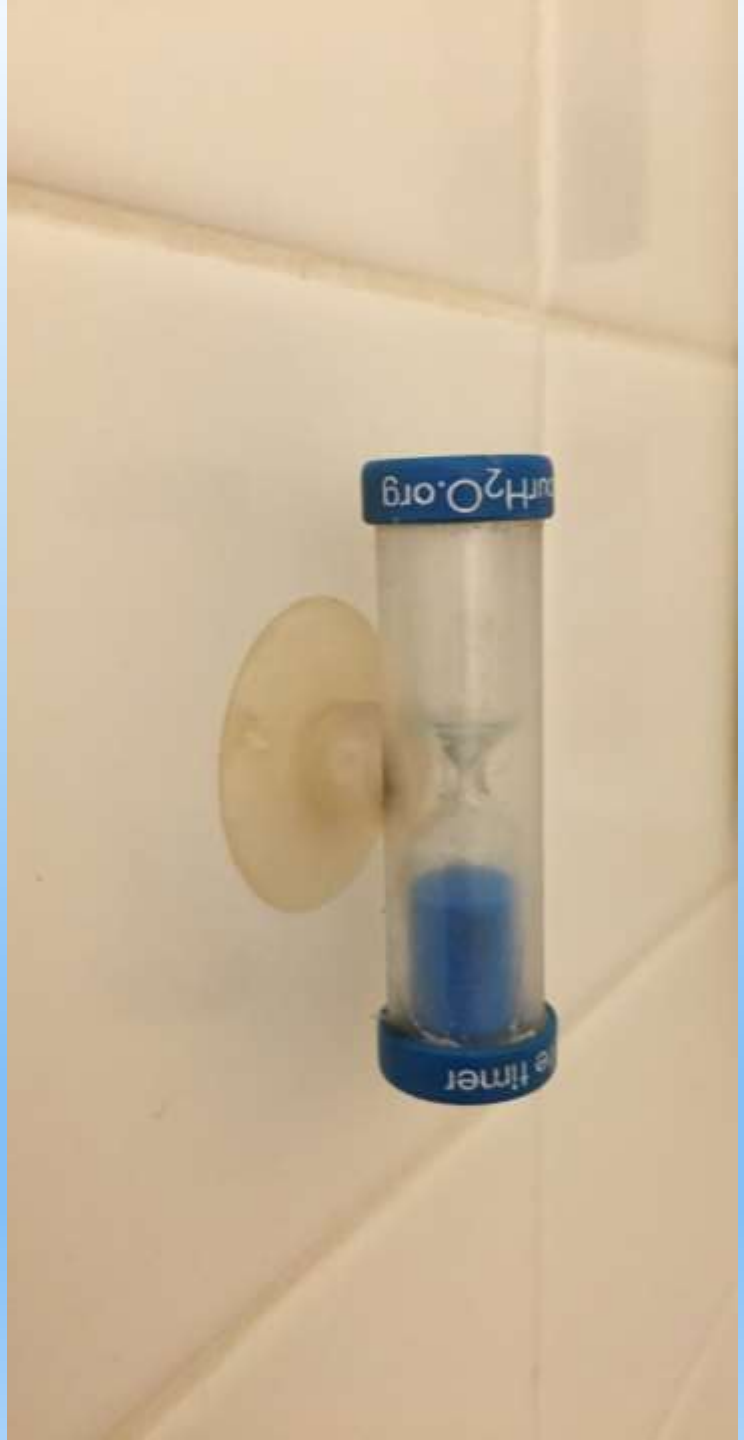
low flow showerhead
shower timer
bucket brigade
recirculation pump
dual flush toilet
minimize/eliminate turf
drip irrigation
native plants
"climate ready" plants
repair drips and leaks!



2. RAINWATER INIFILTRATION

3. GREYWATER RE-USE

The Water Wise Home, Laura Allen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What Is Greywater?

Per California code, greywater is drainage water from . . .

- Clothes washers (laundry)
- Showers and tubs
- Bathroom sinks (“lavatories”)

Why Greywater?

