

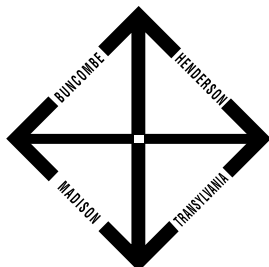
# Maintaining Wet Detention Ponds



## Stormwater Fact Sheet No. 7

This fact sheet is part of a series for local government officials and citizens on stormwater runoff problems and control strategies. The series covers:

1. Stormwater Problems And Impacts
2. Control Principles And Practices
3. Rules And Regulations
4. Local Program Elements And Funding Alternatives
5. Municipal Pollution Prevention Planning
6. Managing Stormwater In Small Communities: How To Get Started
7. Maintaining Wet Detention Ponds
8. Plan Early For Stormwater In Your New Development
9. How Citizens Can Help Control Stormwater Pollution



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## Introduction

Stormwater runoff is a significant source of water pollution in urbanizing areas. To address this problem, the State of North Carolina and some local governments have adopted programs that

require or encourage the use of wet detention ponds to treat stormwater runoff.

Studies have shown that wet detention ponds can

be very

effective in removing certain pollutants including sediment, some nutrients and heavy metals.

If properly designed, constructed and maintained, wet ponds will not only protect water quality, but can reduce peak stormwater flows and can be an attractive feature of a development.



*Ponds Can Be Attractive Features Within A Development.*

Photo Courtesy of Sea Grant Program.

## Why Some Ponds Fail

Studies have shown that poor operation and maintenance is the leading cause of pond failure. Poor maintenance can also create nuisance odors, insects, algae blooms and unsightly areas. Detention ponds can fail for several reasons including:

- Improper design and siting
- Poor vegetation management
- Inlets and outlets clogged by sediment or trash and debris
- Storage capacity of pond reduced due to sediment accumulation
- Failed sideslopes or dam
- Inadequate access for maintenance

## Maintenance Considerations

Routine maintenance is vital to the proper operation of a wet basin. Every pond is different and its maintenance needs will depend on the size, type and condition of the watershed that contributes runoff to the pond. For example, a pond serving a large commercial district with several land disturbing activities may require more maintenance than one serving a small established neighborhood. Maintenance should always include minimizing erosion problems and pollutant introduction in the contributing watershed.

The location of the pond in the development may have a bearing on how well it's maintained. People have more favorable impressions of wet ponds, are less likely to throw trash in them and are more likely to clean and maintain basins when they are provided a prominent position in the development.

## The O&M Program

An effective Operation and Maintenance Program requires:

1. A good O&M Plan that specifies what O&M actions are needed and when they will be performed;
2. The identification of responsible parties; and
3. Adequate funding for maintenance activities.

In general, maintenance programs should contain the following components:

### Components of a Maintenance Program

#### Routine

- Inspection
- Vegetation Management
- Debris/Litter Control
- Mechanical Components Maintenance

#### Non-Routine

- Bank Stabilization
- Sediment Removal
- Outlet Structure Maintenance/Replacement

## Routine Maintenance

### ☐ Inspections

Frequent inspections by the responsible party are required to ensure proper operation. An inspection should be made after major rainfall events to check for any obstructions or damage and to remove accumulated trash and debris. Other inspections should be made according to the responsible party's operation and maintenance plan required by the state or local government.

At a minimum, an inspection should include review of the following:

#### Minimum Inspection Checklist

- Obstructions of the inlet or outlet devices by trash and debris
- Excessive erosion or sedimentation around the basin
- Cracking or settling of the dam
- Deterioration of inlet or outlet pipes
- Condition of the emergency spillway
- Stability of sideslopes
- Up and downstream channel conditions
- Woody vegetation in or on the dam

