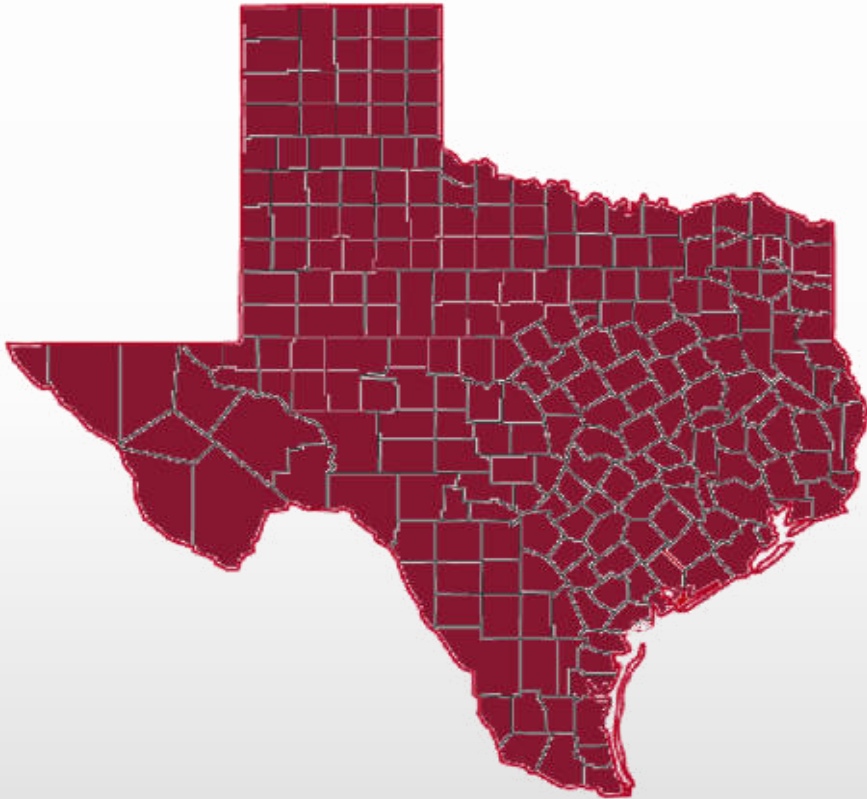


ALL THINGS WATER

KERR COUNTY



LANDSCAPING FOR WATER CONSERVATION



Presented by:

Anne Brown

Hill Country Master Gardeners

**resources in the area are currently over-
appropriated and many local watersheds are**



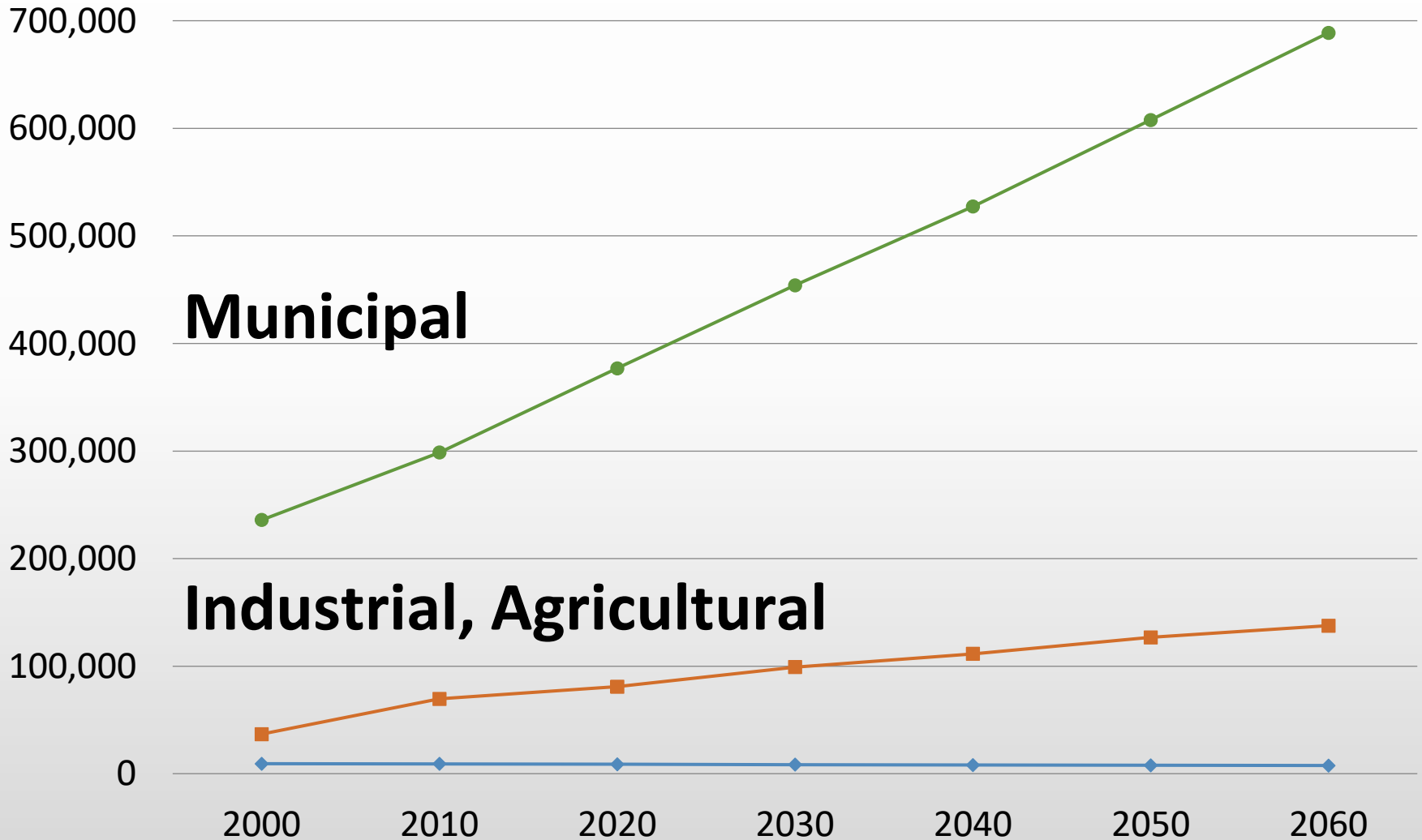
**impaired and are in no way prepared for the
rapid population growth and development.**

Water Rights in Texas

The majority of current water rights in the state are still held by agriculture, while the greatest demand for water lies within the municipal and Industrial/Commercial/Institutional sectors.



Increased Future Water Needs



Two Steps

1. Proper plant selection
2. Harvest Rain for when it comes so - you have it when you need it



No Place But Austin!!!



1/3 – 1/3 – 1/3 – or less

- **Turf** – largest user of water in the summer in the landscape
- **Reduce** to 1/3 or less – only if needed
- **Use drought tolerant grasses**
 - Buffalo
 - Bermuda
 - Zoysia

1/3 hardscape

1/3 softscape – shrubs, trees, perennials

Practical Turf Areas



Ranch House Using Rainwater

9,000 square feet of roof all guttered
with drain underground





Downspouts carry water through 4” pipes from the front and back





Water drains into an 18,000 gallon collection tank to be used for watering the landscape





Thomas Jefferson's RWH at Monticello 4- 3,830 gallon cisterns



Because of periodic shortages of water, Mr. Jefferson installed four cisterns. They were placed at strategic points to collect rainwater from the roof and walkways. Each held 3,830 gallons.

The Bullitt Foundation
officially opened its Bullitt Center
It includes: **net zero energy, waste and water**