- Saves or offsets potable water use
- Improves awareness/engages us
- Combats drought
- Saves some money
- *Healthier shade trees*
- *Increases yield for food producing trees*
- Improves groundwater recharge
- Reduces embodied energy consumption

Consider the Landscape First

Great for many …

- Fruit trees and berries
- Shade trees, thirsty shrubs
- Some veggies ok
- Generally not for lawns

Two Basic System Types

Laundry to Landscape (L2L)

Uses washer pump to move greywater

Branched Drain (BD)

Uses gravity to drain greywater
("shower/tub system")

Standard BASIC Features

- Outdoor irrigation
- No storage
- 3-way valve
- Salts, bleach, oils, and toxics to sewer
- Discharge below grade

CA State Code Requirements

- No cross connections with potable
- No ponding or runoff
- No storage greater than 24 hours
- No root crops or those with soil contact
- Valve readily accessible
- No treatment needed if discharged subsurface

2019

Higher Tech Systems

- Pumps
- Filters
- Wetlands
- Pressure
- Districts

Indoor reuse (for toilet flushing)

1. Laundry to Landscape (L2L)

- No permit required
- Diverts washer water to landscape
  (about 20-100 gallons/week/person depending)
- Requires greywater friendly soap
- Costs $800 to $1200 ($300-400 DIY)

