

BMP MAINTENANCE AND POLLUTION PREVENTION

7.1 Introduction

The purpose of this Chapter is to provide general information on inspection and maintenance requirements for stormwater quality best management practices (BMPs) and provide general information on pollution prevention on developed properties.

7.2 BMP Inspection and Maintenance

Proper maintenance of stormwater quality BMPs is one of the most important factors in the long-term performance and effectiveness of a Water Quality Management Plan. Property owners or homeowners associations are required to properly maintain BMPs located on private property for the life of the BMP, and therefore must execute protective covenants that include legally-binding inspection and maintenance requirements. The protective covenants are entitled “Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices”, and a blank copy is presented in Appendix F of this manual.

Effective, long-term operation and maintenance of BMPs requires a three-phased approach on the parts of the developer, property owner and local jurisdiction. These three phases are as follows.

- 1) Site Developer: In an effort to reduce maintenance requirements for each development, a developer or site designer should consider the maintenance requirements for each stormwater structural or non-structural BMP when designing a development. To this end, the local jurisdiction strongly encourages site designers to utilize non-structural BMPs and better site design practices to the maximum degree possible, thereby reducing the degree of stormwater maintenance that will be required for the property after construction. Non-structural controls, which are discussed in detail in Chapter 5, generally require very little (and often no) maintenance and can reduce the size of any structural BMPs needed to treat stormwater runoff quality. The developer and site designer should then choose, design and construct structural BMPs that have the lowest relative long-term maintenance requirements based upon the site constraints.

The developer and site design engineer are required to submit and certify Record Drawings of the new development or redevelopment that show the actual conditions of the developed site, including stormwater quality BMPs, after construction is completed. Along with the property's plat, these Record Drawings will serve as the basis for locating BMPs, vegetated buffers and WQv credit areas, and provide a baseline understanding of BMP design and construction that will be used for inspections and maintenance in the years to follow.

- 2) Property Owner: After construction, the property owner is responsible to inspect and maintain the BMPs, vegetated buffers, and WQv credit areas in accordance with the guidance provided in this manual. For more information on BMP inspection content, frequency and documentation, refer to the checklist for each BMP provided in Chapter 4 of this manual. Information on WQv credit areas is provided in Chapter 5, and vegetated buffer information is provided in Chapter 6.



- 3) **Local Jurisdiction:** Local stormwater quality management regulations give local jurisdictions the authority to perform periodic inspections of water quality BMPs, vegetated buffers and WQV credit areas in order to determine if these elements are being maintained in accordance with local regulations and policies. Corrective actions can be ordered or performed for elements that are determined to be improperly constructed or not maintained. The reader is referred to the local stormwater quality management regulations for more information on jurisdictional authority and penalties if corrective actions are warranted.

7.3 Pollution Prevention After Construction

As noted in Chapter 1, stormwater pollution, or non-point source pollution, comes from many different sources: active construction sites, agricultural practices, forestry practices, and urbanized areas. Some types of urban land uses contribute higher than normal pollutant loadings. Inherent with these types of land uses are the storage, use and/or production of higher amounts of solvents, oils, lubricants, fertilizers, grease, and/or bacteria. If traditional stormwater quality controls are installed in runoff discharges that carry higher pollutant levels, the controls are quickly overwhelmed and stormwater quality downstream suffers. Therefore, for such discharges, additional measures must be taken to protect local streams, rivers and lakes from these higher pollutant loadings.

Pollution prevention begins during active construction. However, pollution prevention must be practiced throughout the life of the site and is the responsibility of the property owner and business/activity operator. Pollution prevention activities should be tailored to capture typical pollutants from the land use activity occurring on the site. General guidance for land uses that are often identified as having a higher than normal pollutant potential is presented in the following paragraphs.

- **Vehicle maintenance, washing or storage facilities.** Pollution prevention activities for vehicle maintenance, washing, or storage land uses must focus on spill prevention and cleanup, oil and other fluid and material recycling, pre-treatment of wash water or runoff from maintenance areas, staff education on proper pollution prevention techniques, and customer education about the activities that are or are not acceptable on the premises. For businesses where vehicles will be stored, pollution prevention activities must also include routine inspection of the vehicles for leaks or discharges. Drip pans must be used to capture leaks and discharges until the vehicle can be maintained or fluids should be drained completely from vehicles that will remain unused. Discharges of wash water resulting from the hosing or cleaning of vehicles, equipment and/or facilities is considered an illegal non-stormwater discharge. Therefore, wash water must be prevented from entering the stormwater system. These activities could include blocking the stormwater system or diverting the wash water into a pre-treatment measure and then into the sanitary sewer system.
- **Recycling and salvage yard facilities.** Where the land use is a business that recycles or salvages vehicles or other equipment, the pollution prevention practices for that site should address draining the equipment of all fluids before storage. If the storage area is uncovered, pre-treatment controls are required to treat additional pollutants that could result from the storage or deterioration of the equipment or vehicles before the runoff discharges to traditional best management practices (BMPs), such as those discussed in Chapter 4.
- **Restaurants, grocery stores, and other food service facilities.** Grease and organic pollutants are pollutants that are typically encountered around restaurants, grocery stores, and other food service facilities. Pre-treatment to remove such pollutants prior to discharging to traditional BMPs is required, in order to prevent clogging of downstream BMPs and the stormwater system. As well, wash water from equipment and/or facility cleaning activities must either be discharged to the sanitary sewer or be pre-treated prior to discharging to a stormwater quality BMP.
- **Facilities that temporarily or permanently house animals outside.** Animal housing



