

Grey(gray)water Harvesting Educational Workshop -- Tucson Water's Incentive Program



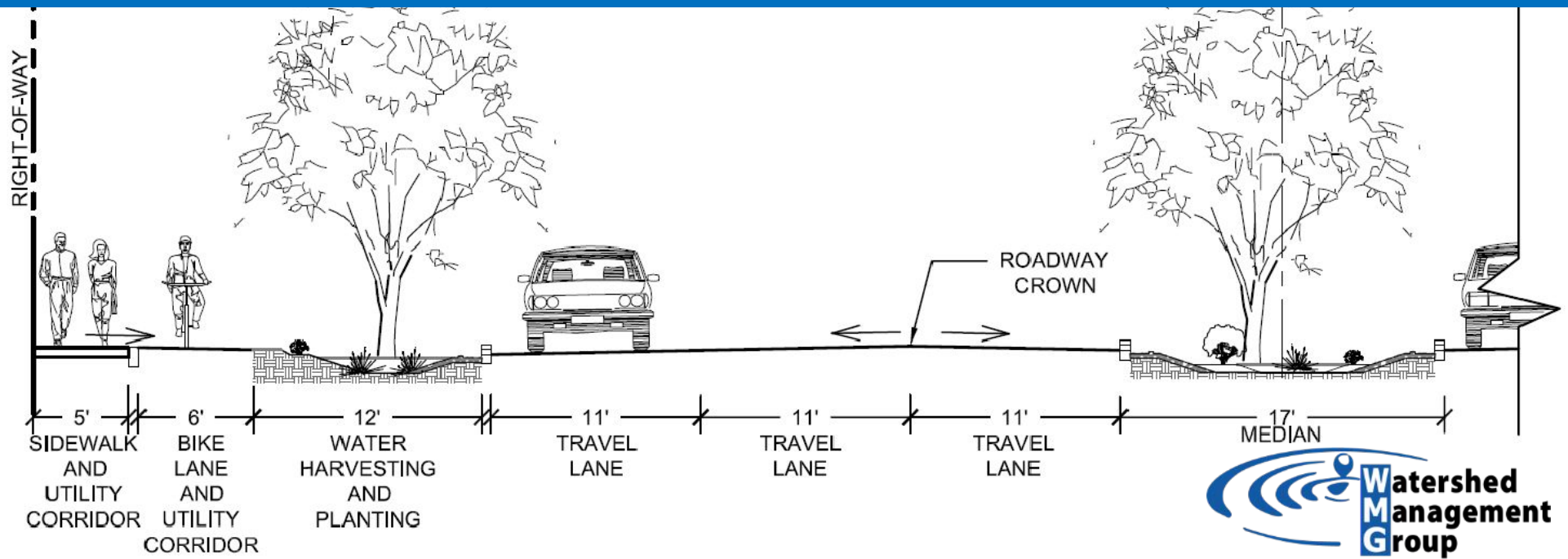
Welcome to an online class:

- ▶ We take attendance and follow up with additional resource for all class attendees. Our moderator will contact you if we need additional information.
- ▶ During the session please use the chat window if you have a question.
- ▶ At the end of the session we will have a Q&A. You will be able to use your webcam and mic if desired or just use your chat box.





Watershed Management Group develops and implements community-based solutions to ensure the long-term **prosperity of people** and **health of the environment**. We provide people with the knowledge, skills, and resources for sustainable livelihoods.



Class Overview

- Greywater rebate application
- Greywater, your water budget & plant demand
- Living Lab Tour - Greywater Sources!
- Best Practices

Tucson Water

Pay Your Utility Bill

Customer Service

Manage Your Service

Apply for Water

Conservation Rebates

Residential Rebates

High-Efficiency Toilet
(HET) Rebate

Low-Income, High-
Efficiency Toilet (HET)
Rebate

Clothes Washer Rebate

Gray Water Rebate

Rainwater Harvesting
Rebate

> Rainwater Harvesting
Grant / Loan Program

Commercial and
Multifamily Rebates

Apply for Reclaimed Water
Service

About Your Water
Quality

Contractors,
Developers, and
Engineers

Rates and Monthly
Charges

Technical Library

Public Policy

Education and Outreach

Community Relations

Rainwater Harvesting Grant / Loan Program

Tucson Water, SERI (Sonora Environmental Research, Inc.) [🔗](#), and Watershed Management Group [🔗](#) offer a grant / loan program for eligible families to help provide them with the opportunity for rainwater harvesting, which is the capture, diversion, and storage of rainwater for plant irrigation.



- Grants of up to \$400 are available to families who have a household income less than or equal to 50% of the area median income.
- Loans of up to \$2,000 are available to families who have a household income less than or equal to 80% of the area median income.

SERI and Watershed Management Group have partnered with Tucson Water to modify the rainwater harvesting rebate program so that limited-income families can participate.

- Contact SERI at 520-321-9488 or seri@seriaz.org to apply and learn about these [free workshops](#) [🔗](#).
- Contact Watershed Management Group at 520-396-3266 or co-op@watershedmg.org to apply and learn about these [free workshops](#) [🔗](#).

Tucson Water

[Pay Your Utility Bill](#)[Customer Service](#)[Manage Your Service](#)[Apply for Water](#)[Conservation Rebates](#)[Residential Rebates](#)[Commercial and](#)[Multifamily Rebates](#)[Apply for Reclaimed Water Service](#)[About Your Water Quality](#)[Contractors, Developers, and Engineers](#)[Rates and Monthly Charges](#)[Technical Library](#)[Public Policy](#)[Education and Outreach](#)[Community Relations](#)[Select Language](#) | ▼

Apply for Water Conservation Rebates

Learn more about receiving rebates for installing high-efficiency toilets and urinals, purchasing a high-efficiency washer, installing rainwater harvesting and gray water systems, and receiving customized incentive packages for businesses.



Other rebates/incentives available:

- [Southwest Gas Residential & Commercial Energy Efficiency Rebates](#)
- [Tucson Electric Power Renewable and Conservation Programs](#)

Residential Rebates

Learn how you can receive Tucson Water rebates of \$75 to \$2,000 for installing high-efficiency toilets, high-efficiency clothes washers, and rainwater harvesting and gray water systems.

