

*Fact Sheet on Residential On-Site Stormwater Storage Structures*

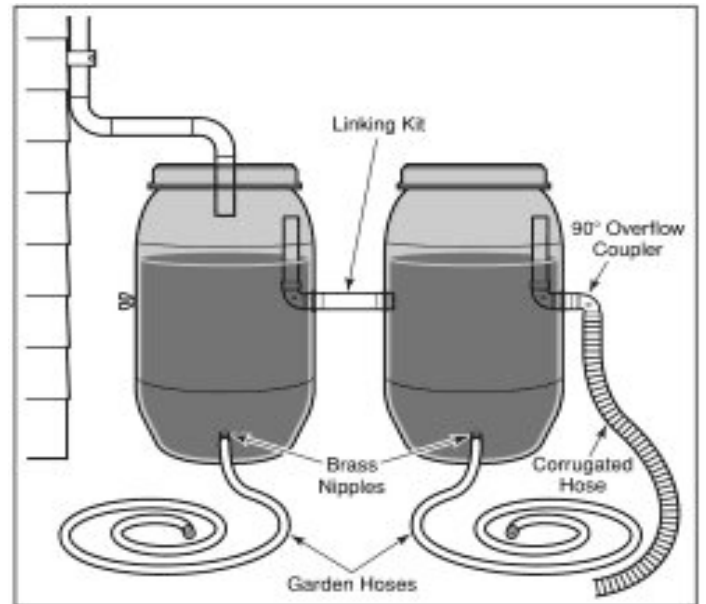
Onsite stormwater storage structures can include rain barrels, cisterns, bladders or other storage devices as approved by the Northeast Ohio Regional Sewer District. These structures collect and capture rainwater from roofs that would otherwise be drained directly to the stormwater system or streams. Onsite stormwater storage structures can be used to water plants, trees, or lawns during dryer periods.

**Rain Barrel:** A rain barrel is composed of a 40-55 gallon barrel or drum, a spigot, a vinyl hose, downspout diverter, and an overflow mechanism. A screen opening or downspout diverter can be used to keep debris and insects out. Overflow mechanisms allow the rainwater to either be diverted to the stormwater system or landscaping features when the barrel is full. These overflow mechanisms may include diverters that allow water to flow back into the downspout or flexible pipe that allows overflows to be diverted to landscaped areas.

Saving water not only helps protect the environment it saves money and energy because of the decreased demand for treated tap water. Check with your County Soil and Water Conservation District for instructions on how to make and install a rain barrel. Rain barrels can also be purchased through several online suppliers. Ensure your rain barrel will meet the requirements below.



1. Example of Rain Barrel with downspout diverter that directs overflow back to the downspout



2. Example of Rain Barrel with Overflow to yard

**Cistern:** Cisterns are similar to rain barrels in function but hold larger quantities of water. They can be installed underground, at ground level, or elevated depending on the site and space constraints of the property. A cistern should be constructed out of reinforced concrete, galvanized steel, or plastic, and should have a smooth interior surfaces, be watertight, have enclosed lids and be sized according to the installation standards below to manage the proper amount of runoff.



3. Example of Cistern (Cleveland Metroparks Zoo)

**Rain Bladder:** A rain bladder is a flexible modular tank designed to be installed into the tightest locations and can be completely hidden from view. They can be installed under the sub-floor of a home, gazebo, and under decking.



4. Nylex Bladder Tank under a deck

**Installation Standards:** To obtain an individual residential property credit for onsite stormwater storage the following standards and requirements must be met:

1. 75% of the property's roof area is properly connected to rain barrels or other approved storage devices that provide at least 40 gallons of storage per downspout,  
- or -  
storage structures must be sized to hold the runoff from at least 50% of the property's roof area during a 1-inch rainfall event.

$$V = \frac{1}{2} \times A \times 0.6225 \text{ gallons/feet}^2$$

Where:

V = volume of storage structure in gallons

A = surface area of roof in square feet

0.6225 = conversion factor (gallons per cubic foot per inch of rain)

**Example**

A 500 gallon cistern would provide runoff storage from a 1,600 square foot rooftop for a 1 inch rainfall.

$$A = 1,600 \text{ square feet}$$

$$\frac{1}{2} \times 1,600 \times 0.6225 = 498 \text{ gallons}$$

2. Onsite stormwater storage must be completed in such a way that does not provide mosquito breeding grounds, such as making sure rain barrels are covered with a lid or screen that prevents mosquitoes from entering the storage structure.
3. Onsite stormwater storage must be equipped with an overflow or bypass mechanism to divert rainwater to the storm drainage systems when storage structure is full. These mechanisms must not cause erosion, property damage or overflow onto a neighboring property.
4. Onsite stormwater storage must be completely drained in no less than 24 hours and no longer than 4 days after each rainfall event.
5. Rainwater from the onsite stormwater storage structures must be applied to on-site vegetation and should not discharge from the property. Longer drainage periods may be acceptable if the storage structure is larger than the minimum size required for credit.
6. All on-site stormwater storage structures must meet the requirements of member community building and zoning codes for downspout disconnection, landscaping, property setbacks, and other applicable local codes.

### **Maintenance Guidelines – Rain Barrel, Bladder, and Cistern**

1. Clean your gutters regularly to reduce debris.
2. Clear off any screens as necessary.
3. Periodically check any hoses associated with the storage structure to clear any debris.
4. To winterize, disconnect the downspout and return the downspout to its original configuration. Remove the hoses, mesh screen and store them. Make sure to drain the container, to prevent it from freezing and cracking. If possible, store it upside down, so no water or materials will be able to enter.
5. For cisterns, leave the outflow spigot fully open during frost/freezing periods and unhook the drain hose about twice a year to clean out any compacted sediment.

### **Citations**

Picture 2: <http://www.watershedactivities.com/projects/spring/rainbarl.html>

Picture 4: <http://www.duralirrigation.com.au/onlinestore/index.cfm?NavigationID=953>