

BE WATER WISE



Rainwater Conservation

Rain Barrel Construction Workshop
For York County Parks & Recreation Nixon Park
By York County Conservation District

Content

- ❑ Who should conserve water?
- ❑ What is rainwater conservation?
- ❑ Where to use less water
- ❑ When should rainwater be conserved?
- ❑ How to build and use a rainwater conservation barrel
- ❑ Why rainwater conservation is important

Who should conserve water?

- Anybody who depends on water use outdoors



What is rainwater conservation?



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- Rather than allowing rainwater runoff to flow down your driveway or into storm sewers, capture this resource for later reuse or at least allow it to gradually soak into the ground and recharge the groundwater. One way is to divert water from your downspouts into a "*rainwater conservation barrel*".

YCCD

Where rainwater can be conserved

- Almost any impervious surface
 - House
 - Garage
 - Porch
 - Shed
 - Deck



When rainwater can be conserved



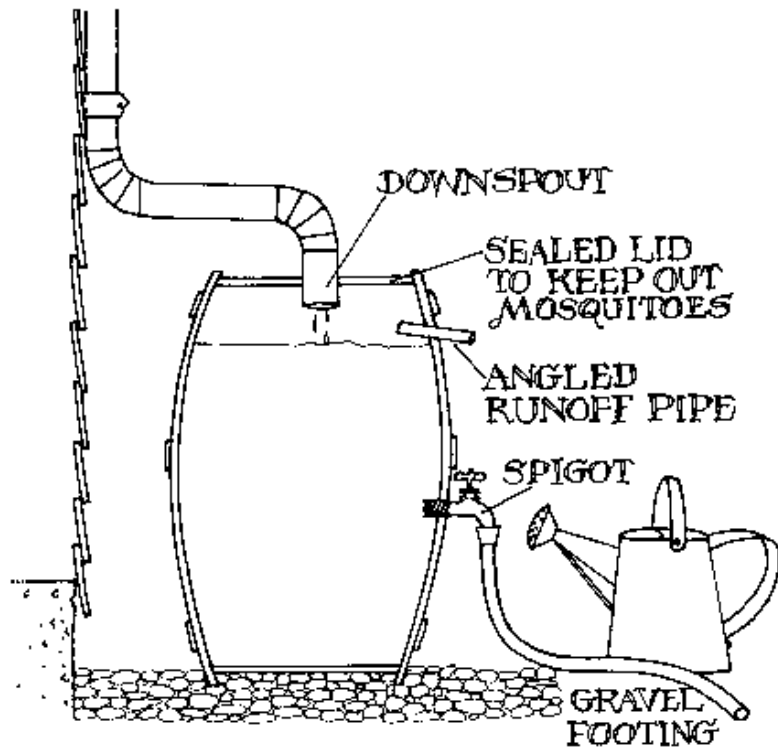
- ❑ Residential irrigation can account for up to 40% of domestic water consumption
- ❑ Water conservation measures such as rain barrels can be used to reduce the demand on your water and sewer systems, and save money, especially during the hot summer months.

How to build a rain barrel

- What is a rain barrel?
 - Effective & efficient tool for conserving rainwater and managing stormwater runoff
 - Low technology
 - Low-cost
 - Easy maintenance



How to build a rain barrel (cont.)



- Typical rain barrel design includes:
 - Hole at the top to allow for flow from a downspout
 - Sealed lid
 - Overflow pipe
 - Spigot at or near the bottom of the barrel
 - Cleanout (optional)

How to build a rain barrel (cont.)

- The required capacity of a rain barrel is a function of the rooftop surface area that drains into it



How to build a rain barrel (cont.)

- Calculate the roof top water yield for any given rainfall, using the following general equation:
 - $V = A2 \times R \times 0.90 \times 7.5 \text{ gals./ ft.}^3$ where:
 - V = volume of rain barrel (gallons)
 - $A2$ = surface area roof (square feet)
 - R = rainfall (feet)
 - 0.90 = losses to system (no units)
 - 7.5 = conversion factor (gallons per cubic foot)

How to build a rain barrel (cont.)



□ Example:

- Roof area = 1800 ft²
- Downspouts 3 =
1800/3 = 600 ft² each

$$600 \text{ ft.}^2 \times 0.0083 \text{ ft. (0.10 inch)} \times 0.90 \times 7.5 \text{ gallons/ft.}^3 \\ = 33.615 \text{ gallons}$$

- General rule of thumb:
0.10 inch of rainfall on
a 1000 square foot roof
will yield approximately
60 gallons

How to build a rain barrel (cont.)



- ▣ Rain barrels can be big to provide larger volumes of storage

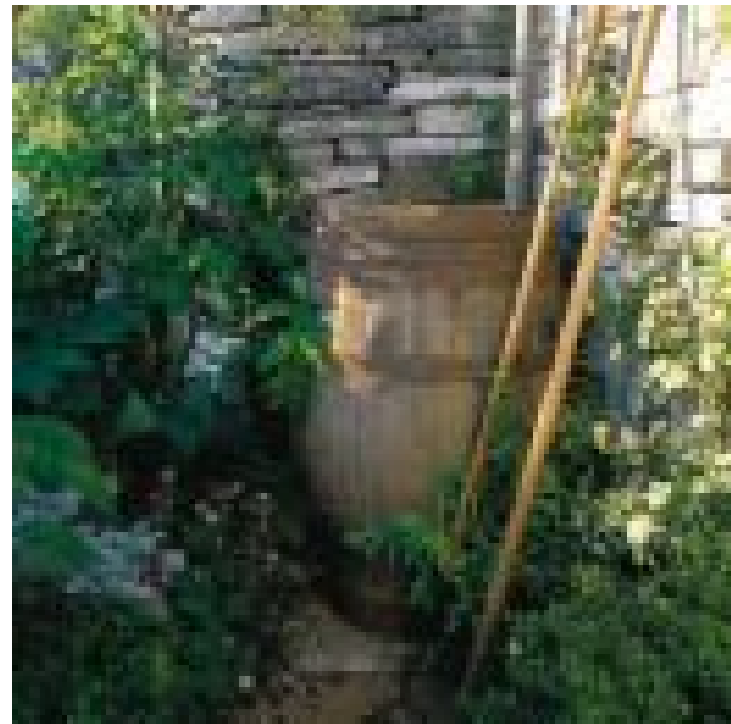
How to build a rain barrel (cont.)



