

https://RainBees.com Rain Harvesting Consultants



Reggie Coots



Foe DiPasquale



Dr. Larry Sunn 210.286.8050







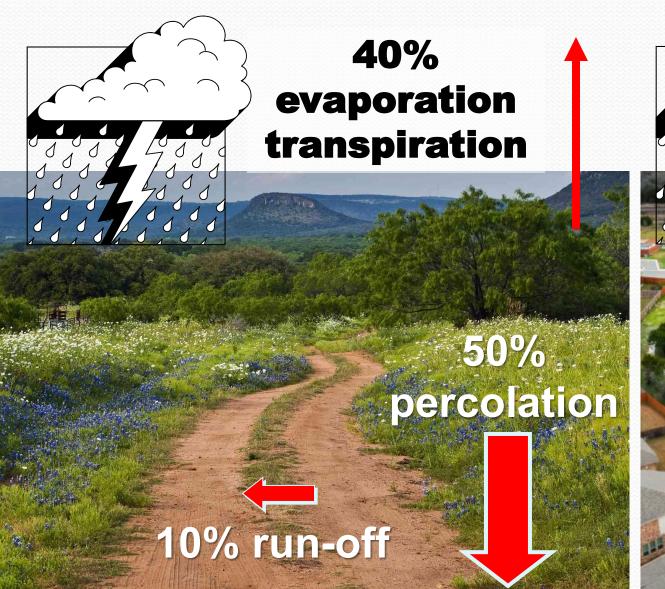


" When the well runs dry we know the worth of water"

Benjamin Franklin



Development's Impact on Water Cycle





15%

percolation

55% run-off

It's Not a Drought Issue!





San Francisco, Tampa, Daytona Beach

Soon: New Braunfels, Dallas, San Antonio



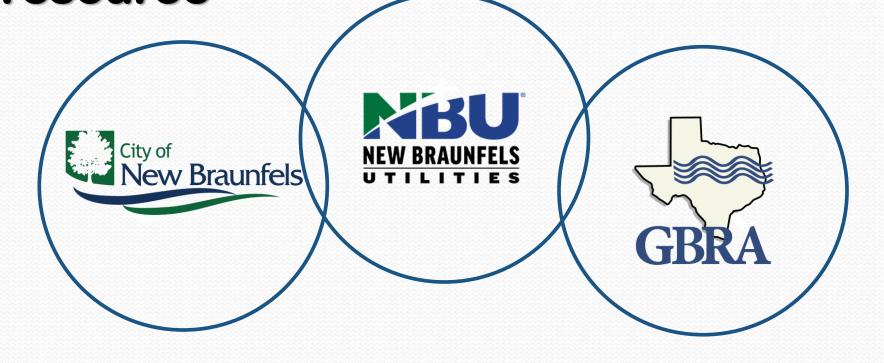


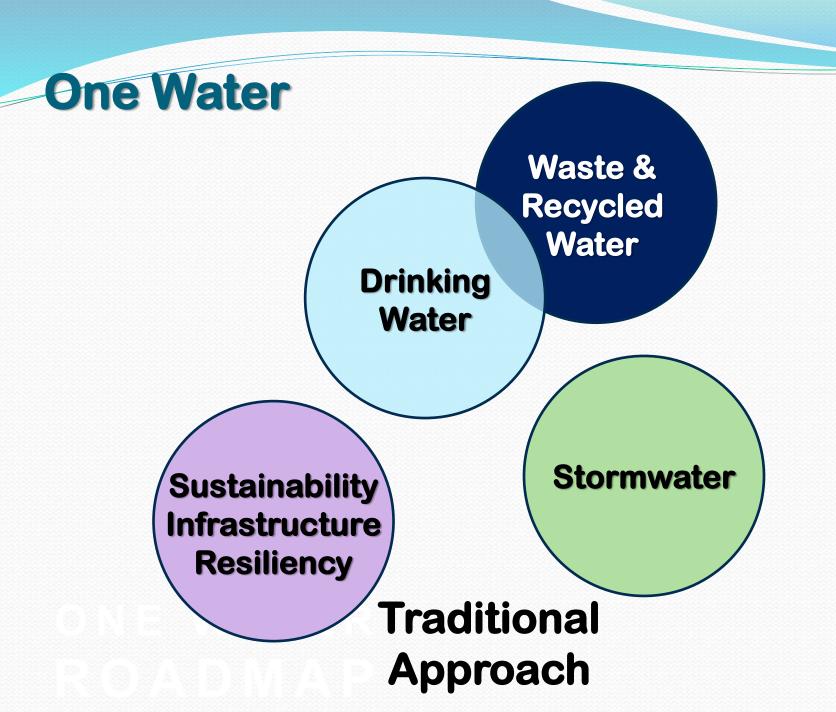




One Water

"An integrated approach to managing all water—drinking water, wastewater, stormwater, graywater—as a single resource"











One Water



Keep it fresh. Keep it flowing.