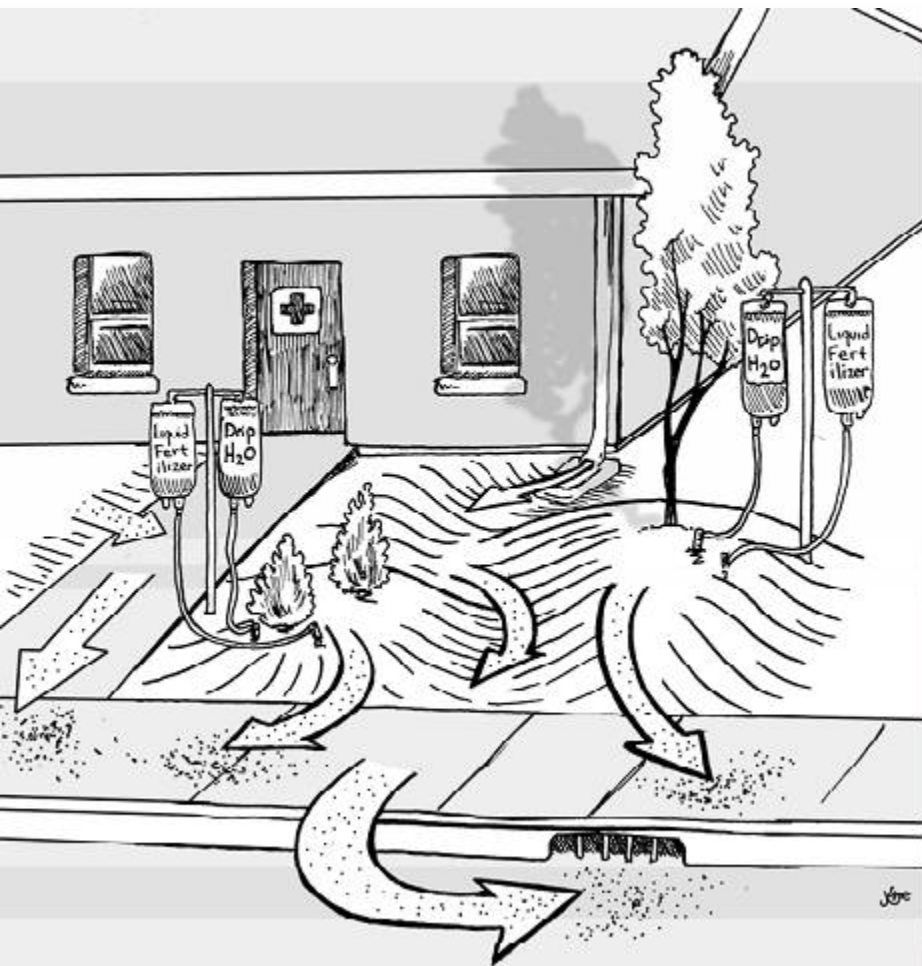
And houses a - 56,000-gallon basement cistern.

Passive Collection

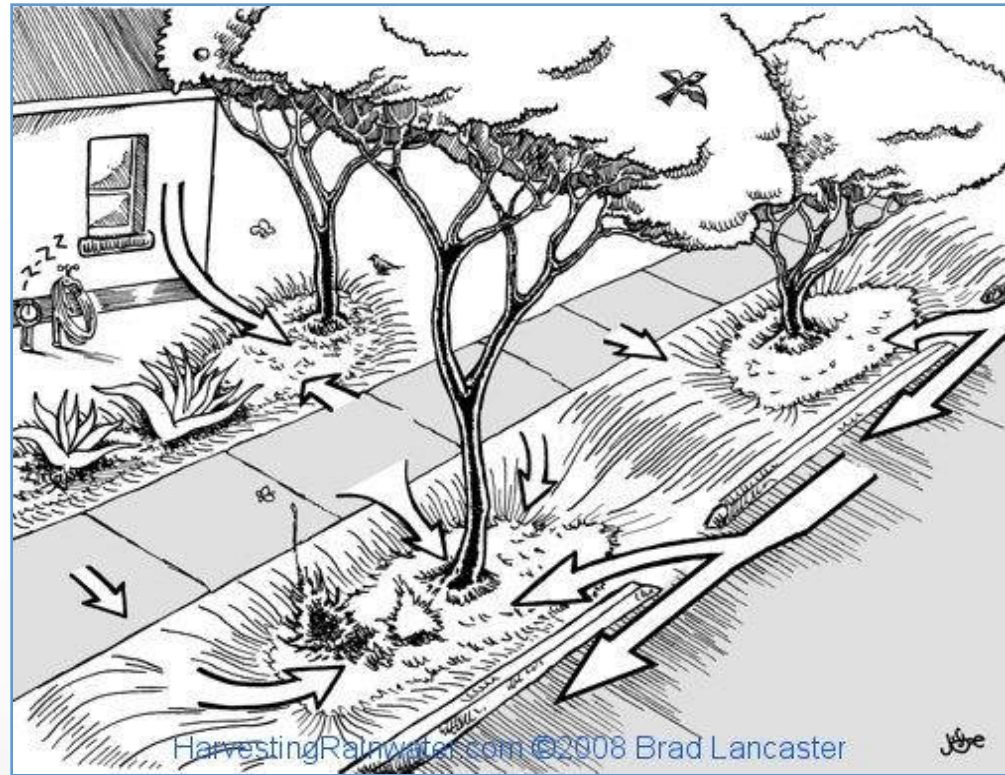
- ✓ Rain gardens
- ✓ Bog gardens
- ✓ Soil storage and infiltration systems
- ✓ Ponds
- ✓ Constructed wetlands
- ✓ Gabion baskets
- ✓ Water spreading
- ✓ Pervious paving
- ✓ Green Roofs