- [High-Efficiency Toilet \(HET\) Rebate](#)
- [Limited-Income, High-Efficiency Toilet \(HET\) Rebate](#)
- [Clothes Washer Rebate](#)
- [Rainwater Harvesting Rebate](#)
- [Rainwater Harvesting Grant \(Limited-Income Program\)](#)
- [Gray Water Rebate](#)

Commercial and Multifamily Rebates





Learn more about receiving rebates for installing high-efficiency toilets and urinals and saving money via water-saving audits.

- [High-Efficiency Toilet \(HET\) Rebate](#)
- [High-Efficiency Urinal \(HEU\) Rebate](#)
- [Tucson Audit Program \(TAP\)](#)

Gray Water Rebate

Gray water is wastewater collected from the drains of hand-washing sinks, showers, bathtubs and clothes washing machines. Of the total amount of wastewater generated in a typical home, 12% is from clothes washers, 10% is from faucets, and 9% is from showers. That's a total of 31% that can be re-used as gray water for landscape plants, fruit trees, and lawns.

Tucson Water's Single Family Residential Gray Water Rebate Program will reimburse you up to \$1,000 when a permanent gray water irrigation system is installed in your home.

Applicants must submit a W-9 form   for rebates of \$600 or more, which are subject to tax, and will be issued a 1099-MISC   for miscellaneous income. The W-9 form requires submitting your social security number.

Rebate

- Half of qualifying residential gray water system costs, up to \$1,000.
- Rebate funds are limited and will be distributed on a first come, first served basis.



Rebate Covers

- ▶ Design costs (up to \$200)
- ▶ Materials
- ▶ Storage tanks
- ▶ Filters, pumps
- ▶ Backflow prevention assembly
- ▶ Installation

Does not cover

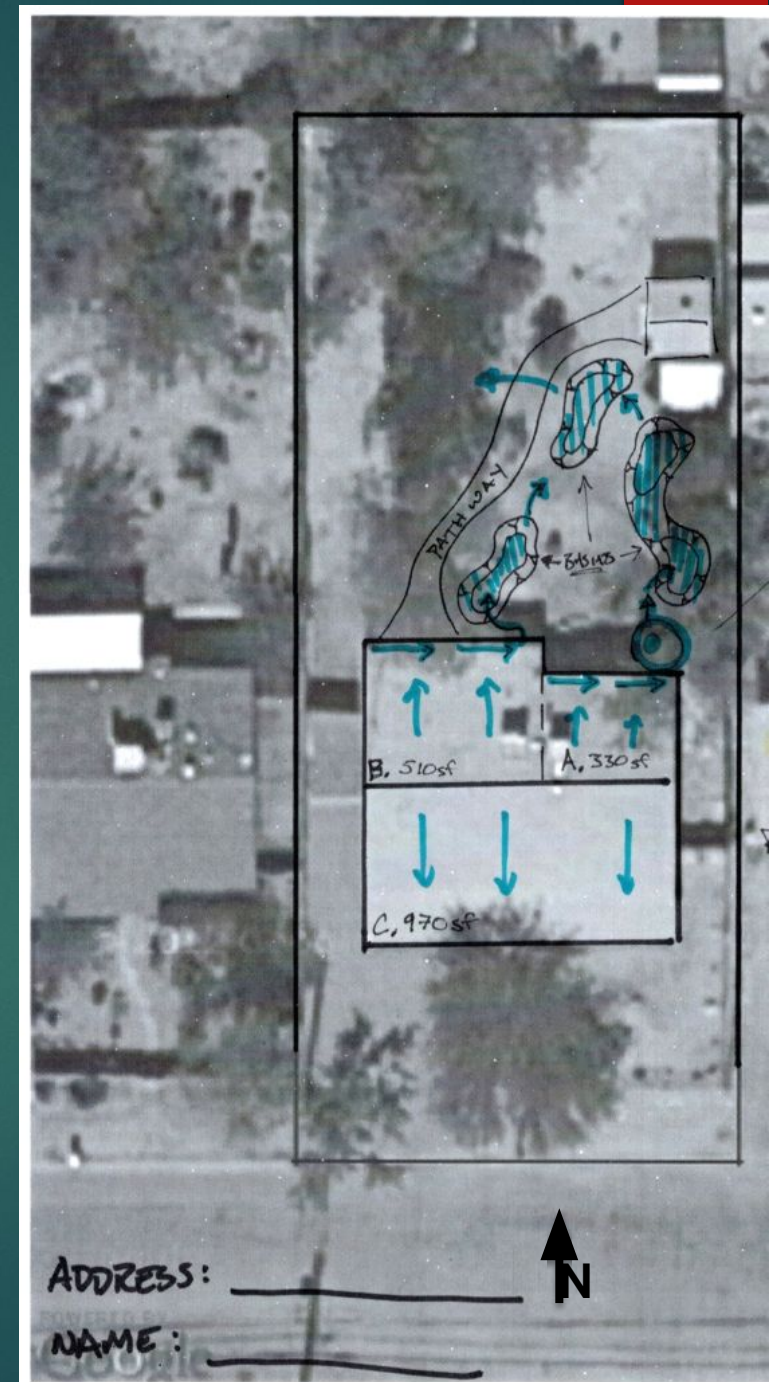
- ▶ hoses other non-permanent fixtures, bathroom remodel materials, workshops, plants and sales taxes.

