

# Residential Rain Water Catchment Systems

## *Useful Information*

- ◆ 2.31 feet in elevation = 1 psi
- ◆ 1 foot elevation = 0.43 psi
- ◆ 1000 sq ft of roof = 623 gallons/1" rain
- ◆ *National average indoor usage gallons/person/day: 40 (shower: 8.8; faucets: 10.8; toilets: 8.2; clothes washers: 10; dishwashers: 0.7; other domestic: 1.6. NOTE: Leaks and baths are not included)*
- ◆ 1 gallon water = 8.34 pounds
- ◆ 7.48 gallons in 1 cubic foot
- ◆ Average annual rainfall for your area

## Basics

*Calculate* collection: Multiply the impermeable collection area's square footage by the rainfall in inches, then take that total and multiply it by 0.623. The answer is total collected gallons for that amount of rainfall. However, be conservative and use 90% of the total to account for losses. For example:

- ◆ Roof area = 1,000 sq ft
- ◆ Annual Rainfall = 15 inches
- ◆ Roof area x annual rainfall = 1,000 sq ft x 15 inches x 0.623 x 0.90
- ◆ = 8,410 gallons/year

*Cover* all openings of containers with screening to keep out mosquitoes. You can also use a microbial insecticide, specific to mosquito larvae, which contains *Bacillus thuringiensis israelensis (Bti)*. Easy to find in gardening catalogues and in garden departments, often called "Mosquito Dunks".

*Have* an opaque container to keep algae from growing. If you need to paint a translucent container (the white plastic ones are not opaque), tinted rubberized roof paint works well.

*Pressure:* Using the information above, you need to decide if you are going to use gravity or pressurize your water. Drip systems and soaker hoses need 15- 20 psi to work correctly. Methods of irrigation like basin flooding or "T-Tape" (a drip system that functions on 2-10 psi) can be used for low pressure systems. For more information on "T- Tape", search the web. If you are using containerized water for indoor use, you will need to pressurize the water.

*Considerations:* Before you set up a water catchment system, ask yourself a few questions:

- What will it be used for?
- Do I want a simple system or a complex system? (see back of sheet)
- Will I want the option to expand my system?
- How much can be collected?
- Where will the tank overflow go?
- If I want potable water, is the roof material suitable?
- Where can the containers be located? Above or below ground?
- Can the containers serve several purposes where they are located- like serving as shade for the garden, a windbreak or the edge of a structure?
- Do I need to hide the containers for aesthetic purposes or neighborhood restrictions?
- How will the water get from the roof to the container and to the end use area?
- Will the system be gravity fed, or will it need a pump?

## **System Components**

### *Simple Gravity Fed System (for non-potable uses)*

Gutters

Screen

Container

Barrels: Available at feed stores, car washes, web sites

Larger Containers: Potable plastic, metal, fiberglass, ferrocement, septic tanks, corrugated metal pipes (culverts), or? Available at feed stores, tank supply companies (look in phone books), septic system suppliers, building suppliers

Tank Overflow Drain

Distribution system (gravity flow to landscape)

### ***Complex Systems (for potable and non--potable uses)***

*For potable uses: Research **carefully** all materials used that come into contact with the rainwater.  
The more maintenance your system receives, the higher the quality of water.*

Roof Material: For potable use, metal roofs are preferred that do not contain lead, zinc coatings or copper. Preferred metal roof materials include stainless steel, galvanized steel and galvalume steel. Some other roof materials are acceptable. If coatings are needed, there are roof coating products that are NSF approved.

Gutters

Screen

First Wash System

Large Container (see above)

Tank Overflow Drain

Plumbing from tank to pressurizing system: Use Schedule 40 PVC pipe, not copper or ABS

Pump from tank to filters/Pressure tank (minimum 30 psi for inside use)

Pumps available at plumbing supply houses, RV dealers

Filters: For sediment

Final water treatment: Ultraviolet light

**Prepared by the University of Arizona's**  
***Water Wise Program at 520- 458- 8278 x 2139 or x 2150.***

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