Make water take the Long Way to the river



Passive Rainwater Harvesting Major Benefits



- Take out energy
- Increase infiltration
- Manage storm water
- Groundwater Recharge

Rain Gardens







JUNCTION MIDDLE SCHOOL

**JUNCTION
MIDDLE SCHOOL**

WE LOVE OUR EAGLES
GO BLACK

NOV 26 - 28 HOLIDAY

66C-NW4













Rain Garden











TOP 10 TEXAS DROUGHT TOLERANT PLANTS

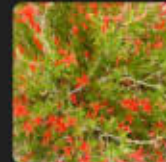


ESPERANZA

Tecoma stans

Bloom Period: Spring - Fall
Host Plant: Dogface butterfly
Wildlife Benefits: Nectar for pollinators.

Large Shrub | 6-10 ft. | Full Sun - Part Sun



FLAME ACANTHUS

Androsaceum quadrifidus

Bloom Period: July - Sept.
Host Plant: Crimson Patch & Texas Crescent butterflies
Wildlife Benefits: Nectar for pollinators. Deer resistant.

Large Shrub | 3-5 ft. | Full Sun - Part Sun



ZEXMENIA

Wedelia acapulcensis var. *hispidula*

Bloom Period: May - Nov.
Host Plant: Bordered Patch, Sierran Metalmark, Lacinia Patch butterflies.
Wildlife Benefits: Nectar & pollen. Birds eat seed heads.

Perennial Flower | 1-3 ft. | Full Sun - Part Sun



CENIZO

Leucophyllum frutescens

Bloom Period: During rain periods throughout the year
Host Plant: Theona Checkerspot and Calleta Silkmoth
Wildlife Benefits: Shelter for birds & mammals. Deer resistant.

Large Evergreen Shrub | 6+ ft. | Full Sun



FOUR NERVE DAISY

Fettersia acutata var. *arizonica*

Bloom Period: April - Sept.
Host Plant: N/A
Wildlife Benefits: Nectar and pollen.

Perennial Flower | 1 ft. | Full Sun - Part Sun



BLACKFOOT DAISY

Asteropodium leucanthum

Bloom Period: Mar. - Nov.
Host Plant: N/A
Wildlife Benefits: Nectar for pollinators, seeds for birds.

Perennial Flower | 1 ft. | Full Sun - Part Sun



TEXAS LANTANA

Lantana urucoides

Bloom Period: April - Oct.
Host Plant: N/A
Wildlife Benefits: Nectar attracts butterflies.

Medium Shrub | 2-4 ft. | Full Sun



MEALY BLUE SAGE

Salvia farinacea

Bloom Period: May - Nov.
Host Plant: N/A
Wildlife Benefits: Nectar and pollen for pollinators, especially bumblebees.

Perennial Flower | 2-3 ft. | Full Sun - Part Sun



AUTUMN SAGE

Salvia greggii

Bloom Period: Mar. - Nov.
Host Plant: N/A
Wildlife Benefits: Nectar for hummingbirds & pollinators. Deer resistant.