How to Apply

- Complete the greywater rebate [online application form.](#)
- Upload the original itemized receipt(s) for the qualifying materials and labor costs.
- Create an aerial Project Plan with details about your system and upload to Tucson Water application form
- Questions? Call Tucson Water 520-791-4331

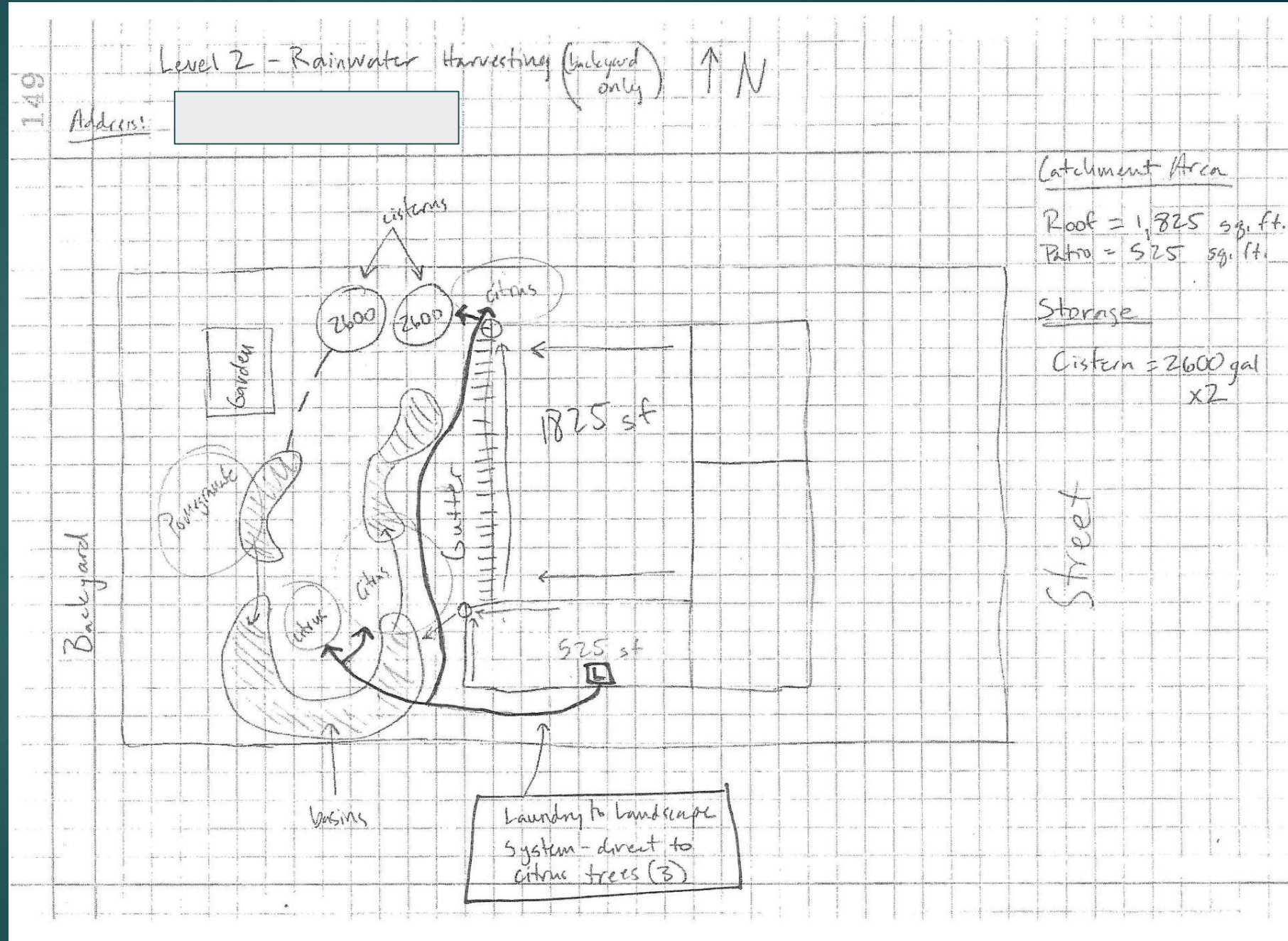
Tucson Water Requires a Project Plan with Your Application

- ▶ Can be hand drawn
- ▶ Label North
- ▶ Include street address, first and last name, & property lines
- ▶ Label Greywater Source
- ▶ Show system components
- ▶ Show intended use for greywater



Greywater Site Plan Features:

- Show & label greywater sources
- System components
 - Pipe from washer underground along exterior wall, screened exit, discharge into basin
- Water uses
 - Fig, pomegranate & shrubs



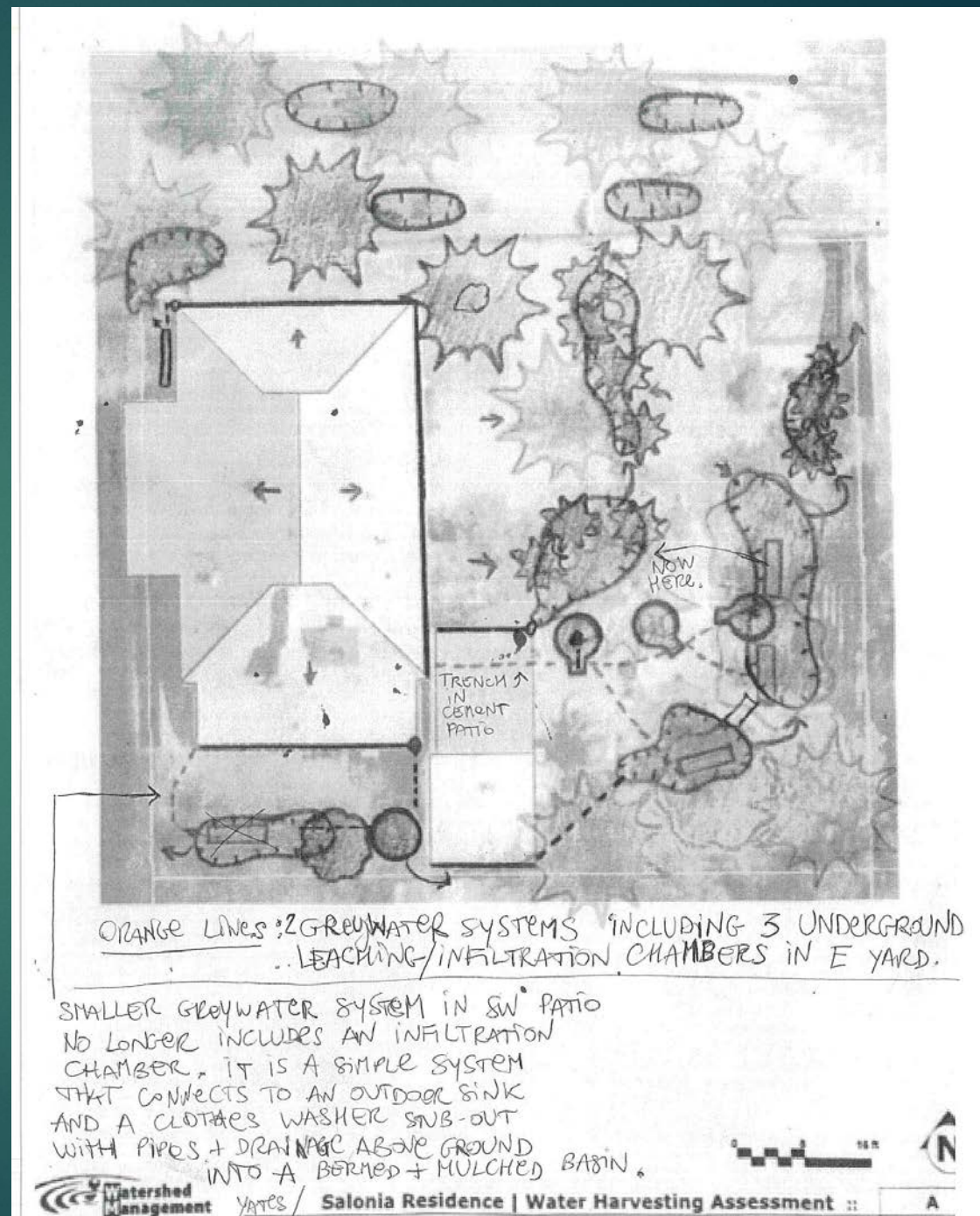
Greywater Site Plan Features:

- Show & label greywater sources
 - L2L Greywater System
- System components
 - Pipe
- Water uses
 - Trees and shrubs



Greywater Site Plan Features:

- Show & label greywater sources
 - Outdoor sink and washer
- System components
 - Trenched pipe, infiltration basins
- Water uses
 - Trees & Shrubs

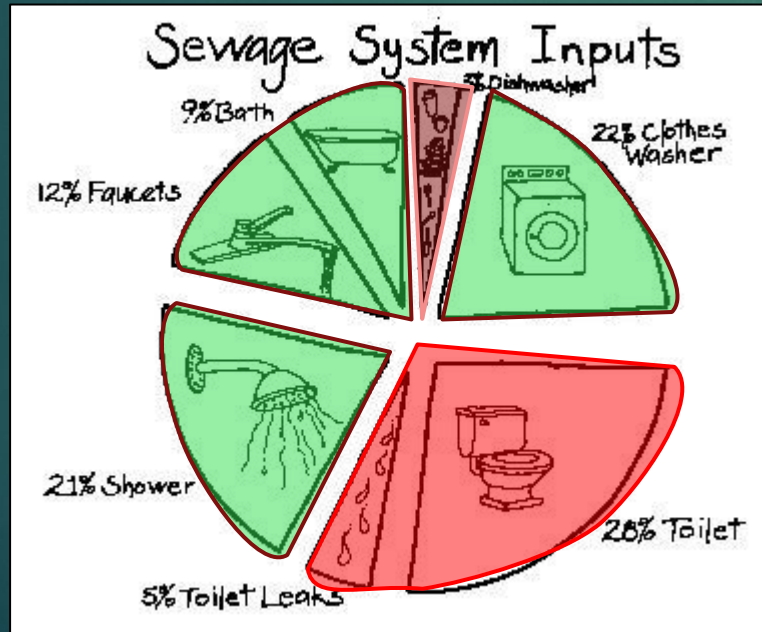




Questions?

What is Greywater?

- ▶ From the shower, hand sinks, and laundry (and sometimes the kitchen sink).
- ▶ Reused for beneficial purposes.
- ▶ It does not include toilet water (blackwater) or dishwashing machine water.



Your typical Supply

- ▶ Top loading = ~30-40 gallons/load
- ▶ Front loading = ~15-20 gallons/load

- ▶ Front, 3 loads/wk = ~2,800 gallons per year
 - ▣ Irrigate 1 mature dwarf citrus or 2 pomegranates or 1 fig

- ▶ Front, 5 loads/wk = ~4,700 gallons per year
 - ▣ Irrigate Citrus + Pomegranate or ...



Let's calculate how much greywater you produce

Average annual production:

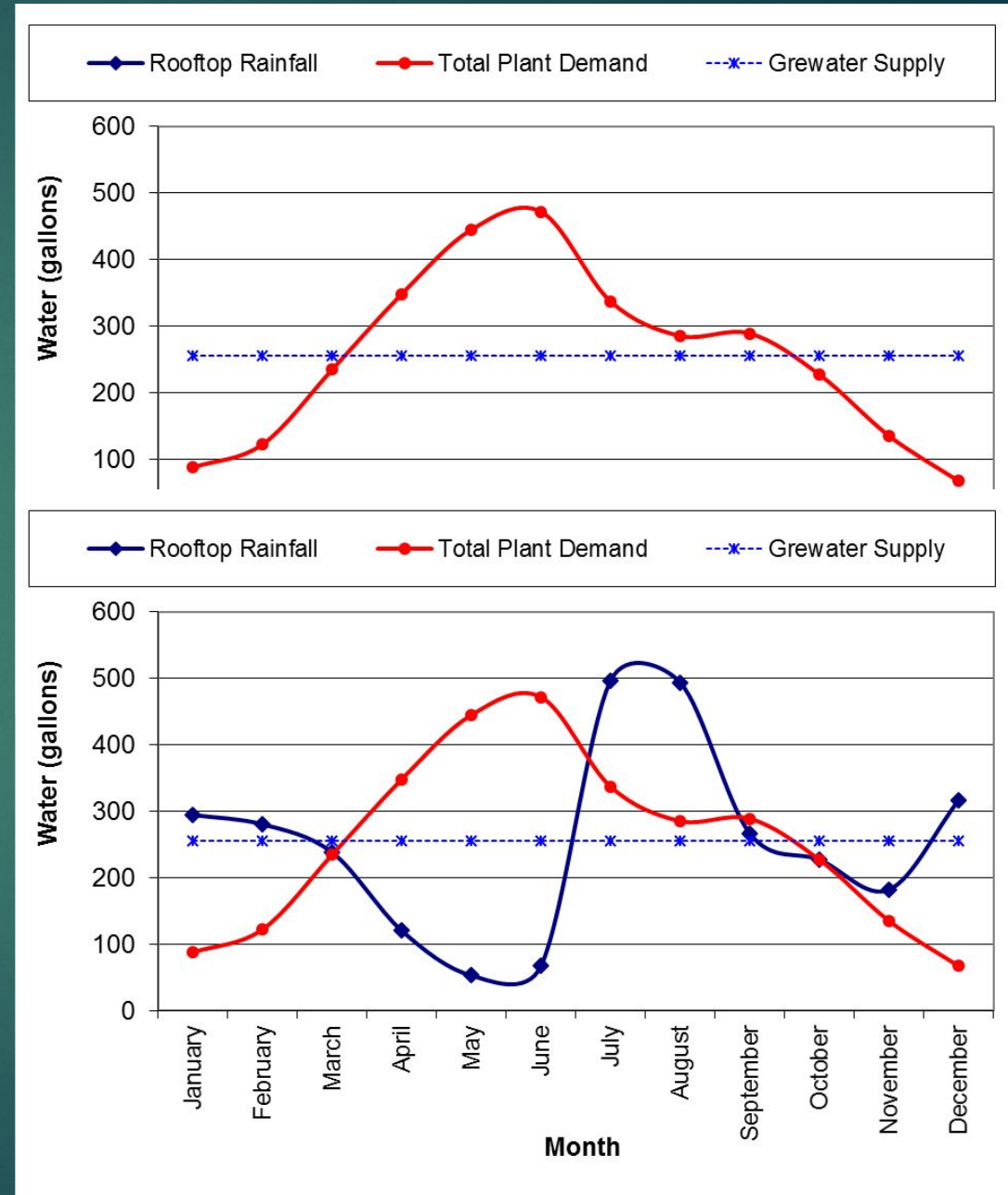
Laundry: ___gal/use * ___ uses/week * 52 weeks

