

## Storm Water Management Program

*In May of 2001 the governmental agencies that make up ALOA joined together to address EPA's upcoming Phase II requirements.*

*This brochure is one of a series of publications regarding storm water issues in Lee County.*

*The series is produced by the ALOA Storm Water Advisory Panel and is intended to protect, maintain, and restore the chemical, physical, and biological integrity of local waters in order to enhance the quality of life for our citizens.*



*Cleaner streams provide a benefit to all.*

## Alternative Stormwater Treatment Technologies



### CONTACT INFORMATION

For more information regarding your community's storm water program please contact the following agencies:

City of Auburn – Department of Public Works  
334-501-3000

<http://www.auburnalabama.org/pubworks/phase2stormwater.html>

Lee County – County Engineer  
334-745-9792  
[www.leeco.us](http://www.leeco.us)

City of Opelika – Department of Public Works  
334-705-5400  
[www.opelika.org](http://www.opelika.org)

Auburn University – Risk Management and Safety  
334-844-4870  
[www.auburn.edu/administration/rms/](http://www.auburn.edu/administration/rms/)



## STORM WATER MANAGEMENT PROGRAM

## Alternative Stormwater Treatment Technologies



*“Local Citizen Groups and Government Working Together for Clean Water”*

## WHY ALTERNATIVE STORMWATER TREATMENT TECHNOLOGIES?

As our population increases, the effects of urbanization lead to increased amounts of stormwater runoff. As regulatory agencies issue Total Maximum Daily Loads (TMDLs) and regulatory limits on discharges into our streams, the need for more efficient, more effective stormwater treatment technologies has arisen. This brochure will briefly discuss three of these technologies: bioretention/rain gardens, stormwater wetlands and pervious pavements.

### WHAT IS BIORETENTION/RAIN GARDENS?

The bioretention process was developed in the early 1990's by the Prince George's County, Maryland, Department of Environmental Resources. Bioretention/rain gardens utilize soils and herbaceous plants to remove pollutants from stormwater runoff. They also act as a floodplain by dissipating the velocity of the runoff and thereby causing suspended solids to settle out of the water.

Bioretention is ideal for installation in parking lot islands and areas where aesthetics are a concern.

Water is typically held in the rain garden for a period of one to two days. Studies have shown that rain gardens/bioretention areas are effective at removing as much as 90% of the suspended solids and 70-80% of the nutrients existing in the stormwater to be treated.



### ADVANTAGES OF BIORETENTION/RAIN GARDENS

Rain gardens/bioretention areas have many advantages including:

- Aids in decreasing stream-bank erosion
- Helps recharge groundwater aquifers
- Protects lakes/streams from pollutants and sediment
- Provides shade and wind-breaks
- Absorbs Noise



Alex City Rain Garden

### DISADVANTAGES OF BIORETENTION/RAIN GARDENS

Although bioretention is an effective treatment technology, there are a few disadvantages/misapplications of this BMP:

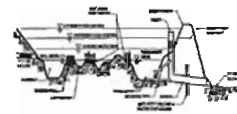
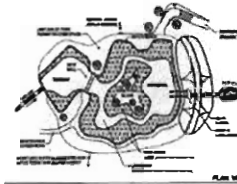
- Not applicable in shallow water table locations
- Not effective in cold climates
- Periodic maintenance is needed



### WHAT ARE STORMWATER WETLANDS?

Stormwater wetlands are constructed wetlands and are considered one of the most effective BMPs at reducing pollutant levels in stormwater runoff. Stormwater wetlands utilize the processes of sedimentation, filtration, adsorption and denitrification to treat and remove pollutants. Stormwater wetlands typically consist of:

- **Forebay**—entrance of wetland where sedimentation occurs
- **Deep Pool**—Designed to retain water during droughts in order to maintain fish habitat
- **Shallow Water Area**—Area that typically stays wet and provides the conditions to establish *denitrification*. Wetland vegetation thrives.
- **Shallow Land Area**—Area that is typically dry except during storms when it is submerged
- **Upland/Non-Floodable Areas**—Area that is never submerged, even during storm events. Provides observation points for educational purposes
- **Outlet**—Structure that provides a release mechanism of the detained stormwater



### DISADVANTAGES OF STORMWATER WETLANDS

Stormwater wetlands have the following misapplications/disadvantages:

- Requires more land than other BMPs

- Potential mosquito habitat due to water being detained
- Land Cost
- Deeper areas can present a danger to children



### WHAT IS PERVIOUS PAVEMENT?

Pervious pavement is an alternative to typical pavement. Unlike conventional paving, which is impervious and provides no infiltration, pervious pavement/concrete filters stormwater runoff and greatly reduces the amount of runoff. Pervious pavement typically consists of a paver layer (3-4" thick), a sand bedding area (2") and a gravel layer (3-6").

Studies have shown that pervious pavement is an effective solution at removing suspended solids (80-95% removal), nutrients (70-85% removal) and metals (98% removal). Pervious pavements are ideal for driveways, walkways and parking lots but may not be effective in high traffic areas.



Auburn University Arboretum

### ADVANTAGES OF PERVIOUS PAVEMENT

Pervious pavements have many advantages over typical asphalt paving including:

- Helps recharge groundwater aquifers
- Can eliminate the need for detention ponds, swales, etc.
- Can lower overall project cost by creating more efficient land use.



There are many resources available that provide design and construction guidelines on the BMPs listed above as well as many other stormwater treatment options. For more information contact your local government office or the Alabama Cooperative Extension System.