

### **Pond Maintenance**

To ensure peak performance of retention basins, a healthy aquatic environment should exist. A healthy aquatic ecosystem typically requires little maintenance. Excess nutrients are a common problem with retention ponds. An indicator of excess nutrients is excessive algae growth in the permanent pool of a retention basin. In most cases, growth of more desirable aquatic and semi-aquatic vegetation in and around the permanent pool will help to utilize nutrients in the pond, thus deterring the growth of algae and other nuisance vegetation.



An algae bloom is an indicator of excessive nutrients.

### **Bank Stabilization**

It is very important to prevent erosion of the banks and bottom of detention basins (dry ponds) and the visible banks of retention ponds. The easiest way to do this is to keep groundcover healthy. Areas of bare soil will erode quickly, clogging the basin with soil and threatening its integrity. Any bare areas should be re-seeded and stabilized as quickly as possible.

The roots of woody growth, such as young trees and shrubs, can also destabilize embankments. Consistent maintenance can control any stray seedlings that take root in an embankment. Woody growth away from the embankment does not generally pose a threat to the stability of the embankment and can play an important role in the health of the vegetative environment. For ease of maintenance, trees and shrubs should be planted outside maintenance and access areas.

### **Sediment Removal**

Sediment removal, or dredging, may be a maintenance option for you to consider. Dredging removes the layer of highly enriched materials from the lake's bottom. Removing this nutrient "bank" prevents phosphorus from releasing back into the water column and consequently being discharged into receiving waters during the next storm. This also helps lower nutrient concentrations in the lake, thus decreasing nuisance algae blooms. Dredging can help to improve water quality by deepening the BMP, providing additional storage capacity. But, deeper is not always better! Consult a professional for optimum BMP depth.

#### **Sediment Removal in Retention and Detention Basins**

Sediment will accumulate in a BMP and will eventually need to be removed, but facilities vary so much that there are no hard and fast rules about when and how. For planning purposes, sediment removal should be considered on the following intervals:

- Extended detention basins (dry ponds): every 2-10 years
- Retention basins (wet ponds): every 5 –15 years

Sediment removal is usually the largest single cost of BMP maintenance; therefore, it is best to plan ahead to allow for contractual negotiations, as well as adequate funding.

The sediment removed from your basin will require proper disposal. Typically, an onsite area or a site adjacent to the facility (but outside the floodplain) is set aside for the spoil. If such a disposal area is not set aside, transportation and landfill tipping fees can greatly increase the cost of sediment removal. Once the sediment is removed, the bottom of the basin and any disturbed areas need to be stabilized and revegetated or the facility will quickly clog and require sediment removal again.

Wet sediment is more difficult and expensive to remove than dry sediment. In some cases the entire basin can be drained and allowed to dry so that equipment can remove sediment from the bottom.

In other cases, where this is not practical, it may be necessary to remove sediment from a vantagepoint on the shoreline or by hydraulic dredging from the surface. This additional cost of sediment removal for a retention facility is partially offset by the longer interval between dredging cycles. Disposal of wet sediment is not allowed in many landfills, so the material often must be dried (dewatered) prior to disposal. This extra step adds to the cost and requires a place where wet material can be temporarily placed to dry.



Dredging helps lower nutrient concentrations in water.

### **Sediment Removal in Infiltration Trenches**

Infiltration facilities tend to clog more frequently than either detention or retention basins. Therefore, it is recommended that these facilities be inspected at least two to four times a year. Most infiltration trenches have a sediment trap or filter to remove some sediment before the stormwater enters the trench. Keeping this sediment filter clean is vital to ensuring the long-term performance of the infiltration trench.

This is especially critical for concentrated input facilities that use sediment traps. If the sediment trap is full, sediment-laden water will be conveyed into the trench. With dispersed input facilities, a clogged sediment barrier is indicated when water cannot flow into the trench and goes through the overflow channel. For any overflow condition, the observation well should be checked to determine the cause. If the trench remains filled with water after a rain event and causes regular overflow, then the aggregate stone should be excavated and the facility rebuilt.

The specific sediment removal procedure will depend on the manner in which the stormwater enters the facility. Concentrated input facilities will have some kind of in-line filter system or sediment trap. Clean-out procedures should be described in approved facility plans, as well as in any maintenance agreement. If there is any question on how routine sediment removal is to be performed for a given facility, the designing engineer or your local Public Works or Engineering Departments can make recommendations.

For typical trenches using dispersed input, routine sediment removal usually means removing the top 6 to 12 inches of filter gravel and replacing the filter cloth sediment barrier that covers the aggregate reservoir. A layer of clean filter gravel replaces the gravel removed. Any bare spots or damaged areas in the grass filter strip should be replaced with sod upon completion of the sediment removal procedure.

### **Who Should Carry Out the Maintenance?**

Before tackling any maintenance project, the first step is to contact your local Department of Public Works or Department of Engineering. When designing a maintenance program, safety, cost and effectiveness of the maintenance activities need to be balanced. Some activities, like mowing and litter removal, can be less expensive if done in-house.

It is usually worthwhile to hire professionals to detect problems early, when they are most cost effective to fix. This might include filling eroded areas, soil disturbing activities, grading, and sediment removal. If not performed properly, efforts may be wasted, and cause damage to the facility by excessive erosion. Be sure to contract with a reputable firm and ask for references and sites that you can check.