

CHAPTER 8

WATER QUALITY BEST MANAGEMENT PRACTICES

8.1 Non-Structural BMPs

8.1.1 Introduction

Best management practices (BMPs) are the basic mitigation measures used in storm water quality management plans to control pollutants. Section 8.3 of this chapter presents the details of structural BMPs that could be applied within the municipal drainage system. The other major category of BMPs includes the many non-structural or source control practices that can be used for pollution prevention and control of pollutants. In most cases it is much easier and less costly to prevent the pollutants from entering the drainage system than to try to control pollutants with structural BMPs. Thus within the “treatment train” concept, the non-structural BMPs should be the first line of defense in protecting the receiving streams. If used properly, non-structural BMPs can be very effective in controlling pollutants and greatly reduce the need for structural BMPs. In addition, non-structural BMPs tend to be less costly, easier to design and implement, and easier to maintain than structural BMPs. Non-structural BMPs normally do not have technical or engineering designs associated with them but are measures that the City or other agencies or groups might require or implement to assist in the management of water quality and the control of pollutants within the city. Following is a brief discussion of some non-structural BMPs that can be used within a storm water quality management plan for different portions of the City of Lawrenceville drainage system.

8.1.2 Public Education/Participation

Public education/participation is not so much a best management practice as it is a method by which to implement BMPs. Public education/participation are vital components of many of the individual source control BMPs. A public education and participation plan provides the City with a strategy for educating its employees, the public, and businesses about the importance of protecting storm water from improper use, storage, and disposal of pollutants. City employees must be trained, especially those that work in department not directly related to storm water but whose actions affect storm water. Residents must become aware that a variety of hazardous products are used in the home and that their improper use and disposal can pollute storm water and groundwater supplies. Businesses, particularly smaller ones that may not be regulated by federal, state, or local regulations, must be informed of ways to reduce their potential to pollute storm water.

8.1.3 Land Use Planning/Management

This BMP presents an important opportunity to reduce the pollutants in storm water runoff by using a comprehensive planning process to control or prevent certain land use activities in areas where water quality is sensitive to development. It is applicable to all types of land use and represents one of the most effective pollution prevention practices. Subdivision regulations, zoning ordinances, preliminary plan reviews, and detailed plan reviews are tools that may be used to mitigate storm water contamination in newly developing areas. Also, master planning, cluster development, terracing and buffers are ways to use land use planning as a BMP in the normal design for subdivisions and other urban developments. An impervious cover limitation is one of the more effective land use management tools, since nationwide research has consistently documented increases in pollution loads with increases in impervious cover. In addition to controlling impervious area cover, directly connected impervious areas are kept to a minimum. This is especially important for large impervious areas such as parking lots and highways, and it can also be effective for small impervious areas such as roof drainage.

8.1.4 Material Use Controls

There are three major BMPs included in this category:

1. Housekeeping Practices
2. Safer Alternative Products
3. Pesticide/Fertilizer Use

In housekeeping practices, the goal is to promote efficient and safe practices such as storage, use, cleanup, and disposal, when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products and swimming pool chemicals. In addition, the use of less harmful products can be promoted. Alternatives exist for most product classes including fertilizers, pesticides, cleaning solutions, and automotive and paint products.

Pesticides and fertilizers have become an important component of land use and maintenance for municipalities, commercial land uses and residential landowners. Any usage of pesticides and fertilizers increases the potential for storm water pollution. BMPs for pesticides and fertilizers include education on their use, controlling runoff from affected areas, controlling times when they are used, providing proper disposal areas, etc.

8.1.5 Material Exposure Controls

There are two major BMPs included in this category:

1. Material Storage Control
2. Vehicle Use Reduction

Material storage control prevents or reduces the discharge of pollutants to storm water material delivery and storage through such measures as minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and/or training employees and subcontractors.

Vehicle use reduction helps reduce the discharge of pollutants to storm water from vehicle use by highlighting the storm water impacts, promoting the benefits of alternative transportation to storm water quality, and integrating initiatives with existing or emerging regulations and programs.

8.1.6 Material Disposal and Recycling

There are three major BMPs included in this category:

1. Storm Drain System Signs
2. Household Hazardous Waste Collection
3. Used Oil Collection

Stenciling the storm drain system (inlets, catch basins, channels, and creeks) with prohibitive language/graphic icons discourages the illegal dumping of unwanted materials. Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets.

Household hazardous wastes are defined as waste materials which are typically found in homes or similar sources, which exhibit characteristics such as: corrosivity, ignitability, reactivity, and/or toxicity, or are listed as hazardous materials by the EPA. Household hazardous waste collection programs are a preventative rather than curative measure and may reduce the need for more elaborate treatment controls. Programs can be a combination of permanent collection centers, mobile collection centers, curbside collection, recycling, reuse, and source reduction.

Used oil recycling is a responsible alternative to improper disposal practices such as dumping oil in the sanitary sewer or storm drain system, applying oil to roads for dust control, placing used oil and filters in the trash for disposal to landfill, or simply pouring used oil on the ground. Commonly used oil collection alternatives are a temporary “drop off” site on designated collection days or the use of private collectors such as automobile service stations, quick oil change centers and auto parts stores.