Waste & Recycled **Drinking** Water Water One Climate Water Sustainability Change Infrastructure Resiliency **Stormwater**

ONE WATER ROADWAP





- Plan for & manage water resources sustainably
- Maximize environmental, social, & economic benefits
- 3 Ensure water remains an economic feature
- Provide clean, high-quality water
- Ensure healthy watersheds, waterways, & groundwater.

How to Sustain Water Supply

Increase Supply



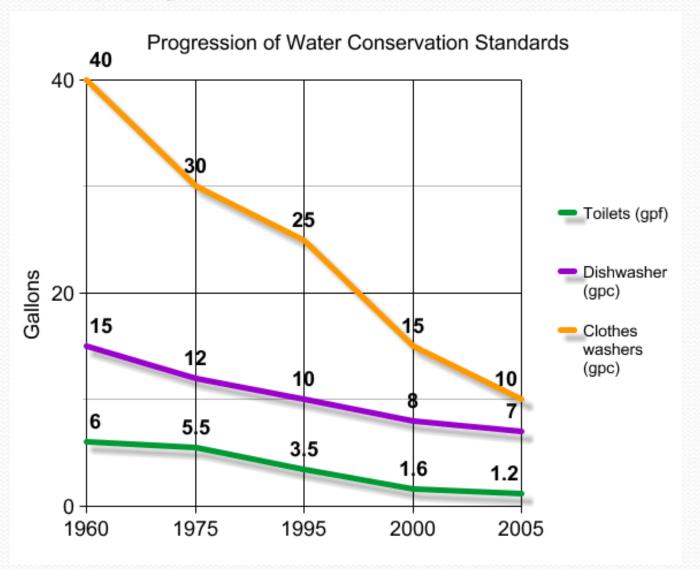




How to Sustain Water Supply







How to Sustain Water Supply

Do both!





2 truc

32 pallet

HOA: "30

1 acre - 43

1 pallet = 450 SqFt

~two-car garage



How Much Water?

Water Cycles			52
	# Cycles	# Week	s Cycles
1 Jan – Feb	0		0
2 March	1	x 4	4
3 April	2	x 4	8
4 May	2	x 3*	6*
5 June* Assun	nes 2 ² wee	ks of ra	in & YOU ^{6*}
6 Julyremember	er to furn	off the	sprinklers
7 August		x 4	8
8 September	2	x 3*	6*
9 October	2	x 3*	6*
10 Nov – Dec	0		0

How Much Water for 52 Cycles?

One-acre lot

HOA requires 30% grass

14,494 sqft

7,000 sqft x .62 x 30 = 130,000 gal annual rain collection



 $52 \times 0.62 \times 0.6 \times 14,494 = 280,372$ gallons

Remember the 800 SqFt Pool?

- ❖Pools evaporate at 3½" per week
- sqft x .62 x 3.5"/wk x 4 weeks = monthly evaporation



 $800 \times .62 \times 3.5 \times 4 = 6,729 \text{ gal/mo} (33,600 \text{ annual})$

How Much Water for 52 Cycles?

- One-acre lot
 - *HOA requires 30% grass
 - 14,494 sqft





183,972/52/.62/.6 = 9,511 SqFt of grass

How Much Water for 52 Cycles?