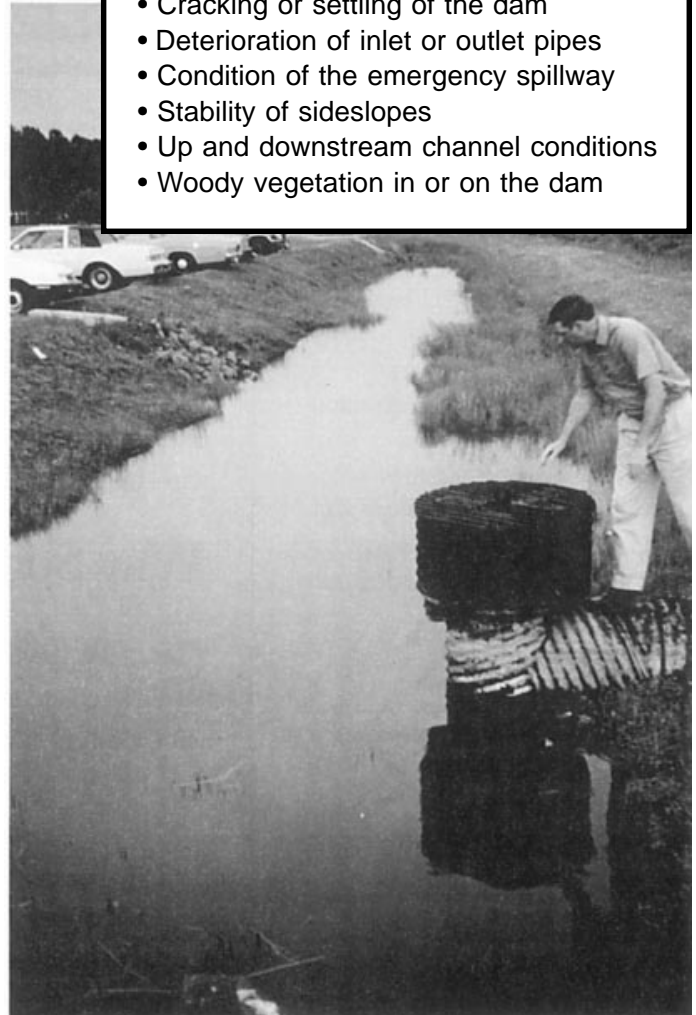


Photo Courtesy of DEM.

### ❑ Vegetation Management

Vegetation in and around the pond must be mowed or maintained on a regular basis to prevent any erosion or aesthetic problems. Cattails, and other indigenous wetland plants are encouraged along the pond perimeter for pollutant uptake and breakdown, but must be removed when they cover the entire pond surface. Use of fertilizers and pesticides in or around ponds should be minimized to avoid their entry into the pond and downstream waters.

### ❑ Debris and Litter Removal

Debris and litter control checks for inlet, outlet and orifice obstructions should be made after every runoff producing rainfall. Side slopes and the collection system (i.e. catch basins, piping and grassed swales) also need litter and debris removal on a regular basis.

### ❑ Mechanical Components Maintenance

The inspector should check the operation of any valves, pumps, fence gates, locks or mechanical components on a regular basis and make immediate repairs or replacements.

## Non Routine Maintenance

### ❑ Bank Stabilization

It is important to keep an effective ground cover on all vegetated areas. This helps to prevent erosion, stabilize banks and prevent any unnecessary sediment from entering the basin. These areas should be reseeded or stabilized immediately.

### ❑ Sediment Removal

Every six months, any accumulated sediment should be removed from the bottom of the outlet structure and the pond depth should be checked at various points. If depth is reduced to 75% of original design depth, sediment should be removed to the design depth to ensure adequate storage capacity. In general, sediment removal will be required every 5 to 15 years. A forebay placed upstream or incorporated into the upper portion of the pond enhances the sedimentation process



Photo courtesy of Guilford County, NC, Planning Department

*Maintenance Includes Periodic Sediment Removal.*

and sediment and debris removal, and lowers maintenance costs. Onsite disposal of the sediment is the cheapest alternative. Some communities allow its use as landfill cover.

### ❑ Outlet Maintenance/Replacement

Eventually the outlet structure or other structural components will need repair or replacement.

## Who's Responsible?

Designation of a responsible party(ies) is important to assure proper inspection and maintenance. Maintenance is usually the responsibility of the property owner or a homeowners association. In some cases, a local government may accept maintenance responsibility and charge a fee for this service. Under the NC Water Supply Watershed Protection Act, local governments must inspect wet ponds at least annually to ensure proper maintenance by the responsible party.

## Costs & Funding

Estimated annual operation and maintenance costs for wet basins are 3% to 5% of construction costs. Mowing and sediment removal are the most costly activities.

Responsible parties should establish a maintenance fund and assess annual fees on appropriate property/home owners. Local governments can establish stormwater utilities or charge inspection fees to carry out their maintenance responsibilities.

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# For More Information

## ☐ Reference Documents

- An Overview of Wet Detention Pond Design, 1994, NC DEM - (919) 733-5083.
- Stormwater Management Guidance Manual, 1994, NC Cooperative Extension Service and NC DEHNR - (919) 515-3723.

## ☐ Contacts

- NC DEM Stormwater Management Group - (919) 733-5083, and DEM Regional Offices.
- Contact the appropriate local government.

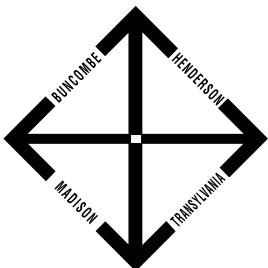
### DEM REGIONAL OFFICES

<p>Winston-Salem Regional Office 585 Woughtown St. Winston-Salem, NC 27107 (910) 771-4600</p>	<p>Raleigh Regional Office 3800 Barrett Dr. Raleigh, NC 27611 (919) 571-4700</p>	<p>Washington Regional Office 1424 Carolina Avenue Washington, NC 27889 (919) 946-6481</p>
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<p>Asheville Regional Office 59 Woodfin Place Asheville, NC 28801 (704) 251-6208</p>	<p>Mooresville Regional Office 919 North Main Street Mooresville, NC 28115 (704) 663-1699</p>	<p>Fayetteville Regional Office Wachovia Building, Suite 714 Fayetteville, NC 28301 (910) 486-1541</p>
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<p>Wilmington Regional Office 127 Cardinal Drive Extension Wilmington, NC 28405-3845 (910) 395-3900</p>
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References: N. Virginia Planning District Commission, *Maintaining BMPs: A Guidebook for Private Owners and Operators in N. Virginia.*



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