Shower: ___gal/min * ___ min * ___ persons * 350 days

Pairing Your Supply and Demand

Greywater = 3000gal/yr
10 ft diameter Citrus Demand = 3000gal/yr

Greywater = 3000gal/yr
Rainfall = 500 sq.ft. roof
Citrus Demand = 3000gal/yr



Create a Water Budget

Use greywater as a supplement irrigation resource for your tree

- ▶ Greywater: excess production in cool season; deficit in warm season
- ▶ Make up remaining warm season demand with stored rainwater, AC condensate, Evaporative cooler bleed-off

watershedmg.org/water-budget-calculator

...and during the winter months

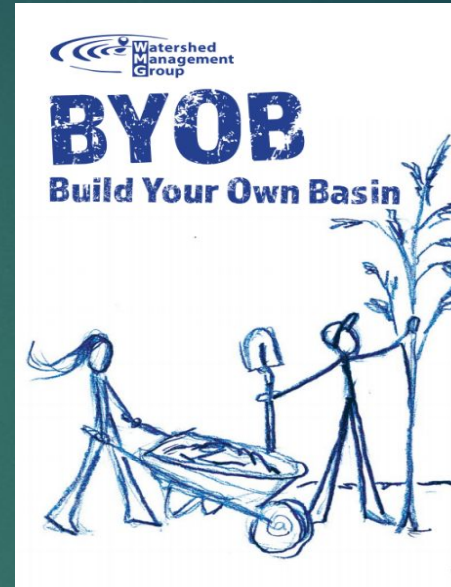


What can you NOT do with greywater?



Learn how to build a basin & Get Your BYOB Kit!

- Native shade tree
- Native shrubs
- Cactus cuttings or pups
- Wildflower and native bunch grass seeds
- Organic mulch



Take a class to be able to pick up a BYOB Kit!

Sep - Oct 2021

Virtual: Tuesdays @5:30p.m.

In-Person: Saturdays @8a.m.

watershedmg.org/BYOB



Questions? Contact Luis Salgado
| lsalgado@watershedmg.org | 520-396-3266 x20.





Let's go for a virtual tour!



Laundry to Landscape

Clean your clothes and water a fruit grove.

Sending washing machine water – commonly known as greywater – is one of the easiest ways to repurpose used water in your household. The laundry to landscape system relies on the washing machine pump to distribute water up to 100 feet from the machine out to your landscape. The flow can be split up to eight times to distribute greywater around your garden. With some simple plumbing modifications, you can save thousands of gallons of water a year in irrigation and grow fruit trees guilt free.

Lave su Ropa y Riegue sus Frutales

Mandarón el agua de la lavadora – comúnmente conocida como agua gris – al patio es una de las formas más fáciles de re-usar el agua de su casa. El sistema de lavado al patio utiliza la bomba de la lavadora para distribuir el agua hasta 100 pies desde la lavadora al patio. Se pueden instalar hasta 8 puntos para distribuir el agua en el jardín. Con unas pequeñas modificaciones de plomería, se pueden ahorrar miles de galones de agua al año en irrigación de árboles frutales.



- 1 Laundry detergent must be low in sodium and have no borax or bleach.
Detergente debe ser de bajo sodio y no tener borax o lejía.
- 2 Washing machine pump
Lavadora
- 3 Diverter valve to safely send your laundry water back to sewer when needed, except when using bleach or other toxic detergents.
Desviación de agua para enviar el lavado al desagüe o al sistema de riego cuando se use detergente o jabón tóxico.
- 4 One-way air vent to prevent a siphon from forming.
Ventilador contra sifoneo para prevenir que se forme un sifón.
- 5 Transition from PVC to black polyethylene pipe.
Transición de PVC a tubo negro de polietileno. Evitar el uso de tuberías rígidas.
- 6 Outlets with valves to control amount of flow each destination.
Codos con válvulas para controlar el flujo hacia cada punto.
- 7 Mulched basin to collect greywater to be used.
Cubeta con acolchado para recoger el agua gris.
- 8 Thirsty fruit tree to be irrigated.