Small Shrub | 2-3 ft. | Full Sun



RED YUCCA

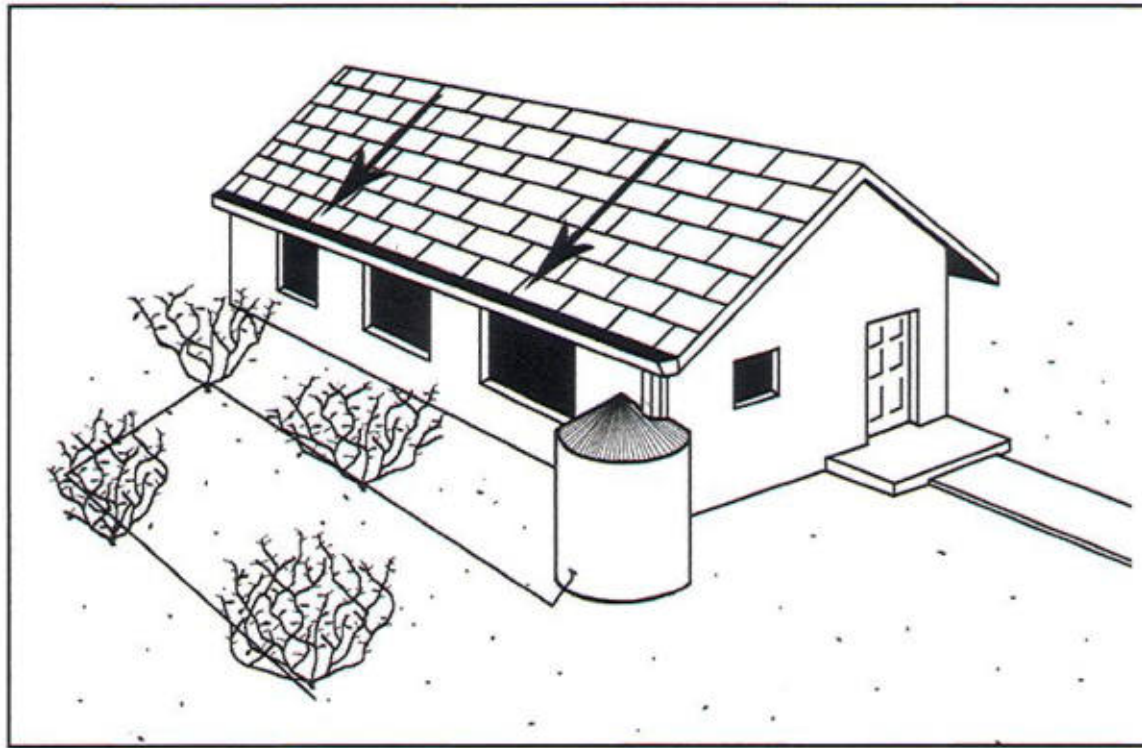
Hesperaloe parviflora

Bloom Period: Mar. - July
Host Plant: N/A
Wildlife Benefits: Nectar for pollinators.

Evergreen Succulent | 3-4 ft. | Full Sun

Step 2

Rainwater Harvesting



Complex water harvesting system with roof catchment, gutter, downspout, storage and drip distribution system.

How to Collect Rainwater

- P **.6 gallons per square foot roof per 1" rainfall**
- P **2,000 sq. foot roof X 1" rain = 1,200 gal. water**
- P **1,200 gal. X 20" rainfall per year= 24,000 gal/yr**



Rain Intensity – Texas – 3-4”/Hour

- 4” per hour
- 0.042 Gallons per minute per square foot



- $1000 \text{ sq}' \times 0.042 = 42 \text{ gallons/minute}$
- Affects:
 - Gutter size,
 - Number and size of downspouts
 - Size of conveyance piping

How Big Does The Roof Need To Be?



5' diameter

Pi times radius squared

$3.14 \times 2.5 \times 2.5 = 19.6$ square feet

$19.6 \times .6 = 11.8$ gallons per 1" rain

4" = Full Tank

24 inches = Filled 6 times/yr



**Filled
12
Times!**



18 Times

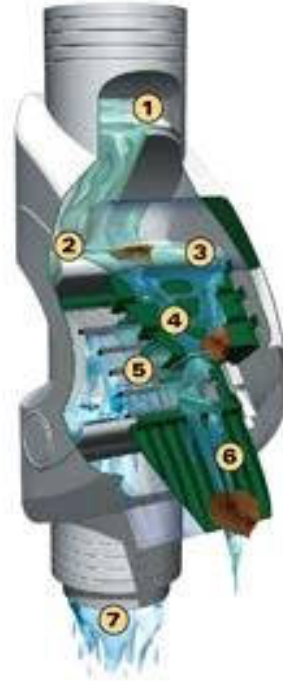
Roofs and Collection Surfaces



Gutters and Downspouts







Cisterns

What are they used for?