L2L Design Considerations

Interior

Access to exterior

Type of washer and gallons per load

Loads per week

Peak flows laundry schedule

Exterior

Landscape features concrete walkways

Slope away from house

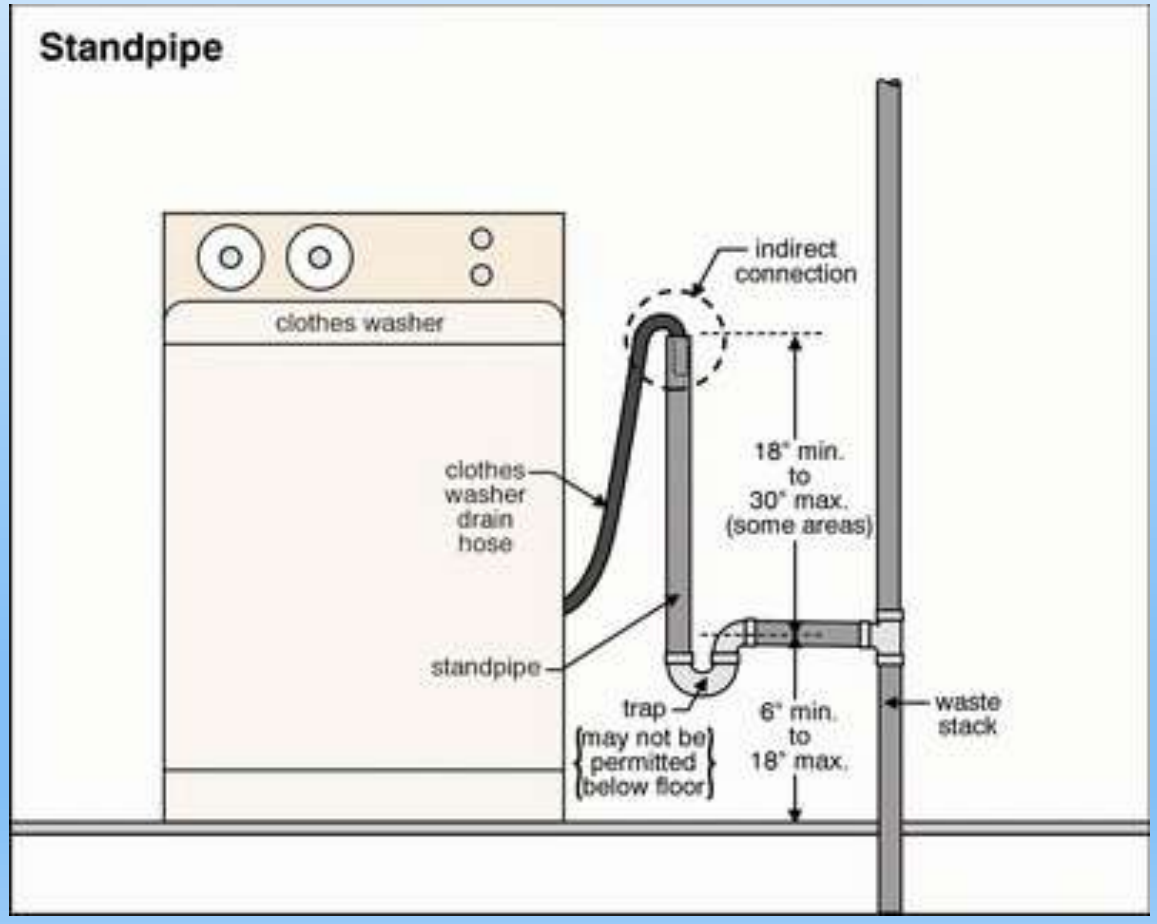
Water needs and mulch basin site WUCOLS

Infiltration rate/soil type jar test

Distance from washer ~75ft max