Laundry to Landscape -> irrigates Sonoran Food Forest



Laundry to Landscape:
components

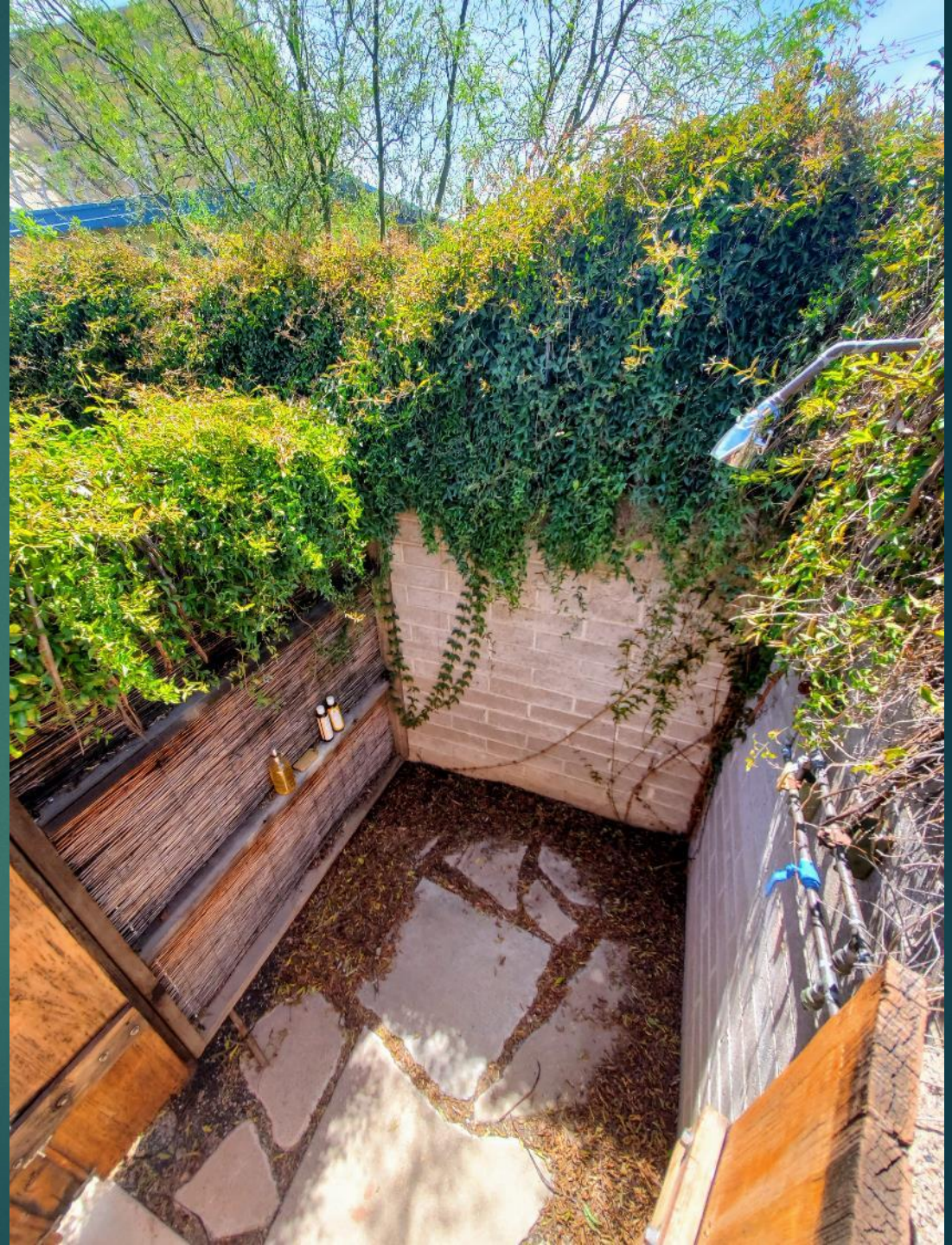
Sink and AC Condensate -> gravity drain to Sonoran Food Forest



Sink and Indoor Shower ->
gravity drain to irrigate
citrus tree



Solar-heated Outdoor Shower Oasis







Underground infiltration chamber



Underground infiltration chamber (interior view)



Learn more: <https://watershedmg.org/tippy taps>

Questions?



Arizona Department of Environmental Quality (ADEQ) Guidelines

www.azdeq.gov/environ/water/permits/download/graybro.pdf

Self-permitting Process:

- ▶ Be used on-site only
- ▶ Residential use
- ▶ Irrigation use only
- ▶ Graywater flow < 400 gallons per day
- ▶ Follow 13 best management practices

General Precautions

- ▶ No bleach
- ▶ No soaps with salts
- ▶ No clothes soiled with bodily fluids
- ▶ Avoid over-saturating soil
 - ▣ You can drown plants
 - ▣ Promote anaerobic soil with unpleasant smells
- ▶ Avoid human or animal contact with graywater – due to higher bacterial content

Products/Items to AVOID

www.harvestingrainwater.com/greywater-harvesting/ecologycenter.org/factsheets/greywater-cleaning-products.html

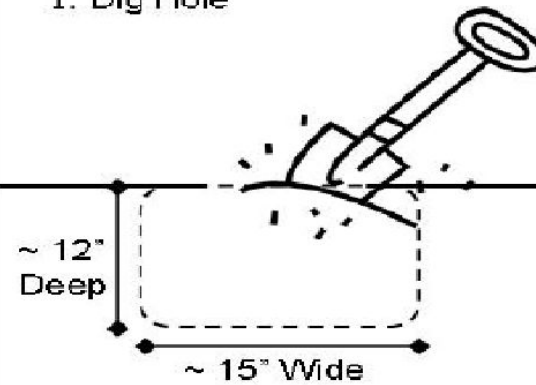
- ▶ chlorine or bleach
- ▶ Peroxygen
- ▶ Salts (sodium)
- ▶ sodium perborate
- ▶ sodium trypochlorite
- ▶ Sodium lauryl sulfate
- ▶ boron
- ▶ borax
- ▶ petroleum distillate
- ▶ alkylbenzene
- ▶ "whiteners"
- ▶ "softeners"
- ▶ "enzymatic" components



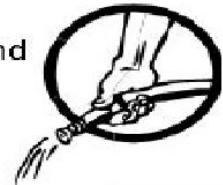
Photo courtesy of Art Ludwig
www.OasisDesign.net