- ▣ Rain barrels can be connected in series to provide larger volumes of storage

How to build a rain barrel (cont.)

- ❑ Basic components:
 - Barrel (metal, plastic, wood) is recommended to be at least 55 gallons
 - Top should be sealed or removable to exclude mosquitoes and allow easy access for cleaning
 - Fixtures spigot and overflow outlet (wood, metal, plastic)
 - Connection to the downspout



How to build a rain barrel (cont.)



- Additional considerations:
 - Safety: rain barrels may pose an immediate danger to life and health of pets and small children
 - Ease of inspection, cleaning and maintenance
 - Vector control (sealed or accessible for treatment)
 - Gutter screens to prevent leaves and twigs from entering rain barrel
 - Aesthetic appeal

How to build a rain barrel (cont.)

□ Typical cost:

- *Rain barrel* \$10
- *Gutter connector* \$2
- *Bung port adaptor* \$1
- *Hose bibb valve* \$1.50
- *Hose clamp* \$0.50
- Total \$15



How to build a rain barrel (cont.)

□ Regulations

- While rainwater catchment systems are largely unregulated in many areas, local regulations may require that plumbing and health codes are be met



How to build a rain barrel (cont.)

□ Materials:

- 1, 55-gal barrel
- 1, 2" ABS Bung Port Adaptor
- 1, ½" Hose Bibb (inlet male IPS; outlet ¾" hose)
- 1, Flexible plastic gutter elbow (2"x3")
- 1, 3" Hose clamp

□ Tools:

- 1, Measuring tape
- 1, Marking pencil
- 1, Electric drill
- 1, ¾" Keyhole drill bit

How to build a rain barrel (cont.)

STEP 1: Bung port adaptor installation

- On barrel top locate fine and coarse threaded bung port openings
- Screw 2" bung port adaptor into opening fine-threaded opening



Rain Barrel Construction (cont.)

2. Drill hole(s) & attach fittings

- Lay barrel on it's side with bung port adaptor on the bottom (closest to ground)
- On the top-side of barrel measure 3" up from bottom and mark
- Drill $\frac{3}{4}$ " hole in the barrel for the $\frac{1}{2}$ " spigot to connect your garden house to the barrel
- Slide hose clamp over flexible elbow and both over bung port adaptor
- Tighten hose clamp snug



Rain Barrel Construction (cont.)

3. *Mark & cut down spout at the proper height*

- Level ground of chosen spot
- Place rain barrel on 1-2 course of concrete blocks and mark to edge of flexible elbow on down spout
- Cut down spout 1-2" below mark
- Slide flexible elbow over down spout and rest on concrete block



Rain Barrel Construction (cont.)



4. *End product*

- Remove remaining bung port cap on top of barrel and cover it with a small screen for overflow
- Or, if overflow is desired, then drill 1" hole 3" below top of barrel on side of choice and screw in plastic hose adaptor
- Place ½" wire-cloth screen in rain gutter

Rain Barrel Maintenance

- Maintenance requirements for rain barrels are minimal and consist only of regular inspection of the unit as a whole and any of its constituent parts and accessories. The following components should be routinely inspected, at least twice a year, and either repaired or replaced as needed.

Rain Barrel Maintenance

- *Roof catchment*, to ensure that no particulate matter or other parts of the roof are entering the gutter and downspout to the rain barrel.



Rain Barrel Maintenance



- *Gutters*, to ensure that no leaks or obstructions are occurring.
- *Downspouts*, also to assure that no leaks or obstructions are occurring.

Rain Barrel Maintenance

- ❑ *Entrance at rain barrel*, to ensure that there are no obstructions and/or leaks occurring.
- ❑ *Rain barrel*, to check for potential leaks, including barrel top and seal.



Rain Barrel Maintenance



- *Runoff / overflow pipe*, to check that overflow is draining in non-erosive manner.
- *Spigot*, to ensure that it is functioning correctly.

Rain Barrel Maintenance

- ❑ *Any accessories*, such as rain diverter, soaker hose, linking kit, and additional guttering.
- ❑ *Winter months* either maintain barrel volume at ½ capacity or completely and leave spigot open



Rain Barrel Benefits



- Rain barrels are low-cost water conservation devices that can be used to reduce runoff volume and, for smaller storm events, delay and reduce the peak runoff flow rates.

Rain Barrel Benefits

- By storing and diverting runoff from impervious areas such as roofs, these devices reduce the undesirable impacts of runoff that would otherwise flow swiftly into receiving waters and contribute to flooding and erosion problems.



Rain Barrel Benefits



- Rain barrels can provide a source of free water for flower and vegetable gardens and landscapes, free of most sediment and dissolved salts.



Rain Barrel Benefits

More About Water Conservation

- Mid-Atlantic Ecological Landscapes
“MAEscapes”, www.maescapes.org
- PA Dept. of Environmental Protection
www.dep.state.pa.us “Water Resources”
- Watershed Alliance of York, Inc.
www.watershedsyork.org
- York County Conservation District
www.yorkccd.org, Watershed Program

Be Water Wise!

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