Cisterns

- **Durable and water tight - material**
- **Size - where does it go & how much will you collect and need**
- **Cost - \$.50 - 2.25+ per gallon collected**







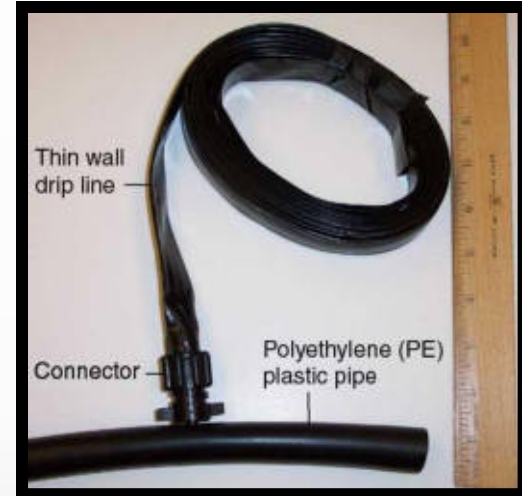




Drip Irrigation



Types of Drip Irrigation



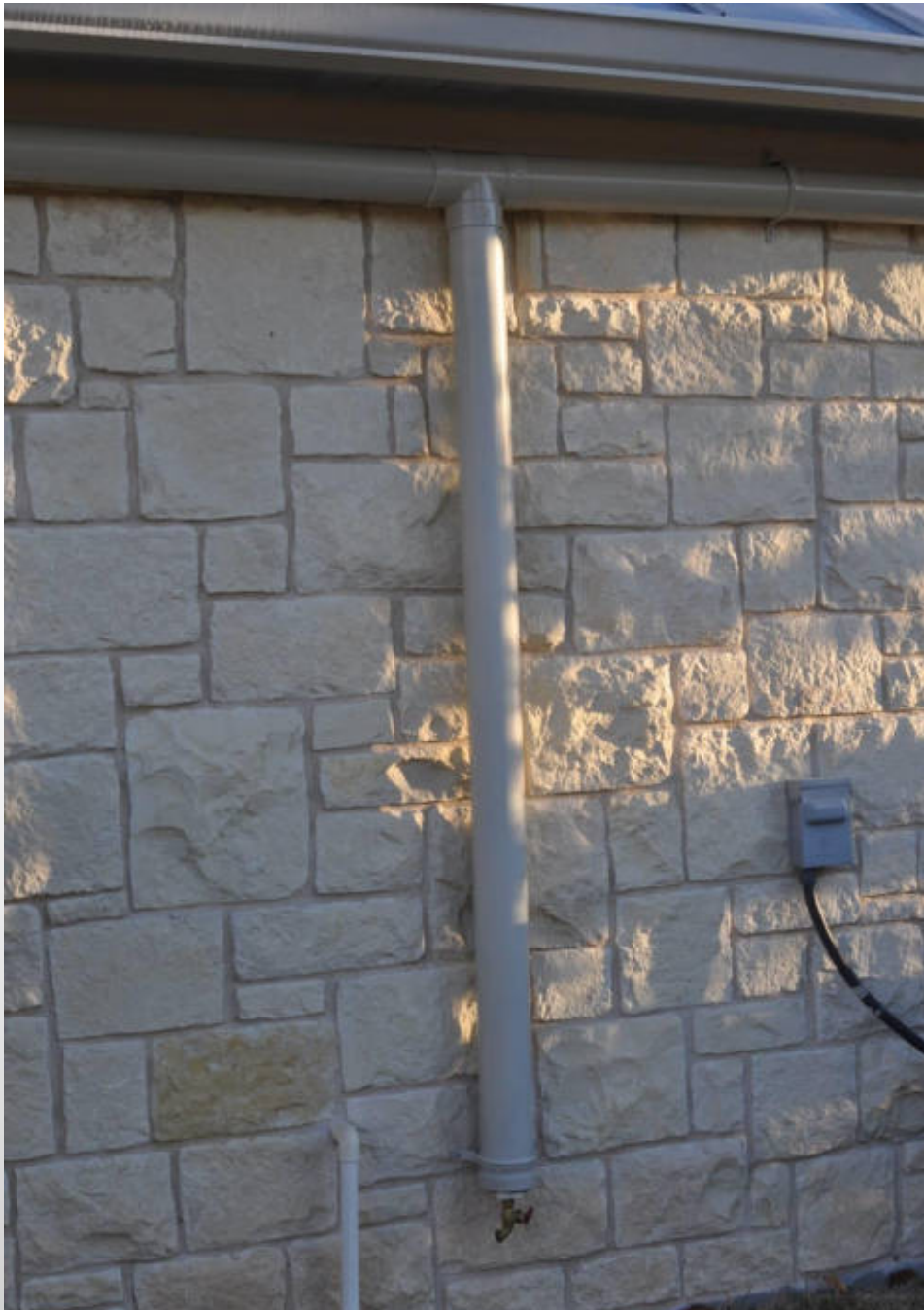


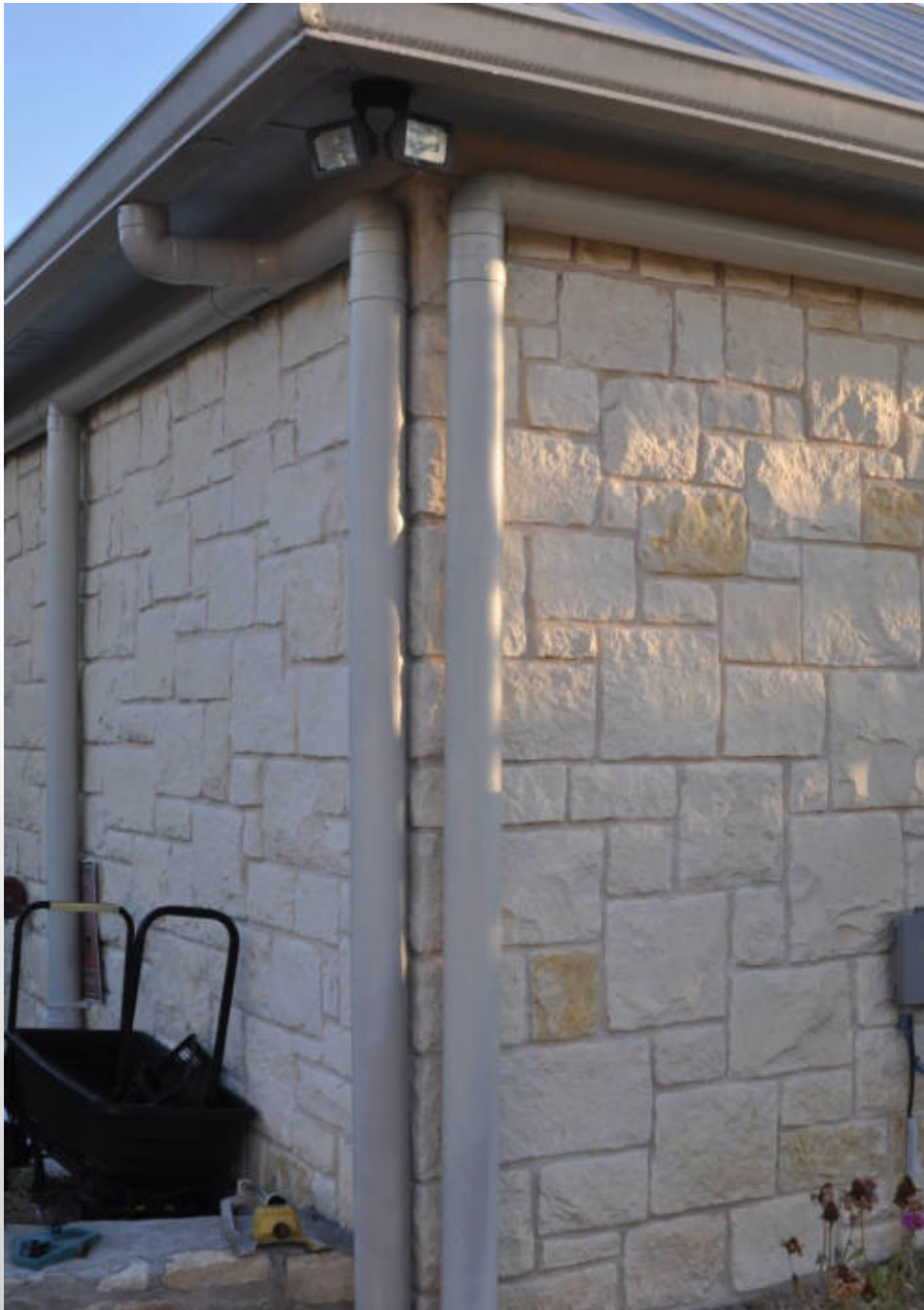


<http://rainwaterharvesting.tamu.edu>

















Thank You – Anne Brown