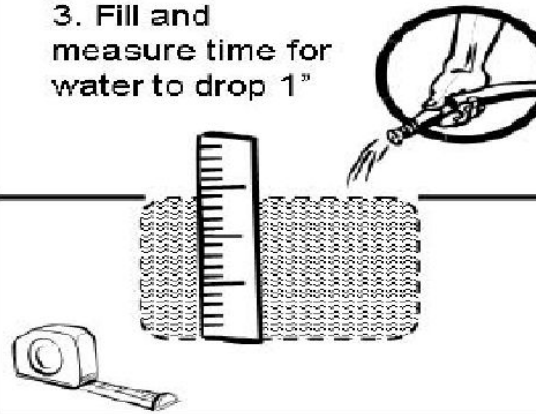
1. Dig Hole



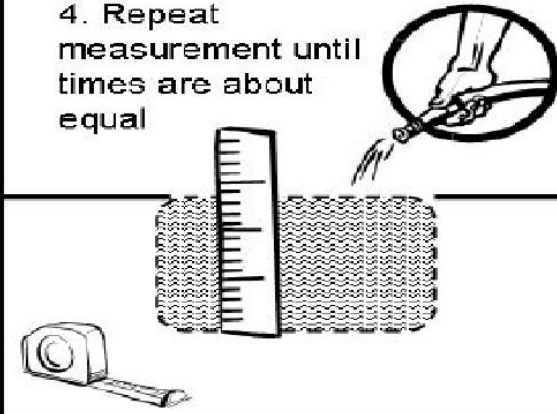
2. Soak multiple times and let stand overnight



3. Fill and measure time for water to drop 1"



4. Repeat measurement until times are about equal



Plant & Mulch!





Image: Brad Lancaster, [Rainwater Harvesting for Drylands & Beyond](#)

Bathtub retrofit





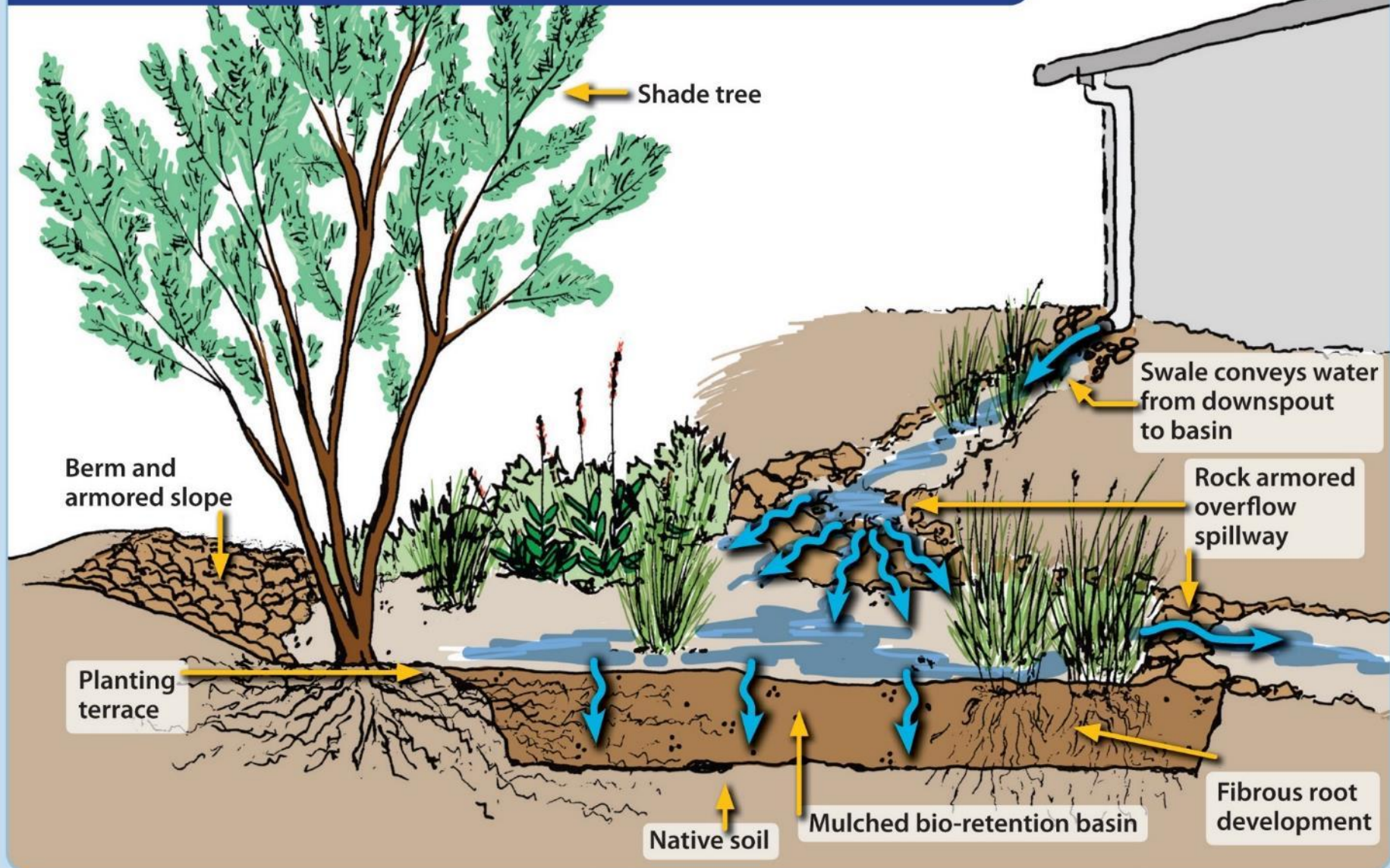
Branched drain: for baths, showers, and sinks



MULCH!!



RAIN GARDENS CREATE AN EARTHWORKS SPONGE



Organic mulch is applied to basins, 2 – 4 inches thick, to help infiltrate more water, reduce evaporation of soil moisture, and replenish nutrients in the soil.

For Laundry Greywater

INSIDE

OUTSIDE





Questions?



Composting Toilet Kits



- ▶ \$911 cost includes assembled kit and training

watershedmg.org/services/home

Laundry-to-Landscape (L2L) Greywater

- \$157 to \$190 depending on assembled kit options, includes troubleshooting and other tips
- Reserve your kit today!