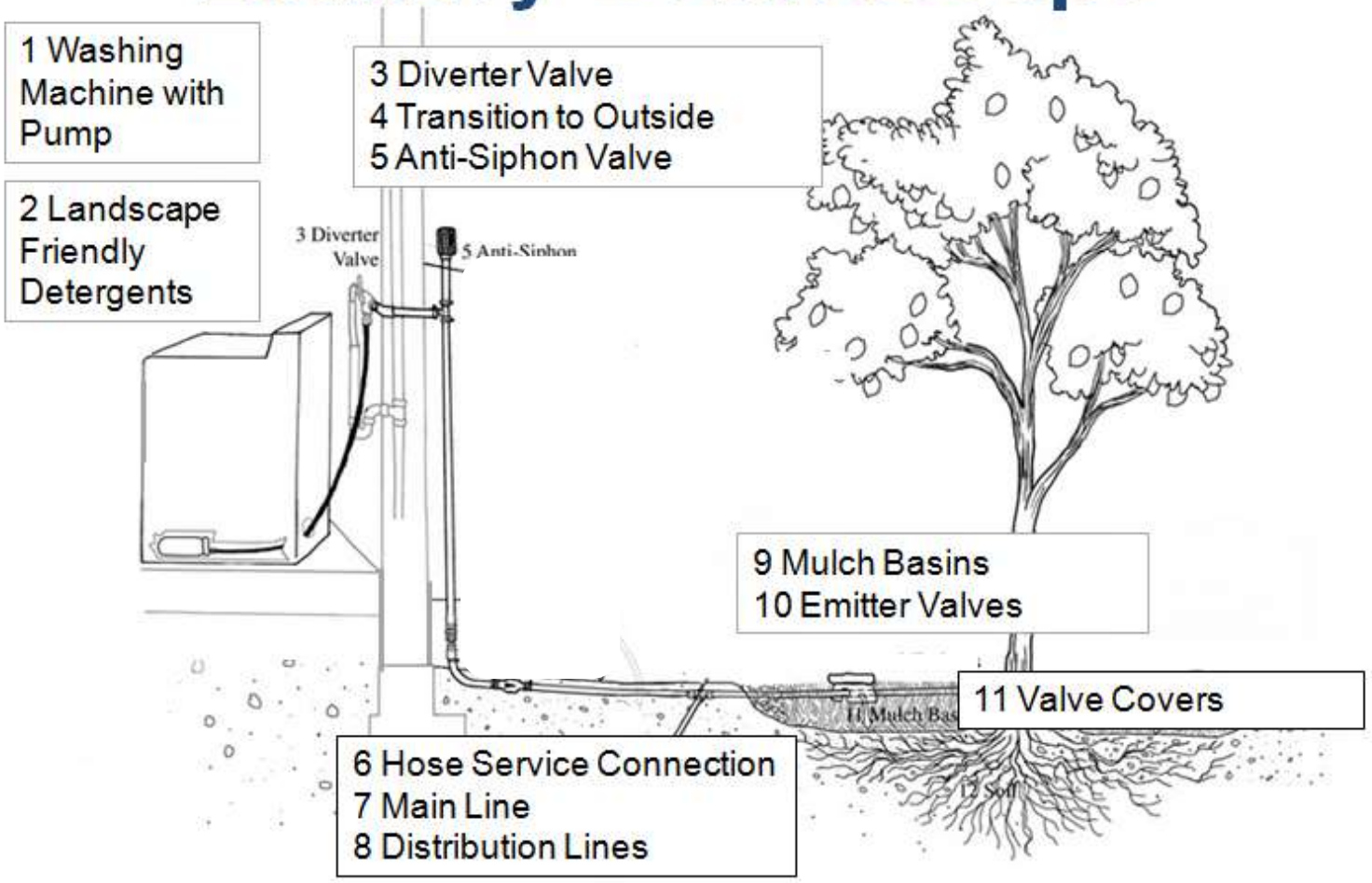
L2L

Typical Washer Drainage



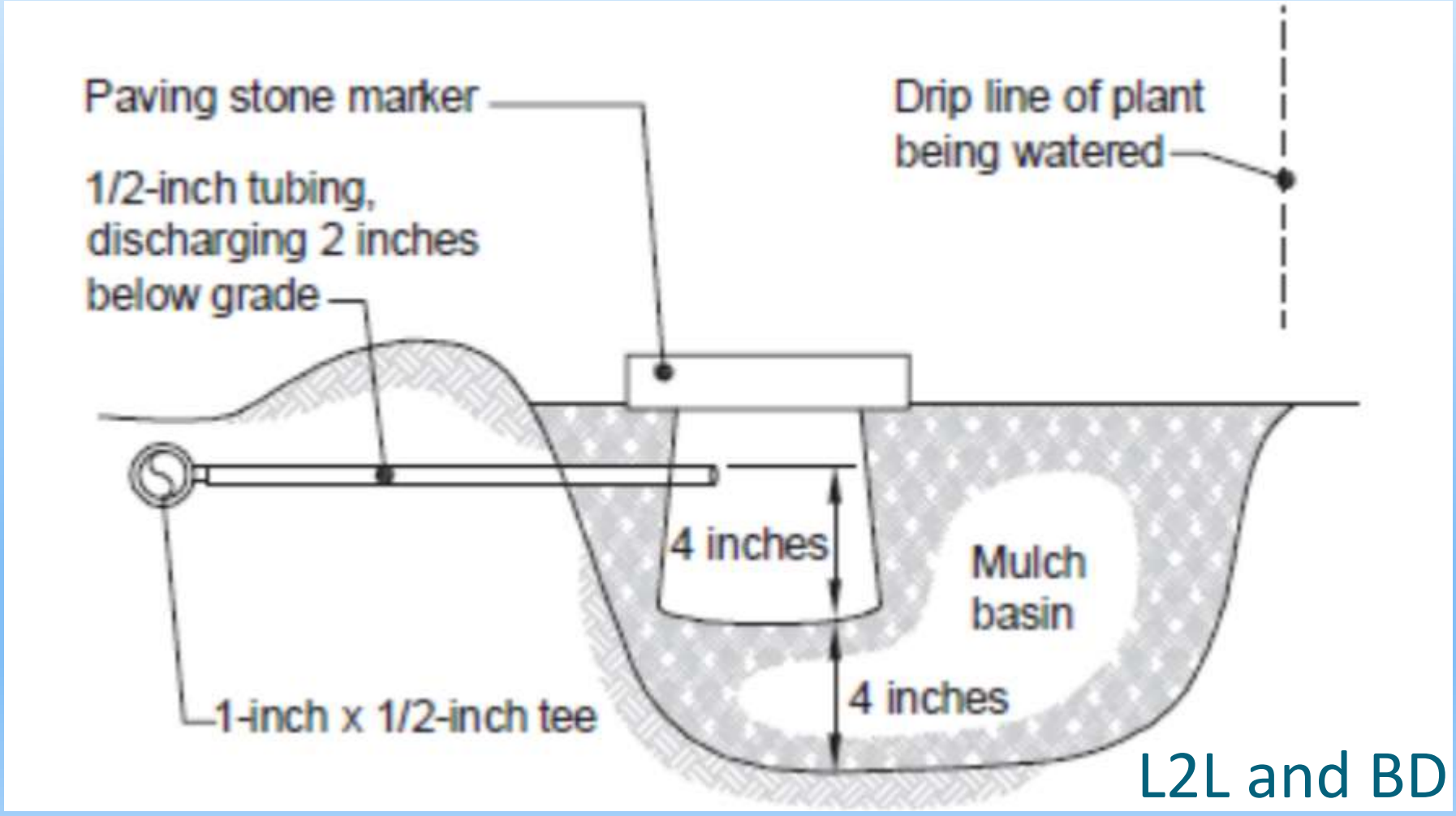
L2L

Laundry 2 Landscape

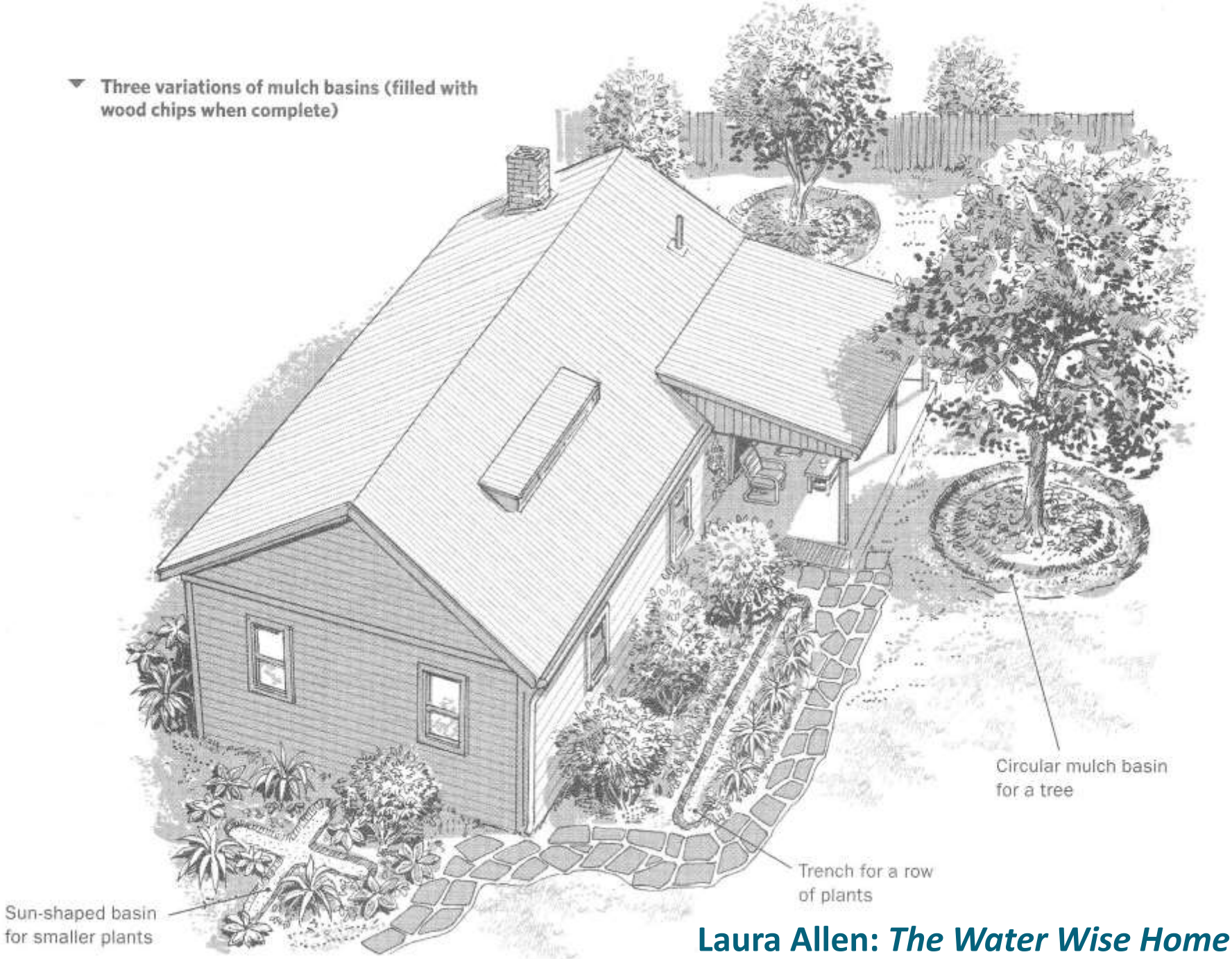


Based on diagram from Art Ludwig: *Creating an Oasis with Greywater*

Mulch Basins from City of Davis Guidance



L2L and BD



Laura Allen: *The Water Wise Home*

L2L