One-acre lot

HOA requires 30% grass
\$14,494 sqft



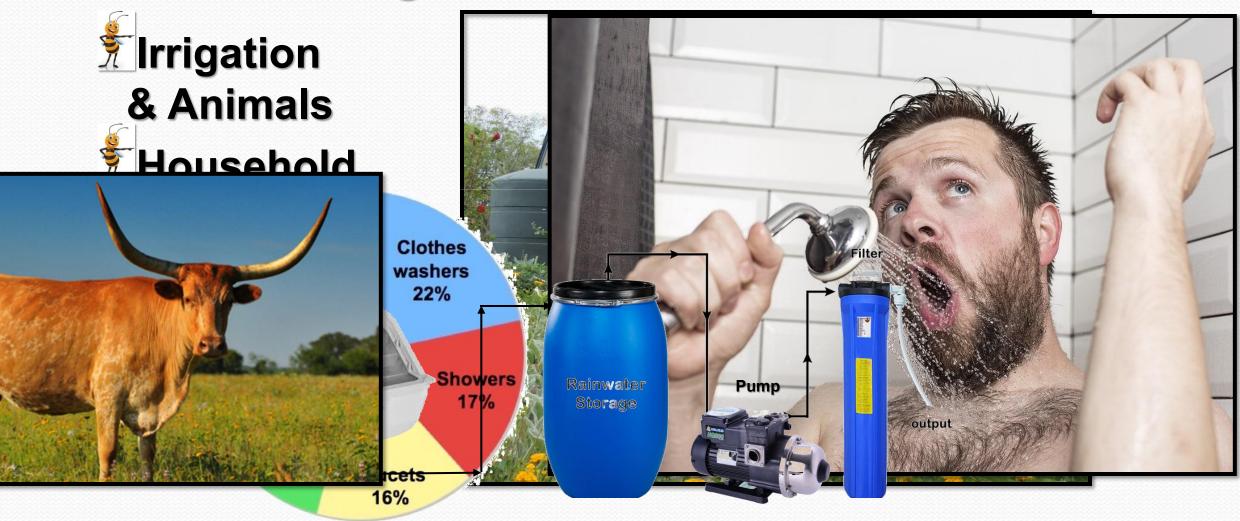


183,972/52/.6/.62 = 9,511 SqFt of grass

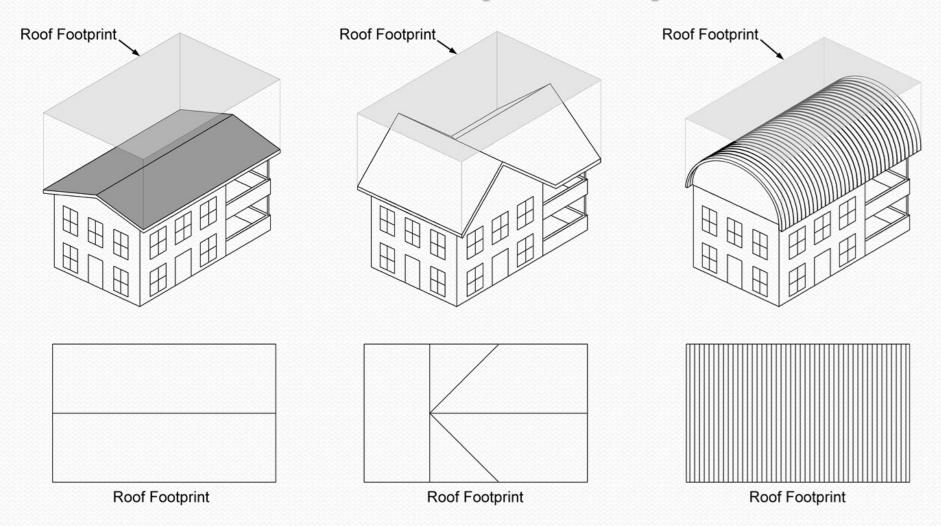




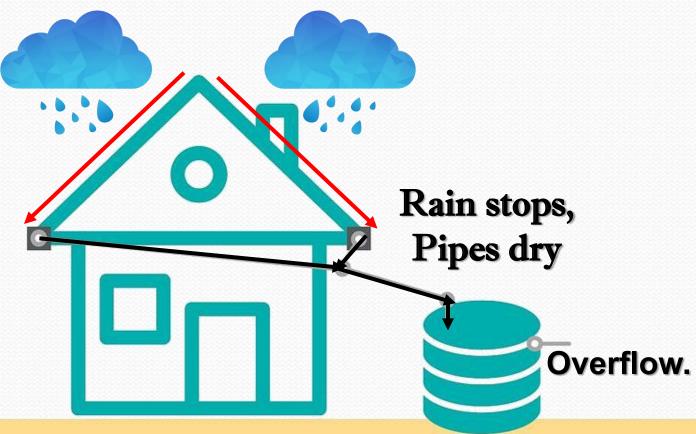
Rain Harvesting Use

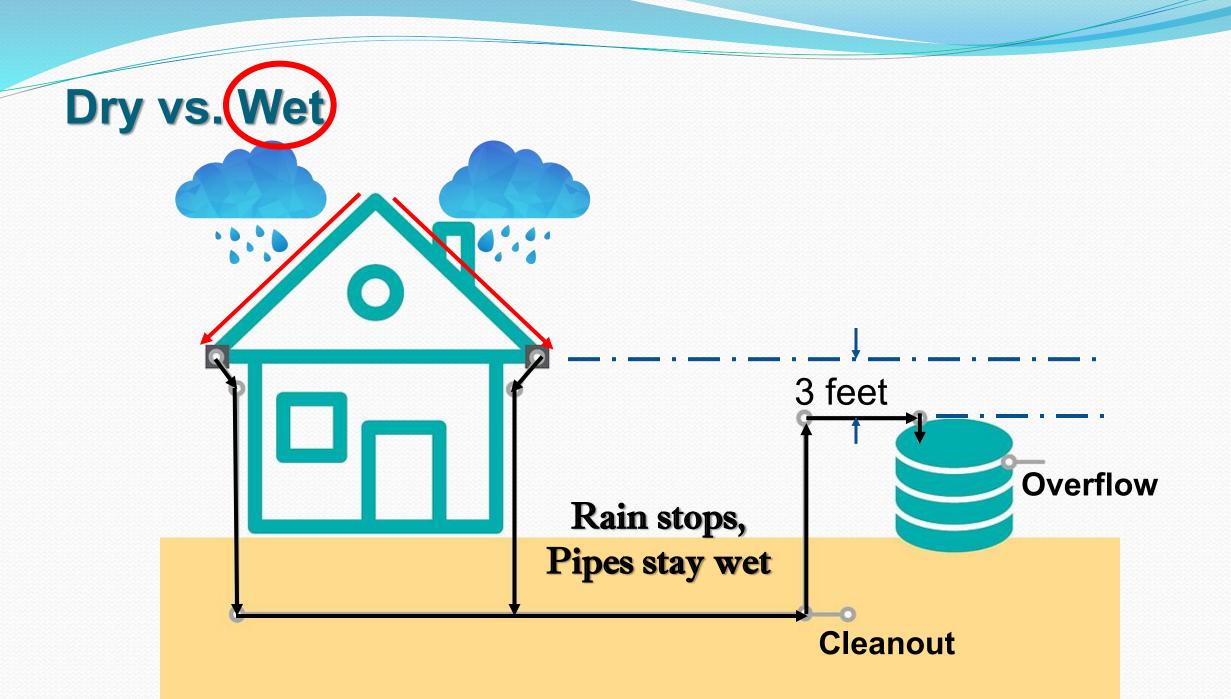