Plumbing and Irrigation Parts

Diversion Kit (indoor)



Distribution kit (outdoor)



Get Involved & Learn More with WMG

WMG's Tucson Events Calendar: watershedmg.org/event





Services to help you:

watershedmg.org/services/home

- ▶ Specialist Visits (\$75 for hour visit)
- ▶ *Special discounts for limited income, non-profits, and schools*

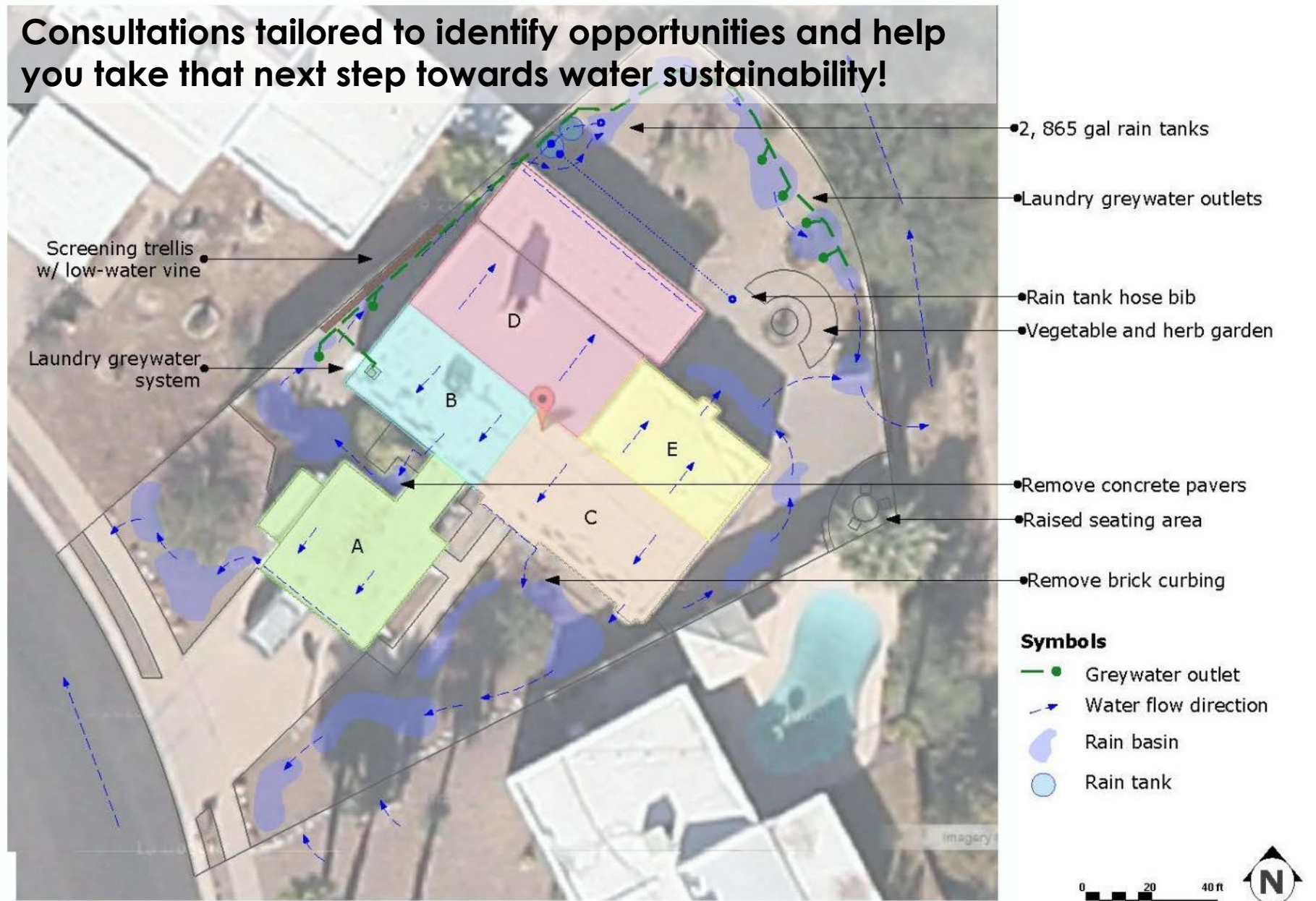
Questions? Contact Charlie Alcorn
| calcorn@watershedmg.org | 520-396-3266 x3.

Let us chick out your yard

Schedule a beakyard
design consult today
watershedmg.org/services



Consultations tailored to identify opportunities and help you take that next step towards water sustainability!



Screening trellis w/ low-water vine
 Laundry greywater system

- 2, 865 gal rain tanks
- Laundry greywater outlets
- Rain tank hose bib
- Vegetable and herb garden
- Remove concrete pavers
- Raised seating area
- Remove brick curbing

- Symbols**
- Greywater outlet
 - Water flow direction
 - Rain basin
 - Rain tank



Plan created with Trimble Sketchup Pro by Catlow Shipek

Lensink Residence | Conceptual Site Plan

Tucson, AZ

scale: 1:240

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We've reached the end of the class!

- ▶ **Please fill out the survey that will be emailed to you. We value your feedback!**
- ▶ If you joined late, please text your name in the chat window so we can confirm your attendance.
- ▶ You must self report your attendance using the link shared during the class or the link shared in the follow up email
- ▶ If you'd like more info about a site or virtual consultation, please contact Charlie Alcorn calcorn@watershedmg.org.
- ▶ Don't forget to sign up for the:
 - ▶ River Run Network: watershedmg.org/RRN
 - ▶ Tucson Action e-Bulletin: watershedmg.org/get-involved

GIVING TUESDAY



Restore the Flow & Go Hydro-Local

Tuesday, November 29th

Restore and protect the creeks we love, like the Tanque Verde Creek, flowing again seasonally in east Tucson thanks to hydro-local efforts.

Restaura el flujo y hazte hidro-local

Martes, 29 de Noviembre

Restaura y protege los arroyos que amamos, como el Tanque Verde, que está fluyendo nuevamente de manera estacional en el este de Tucson gracias a los esfuerzos hidro-locales.

[Watershedmg.org/Give](https://watershedmg.org/Give)



Thank you for virtually visiting our
Living Lab and Learning Center

watershedmg.org/living-lab