Greywater Friendly Detergents

No sodium, boron, bleach

Liquids with balanced pH

Laundry Systems

L2L

3-way valve and air gap (AAV)

L2L

Air gap on exterior

L2L

Remodel installation

L2L

Transition to exterior with hose cleanout

L2L

Barriers may call for trenching

L2L

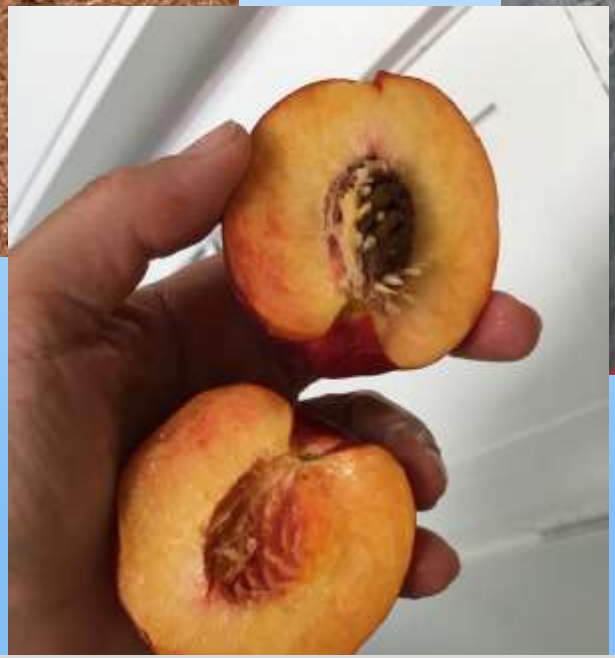
Main distribution line branches to mulch basins

