

**The Villa Caliche
Rainwater Collection
Dripping Springs, TX**

Fall 2012



Overview: Our house is designed to incorporate rainwater collection as the "sole source" (no well or "city" water) of all domestic water for our "normal" American Family of four. If we run out (during drought), drinking water is simply ordered from a local hauler, trucked-in and stored in the same tanks (about \$85/2,000 gals). Systematically, we are just like many other homes collecting rainwater in our neighborhood and Hill Country. There are lots of others doing "sole source" systems who can serve as comparative sources of info.

I am an architect & designed/engineered our system myself (it's not rocket science - gravity, tanks, piping, and a few pumps and filters) using Richard Heiniken's (Tank Town; Dripping Springs) book Rainwater Collection for the Mechanically Challenged.

Rainwater System Characteristics:

- **Sole Source:** rainwater collection system (no well or "city" water)
- **Storage:** (2) x 10,000 gallon fiberglass tanks = 20,000 gallons total storage
- **Typical Harvest Rate:** is 1,000 to 1,200 (max 1,500) gals/inch of rain (36" annual average rainfall yields 36,000 to 40,000+ gals/yr.)
- **Roof Area:** is 2,794 sq ft (metal roof) with 6 inch half-round gutters
- **Pressure Pump:** simple "ranch" duty 3/4 hp w/80 gal. pressure tank
- **Purification:** (5) levels- roof washer w/ leaf strainer basket and 30 micron mineral wool filters ("upstream" of storage tanks); then (downstream of pumps) replaceable, cartridge-type 8 micron sediment filter and 3 micron activated charcoal filters; finally a full-flow, food-service grade ultraviolet lamp (most expensive part).

City Lights Design Alliance

P.O. Box 1166

Dripping Springs, Texas 78620

512-264-3031

Water Use Profile & Costs:

- **Water Use:** Family of 4: about 30 gal/person/day (3,500 gals/mo avg or about 42,000 gals/yr.) This use profile has held steady for the last 5-7 years
 - Early on we used less: 20 gal/person/day (2,400 gals/mo). We were very careful!
 - Our yard is completely native and requires less watering. (Ask if you want a list of plants!)
- **Typical American Family:** use = 100 gal/person/day!!!
 - Landscaping 40 – 60% of water used on irrigated "lawn" & landscape
- **Annual Costs:** about \$321/yr – includes:
 - Supplemental water purchases: 24 deliveries of 2,000 gal. over 11 years at a total of \$1,886 or \$171/yr
 - Filters and UV lamp: about \$100/yr
 - Tank cleaning of interior once every 6 yr averages to \$50/year
- **Sustainability:** 90% over (11) years, based on % of water purchased:
 - 48,000 gal purchased/462,000 gal used = 10.4%
- **Water Quality:** Excellent, compared to typical hard water: no lime build up (same appliances for 11 years); no water softening treatment.

For those considering rainwater harvesting, I would say go for it, definitely! It's the absolute best water (quality). However, there are some particular issues as to how the system is set up:

- **Aesthetics:** "Right-sized" tanks are huge and "hard to hide"; thus a big element for site planning and architectural character. Choose wisely and design carefully. Burying tanks and integrating with architecture is possible but expensive. Junipers (cedar trees) are a great screen and don't cost anything.
- **Plumbing:** Vertical elevation of tanks relative to house gutters is critical and effects maintenance issues. Ideally, tanks should be set far enough downhill and inlets placed low enough to allow trunk lines to completely clear by gravity. This is called a "dry system." Otherwise a "P-Trap" effect occurs that adds to upkeep and maintenance. If this is not possible, there are ways around it (pump tank).
- **Maintenance:** Is not "zero," in fact, keeping up with roof washers and filters is part of the deal, and whoever maintains the system has to be willing to "confront" the things (organics, bugs) that get into the gutters. It is not a "plug and play" situation and requires diligent upkeep and tending for optimal use (which is part of the engagement with natural systems). For me, rainwater chores have become a ritual, a part of the natural "event." My kids watch Doppler Radar and know where their water comes from - they are rainwater "snobs". Maintenance may be an issue for those considering this water source; some may get into it and enjoy it, others may find it icky and distasteful; others may have "people" to help keep up with this.

Keenan E. Smith, AIA

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