facilities, such as veterinary clinics, boarding facilities, livestock stables, hatcheries and animal shelters, have the potential to deliver higher than normal bacterial loadings to the stormwater system. High counts of bacteria in streams and rivers can cause water quality impairments, but can also cause illnesses in people. Pollution prevention practices for these types of facilities must include pet waste management practices, such as collecting and properly disposing of pet waste at landfills or wastewater treatment facilities. Animal bedding should be removed when soiled and properly disposed. Wood shavings or chips must not be allowed to migrate into the stormwater system.

7.4 Sediment Disposal for Structural BMP Maintenance

Many of the structural BMPs (presented in detail in Chapter 4 of this manual) that are utilized to prevent stormwater pollutants from entering the waters of the state will accumulate sediment deposits over time and will require maintenance and cleaning to ensure that they continue to work at optimum efficiency. Depending on the characteristics of the drainage area to each structural BMP, there could be a wide nature of substances contained within the sediments. The appropriate sediment disposal method will depend on the type of contamination, if any, in the soil. Proper assessment and disposal of accumulated sediment is necessary to ensure that the sediment removed from structural BMPs does not cause discharge of pollutants to the environment. The text in this section shall be regarded as local jurisdictional policy for proper assessment and disposal of accumulated sediments that are removed from structural BMPs. (Note: the text below was adapted from the City of Knoxville Land Development Manual – Policy 11, June 2003.)

When properly designed, structural BMPs will accumulate significant quantities of sediment over time. Sediment gradually reduces the available stormwater storage capacity. A rule of thumb for BMPs such as detention ponds, extended detention ponds and stormwater ponds is that approximately 1% of the storage volume capacity associated with the 2-year design storm can be lost annually due to accumulated sediment. Therefore, approximately 20% of a pond's total storage capacity can be lost within 20 years.

The actual sediment accumulation rate is dependent upon a number of factors including watershed size, facility sizing, upstream construction, nearby industrial activities and land uses, numbers of leaking vehicles, use of sand and salt during winter, etc. Thick grass and vegetation will retain sediment and silt at a faster rate.

In addition to long-term maintenance, sediment disposal is usually necessary during the construction process. Erosion prevention and sediment control practices and devices are not 100% effective at reducing and eliminating all sediment. Therefore, the developer must ensure that the designed detention volume has been restored and that all graded surfaces have been completely stabilized at the end of construction.

Structural BMPs shall be inspected on a regular basis to determine the impact of existing sedimentation on the capacity. The frequency of inspection is dependant upon the upstream land use(s), type of BMP, and other factors. Inspections should occur during dry weather and wet weather conditions. In general, remove sediment prior to significant accumulations using a combination of equipment methods and hand shoveling. Typical intervals for sediment removal will be every 5 to 7 years for some BMP types, 10 to 20 years for others. Typical intervals for sediment removal for sediment forebay or other pretreatment settling basin will be once a year. Detailed guidance on the frequency of inspection and maintenance activities relating to sediment accumulation specific to each structural BMP that is presented in this manual is provided in Chapter 4.



Guidance for Assessment and Disposal:

1. If the structural BMP meets any of the following criteria, then the structural BMP owner must contact the Tennessee Department of Environment and Conservation (TDEC) for further regulations and recommended disposal guidelines.
 - a. known contaminants are contained in the stormwater runoff that discharges to the structural BMP or in the sediment that has accumulated in the structural BMP.
 - b. the structural BMP receives stormwater runoff from an industrial site.
 - c. the structural BMP receives stormwater runoff from a fueling center.
 - d. The structural BMP receives stormwater runoff from one or more commercial businesses with a total parking area of at least 120,000 square feet or 400 parking spaces.
 - e. the local jurisdiction has reason to believe that contaminants are present based upon scientific or engineering information.

In all cases, treat sediment from structural BMPs as potentially hazardous soil until proven otherwise. Sediments should be sampled and identified before removal and disposal operations proceed. Contact the local office of TDEC – Division of Water Pollution Control to discuss special disposal procedures.

2. If the structural BMP does not meet any of the above criteria, or if the sediment has been tested and is determined to be free of contamination, then the following disposal practices are allowed:
 - a. disposal at a Class III or Class IV landfill.
 - b. use for fill material, cover material or land spreading on the project site.
 - c. other disposal options as approved by the local jurisdiction.

All sediment which is disposed onsite must be prevented from re-entering the structural BMP, or entering any other BMP, drainage channel or culvert, natural creeks or streams, or any other component of the stormwater drainage system.