8.1.7 Spill Prevention and Clean-up

There are two major BMPs included in this category:

1. Vehicle Spill Control
2. Aboveground Tank Spill Control

The purpose of a vehicle spill control program is to prevent or reduce the discharge of pollutants to storm water from vehicle leaks and spills by reducing the chance for spills by preventive maintenance, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees. It is also very important to respond to spills quickly and effectively.

Aboveground tank spill control programs prevent or reduce the discharge of pollutants to storm water by installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill clean-up techniques.

8.1.8 Dumping Controls

This BMP addresses the implementation of measures to detect, correct, and enforce against illegal dumping of pollutants on streets and into the storm drain system, streams, and creeks. Substances illegally dumped on streets and into the storm drain system and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes.

8.1.9 Connection Controls

There are three major BMPs included in this category:

1. Illicit Connection Prevention
2. Illicit Connection Detection and Removal
3. Leaking Sanitary Sewer Control

Illicit connection protection tries to prevent unwarranted physical connections to the storm drain system from sanitary sewers, floor drains, etc., through regulation, regular inspection, testing, and education. In addition, programs include implementation control procedures for detection and removal of illegal connections from the storm drain conveyance system. Procedures include field screening, follow-up testing, and complaint investigation.

Leaking sanitary sewer control includes implementing control procedures for identifying, repairing, and remediating infiltration, inflow, and wet weather overflows from sanitary sewers into the storm drain conveyance system. Procedures include field screening, testing, and complaint investigation.

8.1.10 Street/Storm Drain Maintenance

There are seven major BMPs included in this category:

1. Roadway Cleaning

2. Catch Basin Cleaning
3. Vegetation Controls
4. Storm Drain flushing
5. Roadway/Bridge Maintenance
6. Detention/Infiltration Device Maintenance
7. Drainage Channel/Creek Maintenance

Roadway cleaning on a regular basis may help reduce the discharge of pollutants to storm water from street surfaces. However, cleaning often removes the larger sizes of pollutants but not the smaller sizes. Most pollutants are deposited within three feet of the curb, which is where the roadway cleaning should be concentrated. Catch basin cleaning on a regular basis also helps reduce pollutants in the storm drain system, reduces high pollutant concentrations during the first flush of storms, prevents clogging of the downstream conveyance system and restores the catch basins' sediment tapping capacity.

Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. Mechanical vegetation control includes such measures as leaving existing vegetation, cutting less frequently, handcutting, planting low maintenance vegetation, mulching, collecting and properly disposing of clippings and cuttings, and education employees.

Storm drains can be "flushed" with water to suspend and remove deposited materials. Flushing is particularly beneficial for storm drain pipes with grades too flat to be self-cleansing, in that it helps ensure that pipes convey their design flow and removes pollutants from the storm drain system. However, flushing will only push the pollutants into downstream receiving waters unless the discharge from the flushing is captured and removed from the drainage system. Jet-Vac trucks should be employed to remove debris from this process.

Roadway/bridge maintenance is used to prevent or reduce the discharge of pollutants to storm water by paving as little area as possible, designing bridges to collect and convey storm water to proper locations, using measures to prevent runoff from entering the drainage system, properly disposing of maintenance wastes, and training employees.

Proper maintenance and silt removal is required on both a routine and corrective basis to promote effective storm water pollutant removal efficiency for wet and dry detention ponds and infiltration devices. Also, regularly removing illegally dumped items and material from storm drainage channels and creeks will reduce pollutant levels.

8.1.11 Permanent Erosion Control

There are three major BMPs included in this category:

1. Erosion Control – Permanent Vegetation

2. Erosion Control – Flow Control
3. Erosion Control – Channel Stabilization

Vegetation is a highly effective method for providing long term, cost effective erosion protection for a wide variety of conditions. It is primarily used to protect the soil surface from the impact of rain and the energy of the wind. Vegetation is also effective in reducing the velocity and sediment load in runoff sheet flow.

Channel stabilization addresses the problem of erosion due to concentrated flows. Concentrated flows occur in channels, swales, creeks, rivers and other water courses in which a substantial drainage area drains into a central point. Overland sheet flow begins to collect and concentrate in the form of rills and gullies after overland flow of as little as 100 feet. Erosion due to concentrated flow is typically extensive, causing large soil loss, undermining foundations and decreasing the flow capacity of watercourses.

Proper selection of ground cover is dependent on the type of soil, the time of year of planting, and the anticipated conditions to which the ground cover will be subjected. In addition, mulching is a form of erosion protection that is commonly used in conjunction with establishment of vegetation. It typically improves infiltration of water; reduces runoff; holds seed, fertilizer and lime in place; retains soil moisture; helps maintain temperatures; aids in germination; retards erosion; and helps establish plants in disturbed areas.

Once flow is allowed to concentrate, it is more difficult to control erosion problems. Thus every effort should be made to maintain sheet flow conditions for runoff. Where concentrated flows are unavoidable, the following measures can be used to control erosion and resulting water quality problems:

- Rip Rap
- Level Spreaders
- Gabions
- Armor Protection
- Check Dams
- Diversions

For more information on erosion control consult the publication *Manual for Erosion and Sediment Control in Georgia*, available from the Georgia Soil and Water Conservation Commission.

END OF SECTION 8.1