Source - Roof Footprint Sq Ft



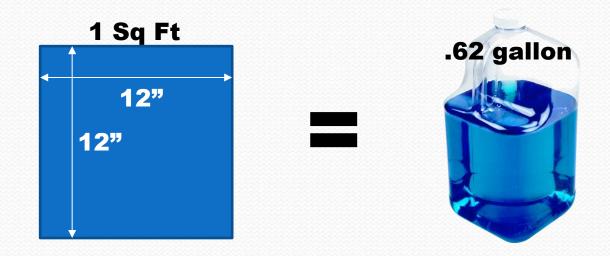
Dry vs. Wet



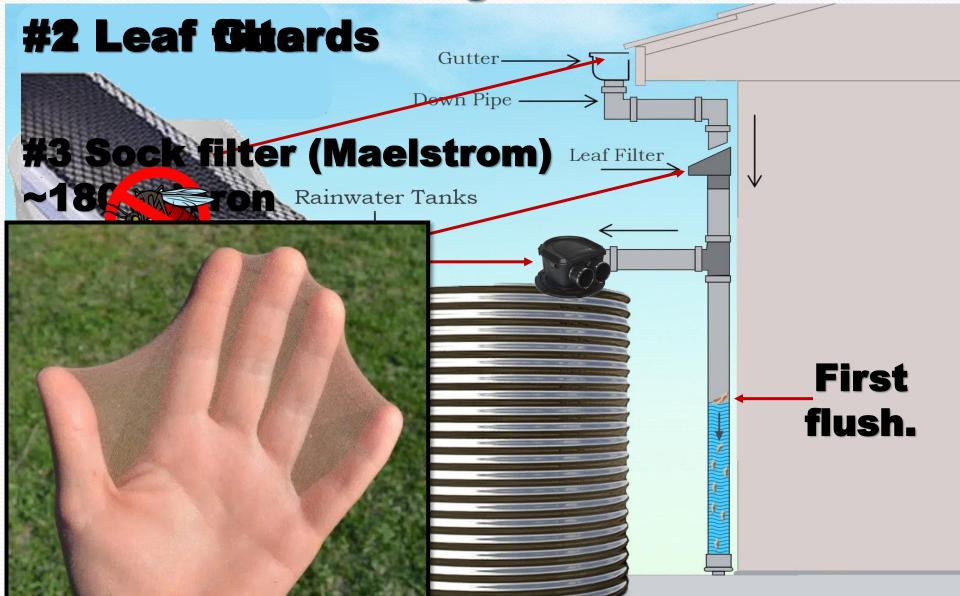


How Much Can I Collect?

- .62 gal per square foot per 1" rain
- 1" of rain on 1,000 sq ft roof
 - \bullet 1,000 x .62 = 620 gal
- 620 gal x 34" per year = 21,080 gal/yr.