L2L

Distribution lines feed into covers that rest in mulch basins filled with chips

Perforated tubing can be buried under mulch layer

L2L



YEAR 1

“Flavortop” nectarine w Lovell peach rootstock

2. Branched Drain (BD) Greywater

- Diverts water from showers and bathroom sinks to landscape
- Gravity-based/challenging with slab
- Greywater friendly shampoos, body soaps, cleansers
- More water but also complexity, cost
- Costs about $1500 to $5000 and up
- Requires permit ($72 min in Davis)

Design Considerations for BD

Interior

Crawl space v. slab

Remodeling plans

Showerhead gallons per minute

Number of showers per week

Length of showers

Exterior

Slope is critical, must maintain elevation

Will need to trench

Higher water production

Landscape Friendly Hygiene

- No sodium (sodium lauryl/laureth sulfides)
- Neutral pH, bar soaps are alkaline
- Skin Deep database

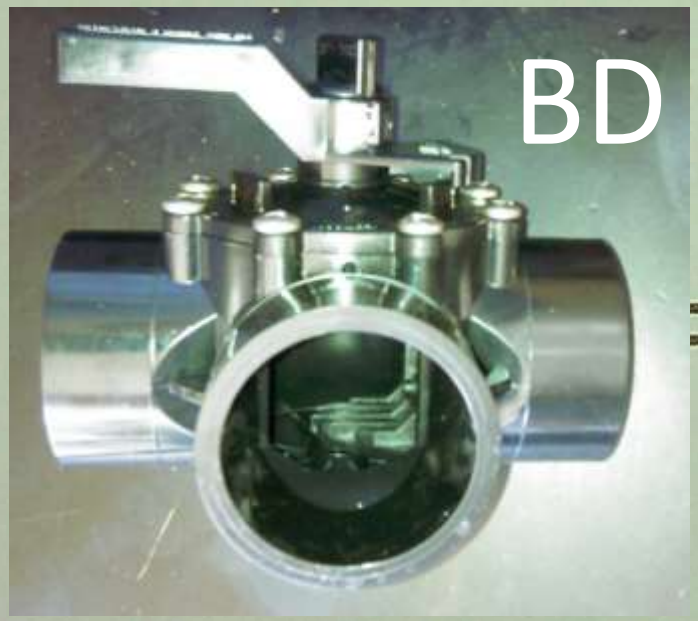
BD

Cleaning Your Tub or Shower

Either send the cleaners to the sewer or use:

- Vinegar
- Landscape friendly liquids
- Other ideas?

