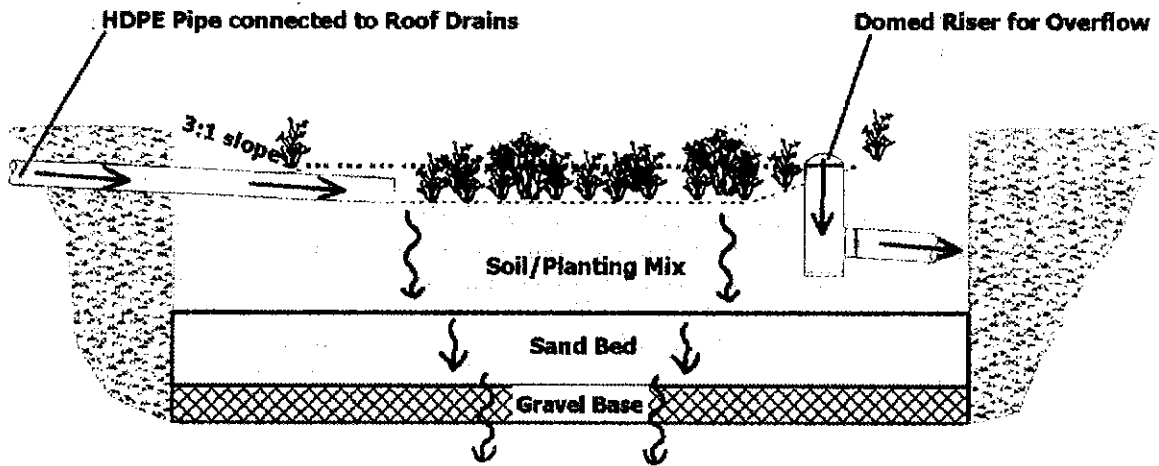


# RAIN GARDEN / BIORETENTION BED



Sand Bed and Gravel Base lined with Geotextile Fabric



PSU / Centre County Visitor Center  
raingarden soon after construction



PSU / Centre County Visitor Center raingarden in full bloom



Raingarden at the Penn Alexander School in West Philadelphia



Domed riser for overflow

## What is a Rain Garden / Bioretention Area?

A Rain Garden – Bioretention area is form of a man made ecosystem – a type of constructed bio-filter that is a vital part of the natural hydrological cycle, something we all learned about in elementary school!!! The rain garden collects and stores excess rain water from roofs of buildings or from driveways or parking lots – thus preventing this run-off from polluting our streams and causing flooding and erosion of stream banks. The rain garden uses natural means to store and process and filter and purify this water before infiltrating it into the ground water table below the rain garden bioretention area. This ground water feeds our springs and streams.

## Why is it important?

Infiltration of rain water using rain gardens – bioretention – infiltration swales or trenches or various forms of pervious paving (pervious asphalt paving, pervious concrete paving, gravel pavers, grass pavers, and brick or formed concrete pavers) all help to divert water from our overloaded municipal storm water systems – and instead – emulate the forest or meadow ecosystem – and associated natural hydrological cycle that existed before your home or office or local shopping center was built. The rain garden filters, purifies and stores rain water – it supports plant life and habitat and it recharges our ground water tables – which in turn feed our natural springs (seen to your right-near STATION 16) This clean purified rain water that leaves the rain garden – bioretention area – provides these springs and streams with clear clean pure pollution free water which is essential to providing base flows in our streams and rivers. Maintaining seasonal base flows – is obviously beneficial to wildlife and all plants and animals and the habitats that they live in. Water is the giver of Life – a rain garden man made way of emulating natures own water filtration process – which is part of the natural hydrological cycle. Current Best Management Practices (BMP's) for storm water management in residential, commercial and institutional development have been focused on hard engineered systems with extensive and costly concrete curbs, gutters, catch basins, manholes, concrete channels and buried concrete storm water pipes – and also in many cases large costly storm water detention basins - those unsightly craters or “dry-ponds” you see around housing developments and shopping centers and highway interchanges which fill up with water after a hard rain. Infiltration based Low Impact Development (LID) storm water strategies like the rain garden – bioretention area are a key to solving many storm water and non-point source pollution problems we have here in Pennsylvania and across the US. LID type storm water technologies are better than the previous hard engineered concrete BMPs because unlike these older BMP's – rain gardens, bioretention areas and other LID storm water technologies do the following: 1) they hold and store collected rain water more effectively and for a longer period of time; 2) they promote evapo-transpiration through plants and trees which cools the air and the environment around our towns and cities; 3) “rain-garden” bioretention areas support new plant life and create a habitat for animals and plants and helpful insects; 4) when designed properly - they DO NOT foster the growth of mosquitoes and other nuisance bugs as there is no standing water – except for a very small amount (about 6 inches) for just a few hours after a very heavy rain; 5) they filter and purify the rain water – and remove pollutants such as motor oil and antifreeze and other heavy metals that come from run-off from parking lots and driveways; 6) The plants and bio-mass, mulch and soil and plants and bugs and microbes and other critters in the rain garden bioretention area actually process these pollutants – and help break them down naturally – thus preventing these pollutants from entering our vital ground water tables and from going straight into our streams rivers and bays and oceans.) 7) rain-garden bioretention areas also very effectively help us to recharge our local ground water tables – which are a primary source of our drinking water, and water for businesses and industry which are vital to all Pennsylvanians! Rain Gardens prevent non-point-source pollutants from being piped directly into our streams which is what current BMP's do. 8) they help replenish ground water tables – with clean purified water that then feeds our natural springs which in turn feed our streams and rivers, ponds, lakes and bays. Preserving the natural hydrological cycle using a rain garden/bioretention area is a way of copying the service nature provided us with before we started to develop our land!

## How do I build a Rain-garden/Bioretention area for my home or office?

See the diagram on the other side of this flyer (Special thanks to Tom Cahill and Associates of West Chester PA for helping to design the Rain Garden / Bioretention Display found at STATION 21 at the DCNR/PA Fish and Boat Commission / PA Game Commission display at the 2003 PA Flower and Garden Show at the PA Farm Show complex in Harrisburg, PA on March 14-16, 2003. There are various strategies for making the potting mix that is the heart (and middle layer) of the rain garden - bioretention area. The potting mix for the DCNR exhibit is the same mix that is being used for the construction at several rain gardens being installed at State Parks throughout the Commonwealth. This mix – as seen at STATION 21 is ¼ soil (from your site), ¼ sand, ¼ shredded leaf mulch (or organic compost from your back-yard compost pile) and ¼ fine shredded wood chips (shredded limbs, Christmas trees, etc which you can usually find at the local county landfill or recycling center)

## Where to go for more information:

Go to The Low Impact Development Center's Website at [www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org) for great general design details, and see two helpful brochures “Builders Guide to Low Impact Development” and “Municipal Guide to Low Impact Development”. (Both downloadable at no cost in pdf format) Also contact your local Landscape Architect for proper plant selection – plants must meet three requirements – they must be local indigenous species, they must be drought and disease resistant, and they must also tolerate having “wet feet” on occasion (plants must be mold and fungus resistant as the rain garden area will be both wet and dry at different times of the year! If Designing a large rain garden – bioretention area or a pervious parking area – please consult a qualified civil engineer with experience in designing infiltration LID technologies. For addition information see also: [www.goprincegeorgescounty.com](http://www.goprincegeorgescounty.com); [www.toolbase.org](http://www.toolbase.org); and [www.epa.gov/owow/nps/urban.html](http://www.epa.gov/owow/nps/urban.html)