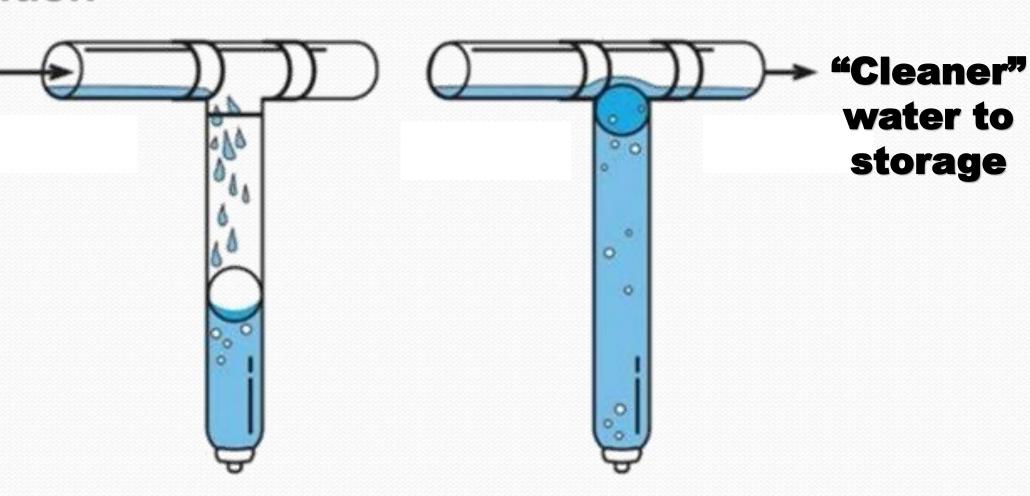


Pre-tank Screening



First Flush

"Dirty"
water
from
roof



Often Undersized
20 gal per 1000 sq ft



Often Undersized
20 gal per 1000 sq ft

Maintenance chore



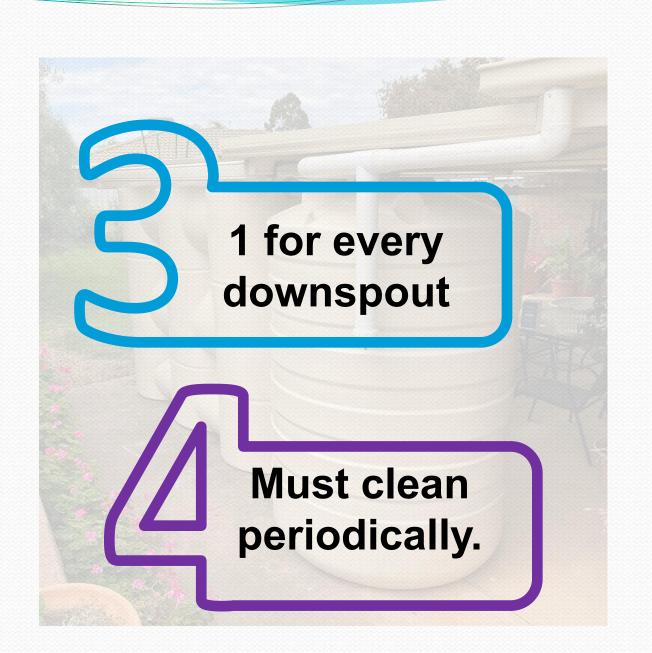
Often Undersized
20 gal per 1000 sq ft

Maintenance chore



Often Undersized
20 gal per 1000 sq ft

Maintenance chore





Rain Storage Containers

Barrels, polyethylene, fiberglass, wood,

concrete, or metal

Water i

8.36







Post-tank Filtration – For Animals and Landscapes



Post-tank Filtration – For Potable



Post-tank Filtration – For Potable



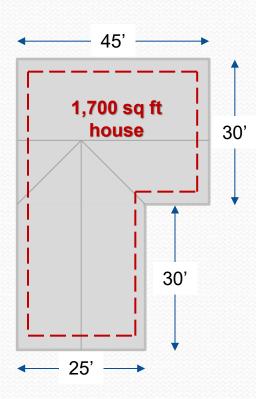
From tank



Easy Rule of Thumb – Ballpark Figure

- Home square feet plus 20%
- \bullet 1,700 sq ft x 1.2 = 2,040

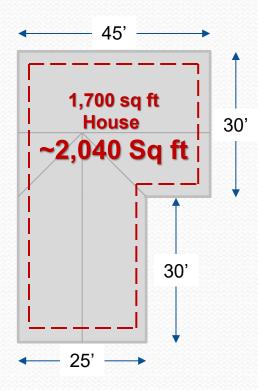