Branched Drain Interior



Inlet

3-way valve

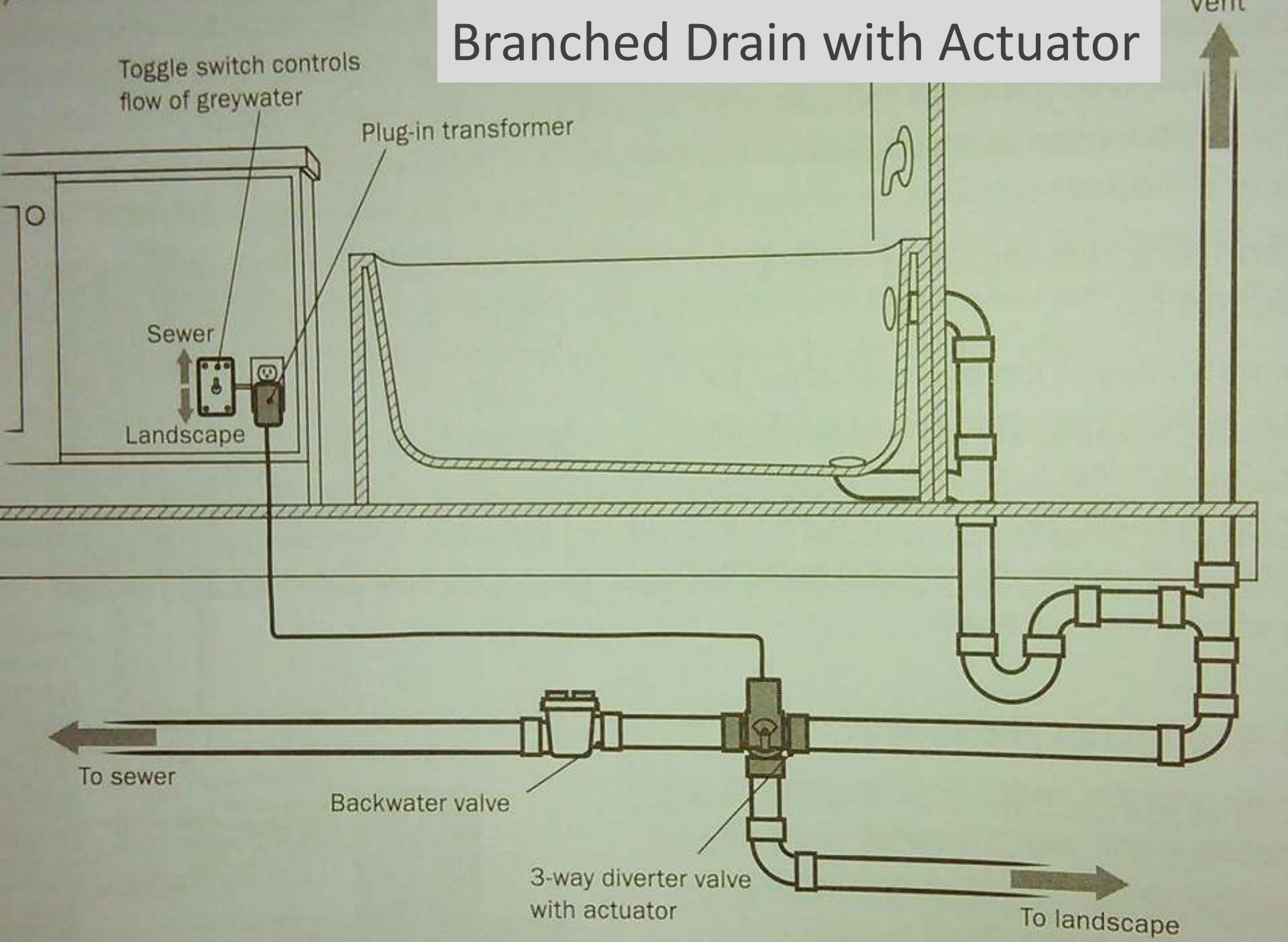
To greywater

To sewer

Backwater valve

Laura Allen: ***The Water Wise Home***

Branched Drain with Actuator



▲ **Actuator installed**

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Branched Drain System

BEFORE: receiving landscape

First Story Slab Addition (Repour)

HAYWARD
GOLDLINE
GVA-24
Valve Actuator
CAUTION: TURN OFF POWER TO THE ACTUATOR BEFORE
REMOVING THE COVER FOR SERVICE
This unit must be supplied by a UL Listed Class II Transformer
For indoor/outdoor use. Duty Cycle - 24 cycles per hour
www.haywardnet.com or call 1-888-HAYWARD
Power: 24VAC, 60Hz, .6A

BD

Turns the corner before entering landscape

BD

Open single shared mulch basin

Open trenches

Bell trap

Plant Water Needs

- Must consider species, water needs, rootstock, soil type
- Avoid acid loving species such as blueberries, gardenias, camelias, azaleas, madrone
- Laundry systems good for many plants because weekly watering is common need
- Shower systems, require careful design to meet watering needs, great for water loving species
- The water cools down quickly!

Shower Systems = “Wet Feet”

Good for plants that prefer or tolerate daily water

- Redwood
- Bamboo
- Vines such as berries, kiwi
- Apples, figs, pears, persimmons
- Stone fruits (peach, nectarine, plums) (variable depending on rootstock and other conditions)
- Avoid citrus

Native Trees

Shower greywater is appropriate for riparian natives (damp soil) including …

- Box Elder
- Big Leaf Maple
- Fremont Cottonwood
- Red Willow
- Western Sycamore
- Creek Dogwood and Elderberry (shrubs)

