

## RAIN GARDENS

Most rainfall events in New Jersey are less than two inches in 24 hours. When addressing water quality, the standard to use is 1.25-inches of rain over two hours.

A rain garden is designed by Rutgers to hold approximately 3.5 inches of rainfall over 24 hours, designing the garden for additional storage and infiltration over 24 to 48 hours.

The rain garden is designed to fill with runoff and infiltrate that volume within 24 to 48 hours. The designed infiltration time provides a factor of safety to prevent the creation of mosquito habitat<sup>1</sup>.

<sup>1</sup>Rector, P., T. Duckworth and C.C. Obropta (2012). Rain Gardens and Mosquitoes. Rutgers Fact Sheet 1175. <http://njaes.rutgers.edu/pubs/publications.asp?pid=FS1175>



## COSTS

- The cost of installation was minimal as the DPW staff excavated the site
- The cost of the plants are approximately \$1,400
- The cost of the engineering design for the RCE Water Resources Program as part of the Troy Brook grant and oversight of the project was \$880
- Volunteers from the Rutgers Master Gardeners of Morris County and the Mountain Lakes Garden Club will be responsible for the planting

Brochure created by Pat Rector, Rutgers Cooperative Extension Environmental and Resource Management Agent for Morris and Somerset Counties and Christopher C. Obropta, Ph.D., PE., Associate Extension Specialist in Water Resources

## MAINTENANCE

- *Keep the ponding area, inflow, outflow, gutters, and drain pipes clear of any leaves and debris*
- *Too much accumulation of leaves and debris can create clogs, which will decrease infiltration and can decrease the proper outflow during large storm events.*
- *The rain garden serves the purpose of capturing and filtering runoff, so sediment will tend to accumulate within the garden. It will need to be removed with a shovel occasionally. This is a sign of success! This sediment would have been directed straight to the local waterways without your efforts!*

For more information please contact:

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

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## RAIN GARDENS Greening the Department of Public Works (DPW) Facility in the Troy Brook Watershed



The Mountain Lakes Department of Public Works (DPW) facility is managing a portion of stormwater runoff by allowing the runoff from the roof of the main building to drain to a rain garden. The rain garden captures, filters, and treats stormwater runoff prior to entering the storm sewer system.

Implementation Project completed by  
Rutgers Cooperative Extension Water Resources Program  
and Rutgers Cooperative Extension of Morris County under  
a 319(h) Grant from the  
NJ Department of Environmental Protection

## THE SITUATION



Mountain Lakes Department of Public Works Building, Mountain Lakes, Morris County, NJ.  
Photo courtesy of Jessica Brown, RCE Water Resources Program

The Township of Mountain Lakes is situated within the Troy Brook watershed. The Mountain Lakes DPW facility is participating in reducing stormwater runoff to the Troy Brook. Addressing the Mountain Lakes DPW yard stormwater runoff can assist in improving water quality in the Troy Brook since this facility is upstream of the Parsippany-Troy Hills DPW. The majority of runoff from this site flows into a healthy, wooded area on the northern area of the parcel naturally allowing for disconnection, treatment, and infiltration. The primary source of runoff entering the storm sewer system is from the roof of the DPW building. Intercepting the runoff with a rain garden is one opportunity for managing the stormwater onsite. Mountain Lakes has been identified in the Troy Brook Regional Stormwater Plan as an area where recharge should be encouraged.

## THE SOLUTION



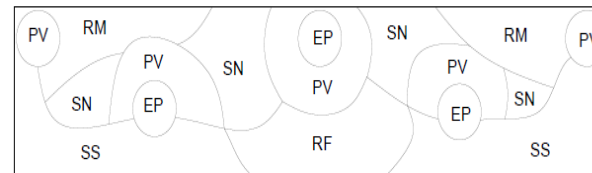
Excavation was conducted by the staff of the Mountain Lakes DPW allowing for significant cost savings.  
Photo courtesy of Jessica Brown, RCE Water Resources Program

Rain gardens are shallow, landscaped depressions that capture roof, driveway, or parking lot runoff from frequent small storm events. The captured stormwater is allowed to slowly seep into the ground, recharging the groundwater, while the soil and plants filter out pollutants. This infiltration reduces the amount and velocity of stormwater that enters the stream. The rain garden was installed in the back of the building to allow for the disconnection of the roof runoff.

## RAIN GARDENS

BOTANICAL NAME	COMMON NAME
<i>PANICUM VIRGATUM</i> 'SHENANDOAH'	SWITCHGRASS
<i>EUPATORIUM PURPUREUM</i>	JOE PYE WEED
<i>SYMPHYOTRICUM NOVAE-ANGLIAE</i>	NEW ENGLAND ASTER (PURPLE)
<i>SCHIZACHYRIUM SCOPARIUM</i>	LITTLE BLUESTEM
<i>RUDBECKIA MAXIMA</i>	LARGE CONEFLOWER
<i>RUDBECKIA FULGIDA</i>	BLACK EYED SUSAN

Plants for the Mountain Lakes DPW Rain Garden



The Rutgers Cooperative Extension Water Resources Program utilized funding from Section 319(h) of the Clean Water Act grant from the NJ Department of Environmental Protection to design a rain garden to treat roof runoff from the DPW facility building in Mountain Lakes.

**Impervious surfaces are defined as any surface that has been covered with a layer of material so that it is highly resistant to infiltration by water. Examples include but are not limited to paved roadways, paved parking areas, building roofs and greenhouses.**

## RAIN GARDENS

The roof drainage to the rain garden is 1,820 ft<sup>2</sup>, and the rain garden treats a large part of the impervious foot print of this facility. The driveways and buildings were the only impervious surfaces that provided runoff that reached the stream. This rain garden captures the runoff from the entire roof.



Hay was placed over the excavated garden to maintain the soil and prevent erosion until planting in the spring.  
Photo credit Jessica Brown. RCE Water Resources Program

Rain gardens are great models of a cost-effective, stormwater best management practice (BMP). Rain gardens can remove pollutants such as fecal coliform, phosphorus, nitrogen, sediment, and some heavy metals.

Construction of the rain garden (shown above) was completed in the fall of 2014. Planting of the rain garden was planned for spring 2015.

For updates and further information please visit our website at [www.water.rutgers.edu](http://www.water.rutgers.edu).