Calculate Supply



- 1" rain
 - \bullet 2,040 x .62 = 1,265 gal
- 34" per year
 - \bullet 1,265 x 34 = 43,010 gal.

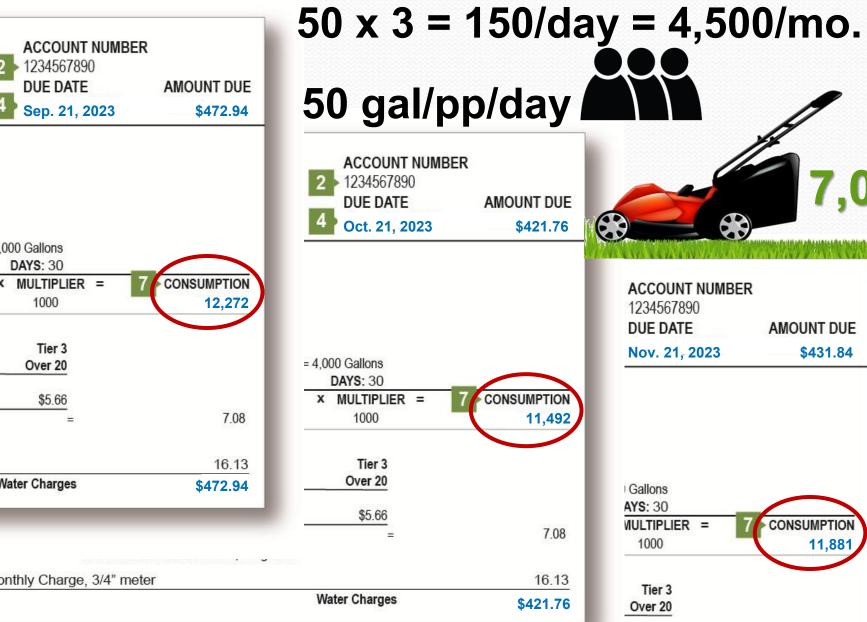


Demand & Tank – Indoor Use

- # people x 50 gal per day
 - $3 \times 50 = 150$ gal per day
 - 150 gal x 30 days = 4,500 gal per month
- How much drought reserve?
 - 3 months
 - \bullet 4,500 x 3 = 13,500 gal
- Storage tank(s) needed
 - 15,000 gal.

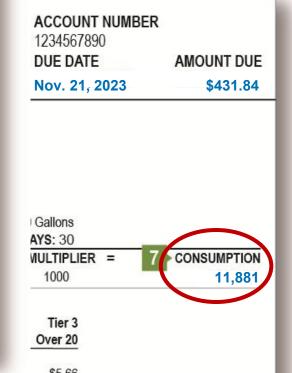


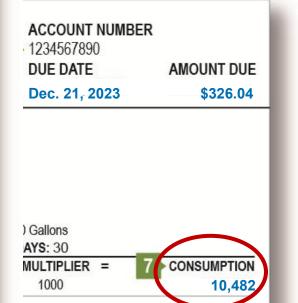
Demand & Tank





12,272 11,492 11,881 10,482 Ave. = 11,532







 $15 \times 25 = 375 \times .62 = 232.5 \times 3.5$ "/wk x 4 = 3,256 gal/mo



Grainger & Sunn

Rain Bees Harvesting Consultants



Rain Bees

>> Call us: Larry - 210.286.8050

Steven - 903.452.0801

Our services are always free and we welcome questions anytime.