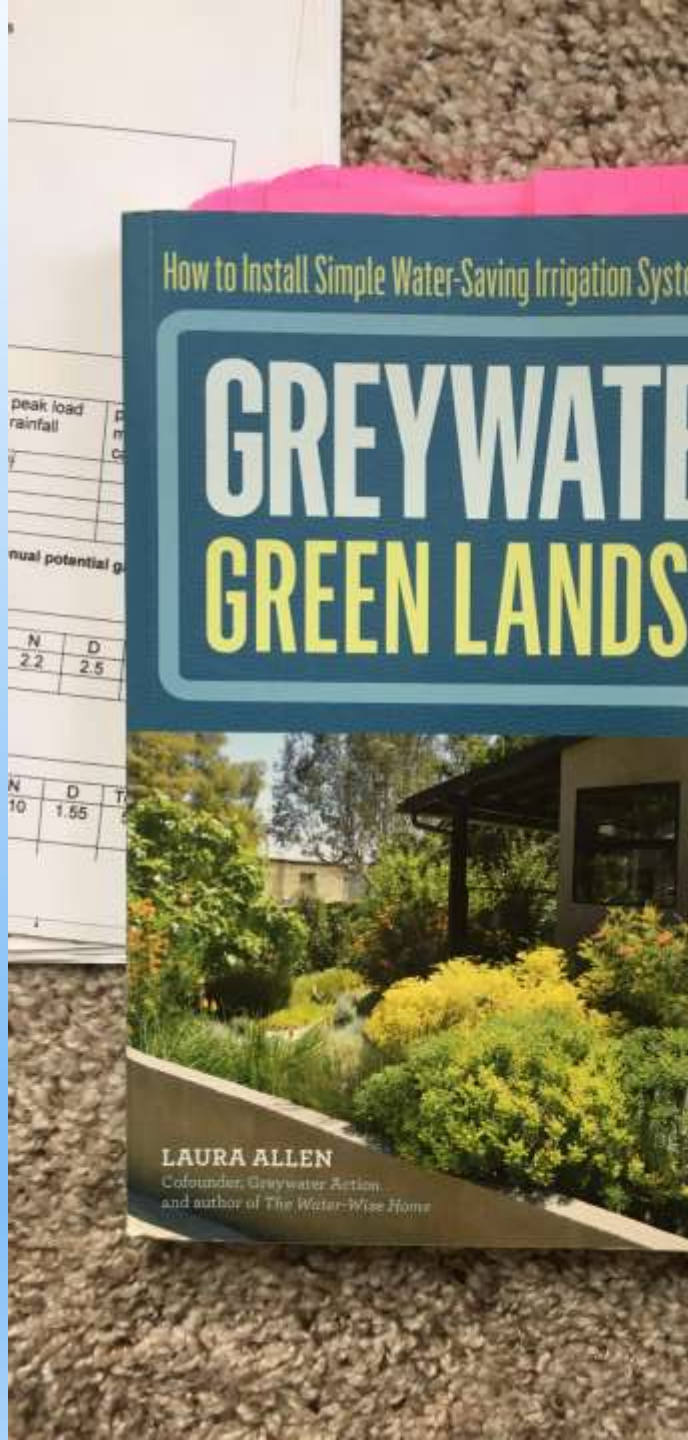
Visit www.calscape.org for native plant water requirements

One Piece of the Puzzle

- Manual or pressure irrigation is often needed
- Greywater irrigation systems fill in gaps, allow pressure zone to be turned off
- Drought tolerant (“low” water need) plants best irrigated by drip

DO-IT-YOURSELF?

Greywater Green Landscape
by Laura Allen



Is Greywater Right for You?

- Suitable receiving landscape?
- Plumbing accessible?
- Are appliances and fixtures near exterior walls and landscape?
- Costs within budget?

Final Wrap Up

- Landscape needs dictate system design
- Best for trees and larger landscape features
- Laundry to landscape easiest and cheapest (No permit)
- Branched drain more complex and expensive, also more water produced (Permit required)
- Sometimes not feasible (slab requires commitment/creativity)
- Remodeling? Incorporate greywater into planning

QUESTIONS?

- Site assessments
- Design
- Workshops

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Mulch Basin Siting

- In general, the dripline is directly below outer edge of the canopy; roots can extend another 50% from there
- Site basins minimum 2 feet from crown, ideally at the dripline for mature trees
- For new tree plantings at risk of drying out, basins can be sited at 2 feet from trunk to prioritize survival (possibly moved when tree matures)
- For new trees likely to receive care, basins can be sited at mature dripline with manual watering for first couple of years