



## **OVERVIEW**

Watershed Protection Regulations were adopted in Guilford County to protect designated drinking water supply reservoirs from pollutants caused by storm water run-off. Permanent Wet Detention Ponds are a best management practice used to conform to the watershed protection regulations. It is the responsibility of the property owner to maintain these run-off control structures so maximum efficiency of the pond will continue.

The Guilford County Planning Department is required to inspect all permanent run-off control structures in its jurisdiction on an annual basis to ensure the ponds are being properly maintained. After each annual inspection, an inspection report and a cover letter will be mailed to the responsible party if any maintenance/repairs are required.

Any maintenance or repair needs noted on the inspection report must be completed within 90 days of the dated report. Any enforcement by this Department to gain compliance for these structures will be issued through a Notice of Violation.

The following is a summary of typical problems an owner may encounter with a water quality pond.

## **MAINTENANCE ITEM**

### ***PROBLEM: HEAVY COVER ON THE POND SURFACE BY VEGETATION***

**CAUSE: ALGAE:** Algae on surface waters can usually be linked to an over abundance of nitrogen and phosphorus. The most common causes of excess nitrogen and phosphorus are over fertilization of lawns or failing septic systems.

**SOLUTION:** Avoid over fertilization of lawns. This is best accomplished by obtaining a soil analysis through the Cooperative Extension Service and following the recommended application rate. Triploid grass carp can also be stocked in the pond to alleviate algae. Contact the NC Wildlife Resources Commission for further details. The Guilford County Environmental Health department will assist when failing septic systems occur.

### ***PROBLEM: RUTS ON THE POND'S SLOPES***

**CAUSE: EROSION:** Erosion is a natural process of wearing down any surface and is a common maintenance problem of water quality ponds. Most erosion occurs when concentrated water flows over unvegetated surfaces.

**SOLUTION:** Establish a sturdy sod, free of weeds and brush.

Erosion control matting as well as other erosion control products can assist in establishing grass cover. See manufacturer's recommendations for further details. A properly maintained grass cover (not to exceed six inches in height) is the best method of prevention for erosion. Grass should be mowed at least once a month during the growing season and clippings should not be discharged into the pond.

### ***PROBLEM: DIFFICULT ACCESS TO POND***

**CAUSE:** A poorly maintained easement from pond to road.

**SOLUTION:** There should always be a minimum 20' wide unobstructed access easement to pond from road. This path shall be kept mowed and clear from trash and debris.

**PROBLEM: FISH KILLS**

**CAUSE:** Silt and fertilizer are a potential source of disease to fish, resulting in kills.

**SOLUTION:** Stocking fish in a water quality pond is permitted but difficult to sustain. Only ponds larger than an acre in surface area should be considered for stocking. Although certain fish types can discourage insect habitations one should contact the NC Wildlife Resources Commission for complete details. Avoid over fertilization and keep pond banks vegetated to avoid erosion & siltation.

**PROBLEM: HOLES IN DAM EMBANKMENT**

**CAUSE: BURROWING ANIMALS:** Rodents such as the groundhog, muskrat, and beaver will often gravitate to a water quality pond. Groundhogs and muskrats can burrow into a dam, weakening the embankment, thus leading to seepage. Early detection is necessary to prevent major damage to the structure and structures downstream.

**SOLUTION:** A well maintained dense grass cover free of trees and brush is the best prevention of such rodents. To remove any of these rodents you should contact the North Carolina Wildlife Resources Commission.

**PROBLEM: WET, MUCKY AREAS ON DOWNSTREAM SLOPE OF DAM**

**CAUSE: DAM SEEPAGE:** Seepage will naturally occur at the base of a dam, as water from the pond seeks a path of least resistance. Larger amounts of seepage can be attributed to voids in the dam caused by decaying vegetation, burrowing rodents, or improper construction.

**SOLUTION:** Remove shrubs, bushes and trees less than six inches in diameter from both slopes of the dam and maintain a good grass cover. This will prevent roots from compromising the structural integrity of the dam and alleviate cover for burrowing rodents. If seepage persists contact a professional engineer for further assistance. Beware if the seepage is discolored. This is a sign of soil being transported by the water, a possible early sign of dam failure.

**PROBLEM: POND LEVEL HIGHER THAN NORMAL**

**CAUSE: HIGH WATER LEVELS:** Unusually high water levels will result after any rain event. For water levels to remain high can be the result of an obstruction in the ponds release device.

**SOLUTION:** Remove debris and obstructions from the riser's water quality hole and trash rack. These orifices should be checked after any heavy rain to ensure unobstructed water release from the pond.

**PROBLEM: POND WON'T HOLD WATER**

**CAUSE: LOW WATER LEVELS:** Constant low water levels may be the result of drought conditions, seepage, an opened drain valve, or malfunctioning riser/barrel materials.

**SOLUTION:** The drain valve should be closed at all times except for times when repairs are being made to the pond. Riser/barrel materials should be checked for rust and broken sections. Contact a professional engineer if materials are suspect. If seepage is a problem refer to maintenance item "seepage" for solution.

**PROBLEM: TREES & BUSHES ON THE DAM AND SPILLWAY**

**CAUSE:** Trees and bushes grow naturally but can pose many problems to a wet detention pond. The woody vegetation can die or decay and leave voids in the in any embankment and impede the flow of water through the spillway system.

**SOLUTION:** Trees (less than six inches in diameter) and bushes should not be allowed on or in

any part of a dam, dissipator pads, emergency spillways, pond surface or inlet channels. Removing the vegetation is necessary to a properly functioning device.

**PROBLEM: CRACKS IN CONCRETE STRUCTURES**

*CAUSE:* There are many specific technical reasons for concrete failures.

*SOLUTION:* All concrete structures including the spillway should be inspected every two months for cracking, seepage, settlement, and undermining. Small cracks should not be of concern, but cracks larger than 1/8" in width could indicate a serious problem. Serious problems such as repairs of settlement, seepage, undermining, or large cracks should be discussed with an engineer

**PROBLEM: POND IS DISCOLORED AND MURKY**

*CAUSE: MURKY POND WATER:* Murky or cloudy water in a pond is most likely the result of sediment entering the pond. Even though the ponds are designed to catch sediment, it is important to monitor the amounts of sediment that are being stored. A pond with large amounts of sediment can cause the pond to malfunction thus releasing the sediment into the water supply.

Cloudiness or a slight discoloration in water might be the result of turbidity. Turbidity is the suspension of extremely fine particles from clay soils. As the particles settle out the pond should clear up in a short time.

*SOLUTION:* Preventing erosion upstream and around the pond is the most proactive measure of ensuring a properly functioning pond. Even with properly vegetated slopes small amounts of sediment will enter the pond. Removal of sediment will be necessary when design volume has been exceeded. Consult with an engineer for removal procedures.

**PROBLEM: MOSQUITOES**

*CAUSE:* Mosquitoes lay eggs in places that retain rainwater for at least a week. The Asian Tiger Mosquito is most common to this area and will only travel a distance of 100 yards from breeding sites.

*SOLUTION:* Mowing grass and weeds will control mosquito populations, along with stocking ponds with specific fish types such as Gambusia.

**FOR ASSISTANCE**

The Watershed Protection/Stormwater Management Section Department for Guilford County is available in the Planning and Development Department to answer specific questions regarding the watershed ordinances and development.