When it rains ... we store

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Calculators

To save you a little time, we have compiled this selection of calculators to help you determine specifics regarding your rain harvesting system.

Disclaimer:

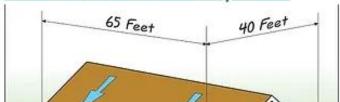
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Calculate Pipe Volume



Calculate Rain Capture



Calculate Tank Volume









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Writings

Gardening

Sources

FAQs

Contact

Category	Source or Service	Company	Contact	Address	Phone	Email or Website	Remarks
Consultants	Rain Harvesting Consultant	Master Gardeners	Dr. Steven Grainger	130 Stallion Springs Dr. Fischer, TX 78623	903.452.0801	jstevengrainger@gmail.com SaveWater@comalmg.com	Consults without charge
	Rain Harvesting Consultant	(CTGCD)	Dr. Larry Sunn	475 Brand Rd. Bulverde TX 78163	210.286.8050	texsunn@gmail.com RainBees.com	Consults without charge
	Rain Harvesting Consultant	Rain Bee	Chuch McCullum	1150 Whispering Water Dr, Spring Branch, TX 78070	301.642.3400		Consults without charge
	Drip Irrigation Consultant	Master Gardeners	Richard Vonder Embse	31273 Longhorn Trail, Bulverde, TX 78163	936.520.7275 830.438.1025	<u>Vicki.vonderembse</u> @yahoo.com	Drip irrigation systems; no cost consulting
Filters	Maelstrom filters, Leaf Eater Rain Head for Downspouts	Home Steader	Coy Clark	7901 N. Kickapoo Shawnee, OK 74804	405.481.9216	coy@unitliner.com https://www.home-steader.com/	Jami Johnston, Admin Asst, 405.481.8007
	UV filters, particulate filters	Raines Water Service	Terry Raines	471 Limestone Lane, Driftwood, TX 78619	512.466.4319	info@raineswaterharvest.com	
	Complete systems, Pioneer metal tanks	Rainwater Equipment	Jim Wood		817.246.4567	Jim@rainwaterequipment.com	
	Atlas Nano & Viqua UV Whole house filter systems	Tanks A lot	Jesse Beavers Danny Aldrete	39332 IH 10 West, Boerne, TX 78006	830-331-7330	danny@tanksalottx.com Jesse@tanksalottx.com	Replacement filters as well
Excavation & Installation	Specializes in poly tank installation excavation, trenchind, piping	Set tanks, excavation, trenching, piping	Eric Herman	249 Rogers Rd., Bulverde, TX 78163	210.760.4435	eric.hermann1@gmail.com	
	A & E Construction	full tank installation	Tony		830.708.0654		
Pipe	Stainless steel pipe fittings, HDPE pipe & fittings, Stainless PEX fittings	Raines Water Service	Terry Raines	471 Limestone Lane, Driftwood, TX 78619	512.466.4319	info@raineswaterharvest.com	
	Rain pipe supplier	Austin Pipe & Supply			512.477.4640		
	Rain pipe supplier	Gicon Pumps & Equipment		Schertz	210.654.8900		
	ADS Double Wall Drain Pipe	Tanks A lot	Jesse Beavers Danny Aldrete	39333 IH 10 West, Boerne, TX 78006	830-331-7331	danny©tanksalotts.com Jesse©tanksalotts.com	Culverts or large scale drainage projects
	Walrus pumps	Raines Water Service	Terry Raines	471 Limestone Lane, Driftwood, TX 78619	512.466.4319	info@raineswaterharvest.com	
	Grundfus pumps	Tanks-a-Lot	Jessie (owner), Bob Watt	Boerne	930.331.7330 210.882.9566	robert@tanksalottx.com	
Pumps		Gicon Pumps &			210.654.8900		

Questions?











Dr. Steven Grainger 903.452.0801



Dr. Larry Sunn 210.286.8050

How Much Water to Produce it?



10 gallons

35 gallons

66 gallons

265 gallons

635 gallons

2,000 Gallons per day