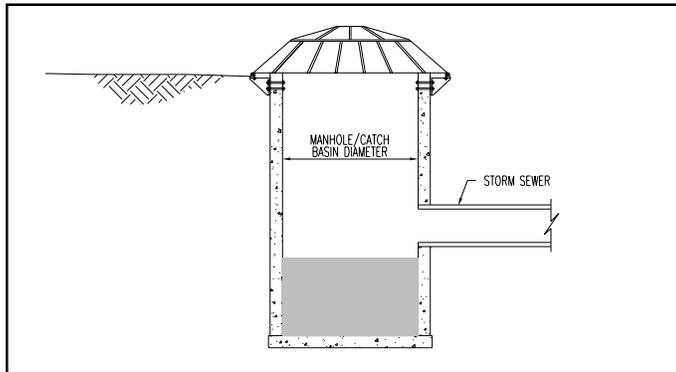


Housekeeping

BMP Maintenance



Description

All BMPs require periodic maintenance to maintain and enhance their performance. This section summarizes some of the general maintenance of BMPs in this publication (see individual BMPs for details) as well as routine maintenance that should be applied to existing devices such as catch basins and ditches.

Maintenance schedules vary greatly depending on BMP location, surrounding land use and soil stability in the watershed. Some BMPs require sediment removal every two or three years, while others may not need attention for decades.

Sediment removal applies to pond and wetland systems as well as filtration systems such as grit chambers and surface sand filters. If not removed, sediment reduces storage capacity, short-circuiting removal function and resuspending previously settled particles.

Removing floatables helps prevent outlet structures from becoming blocked and changing hydraulics. It is also valuable from an aesthetic standpoint.

Vegetative maintenance applies to constructed wetlands, filter strips, wet and dry swales and bioretention facilities. Practices (which will differ depending on BMP and condition) include mowing, reseeding, resodding and removing dead plant material.

See Table 1a and 1b for a summary of maintenance on some of the most common BMPs.

Catch Basins

Catch basins, which function as “entrance chambers” to a storm sewer, often have a low area called a sump, which is intended to retain sediment. By trapping coarse sediment, the catch basin prevents solids from clogging the storm sewer or being washed into receiving waters.

Purpose

	Water Quantity
Flow attenuation	*
Runoff volume reduction	*
	Water Quality
Pollution prevention	
Soil erosion	*
Sediment control	*
Nutrient loading	*
Pollutant removal	
Total suspended sediment (TSS)	*
Total phosphorus (P)	*
Nitrogen (N)	*
Heavy metals	*
Floatables	*
Oil and grease	*
Other	
Fecal coliform	*
Biochemical oxygen demand (BOD)	*

* *Depends on timing and frequency of maintenance practices.*

	Primary design benefit
	Secondary design benefit
	Little or no design benefit

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However, these low areas must be cleaned out periodically to maintain their sediment-trapping ability. In addition to reducing coarse sediment loads, catch basin cleaning also reduces the load of oxygen-demanding substances (such as leaf debris) that reaches surface water.

It has been reported that once a sump is 40 to 60 percent full, any inflow could have a flushing effect and actually generate sediment loading in water passing through the catch basin (Pitt, 1985). The first flush of stagnant water and debris in the sewer system by the stormwater runoff may contain a high concentration of pollutants, such as metals and hydrocarbons. The sediment and debris flushed out may clog downstream stormwater conveyance systems.

The rate at which catch basins fill and the total amount of material collected during different cleaning frequencies is highly variable. In general, if the contributing watershed has active construction or other land uses that create high sediment loads, the catch basin should be cleaned more often than in stabilized areas.

Over a year's time, monthly cleaning removes about six times more sediment than cleaning annually. This can be accomplished either manually or with a vacuum truck.

Of course, there is additional cost associated with more frequent cleanouts. Preventive measures, such as street sweeping and reducing winter road sanding, may reduce deposition significantly, making annual cleanouts adequate. (See Pavement Management.)

Ditches

Roadside ditches can contribute significant sediment to runoff, both from channelization and erosion within the ditch and accumulated sediment and other fine debris from the road surface (especially if pavement is in poor repair). Timely maintenance of deteriorating roads and cleaning and stabilization of ditches can help to reduce pollutant loadings.

Ditches should be inspected at least annually. Periodic repairs may include reseeding or replanting and removing sediment. If problems recur, the ditches may need to be altered. Solutions may include reducing the length and slope of ditch runs and reducing the velocity of runoff by using check dams. (See Check Dams and Dry Swales.)

Sediment Disposal

Stormwater sediments removed from publicly owned systems generally do not meet the criteria of "hazardous waste." However, these sediments are contaminated with a wide array of organic and inorganic pollutants well beyond the levels of these pollutants in the raw storm water itself. Regardless of the source of these residual wastes from stormwater treatment, handling and disposal must be done with care.

- Sediments from constructed wetlands or ponds must be carefully removed to minimize turbidity, further sedimentation, or other adverse water-quality impacts.
- Sediments should be transported by motor vehicle only after they are dewatered.
- Hydraulically transported sediments should go only to a secure disposal facility designed to hold the entire volume of sediment and the transport water.
- Should a spill occur during transportation, prompt and thorough cleanup is important.

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BMP	Activity	Schedule
Retention Pond / Wetland¹	<ul style="list-style-type: none"> • Cleaning and removal of debris after major storm events • Harvest excess vegetation • Repair of embankment and side slopes • Repair of control structure 	Annual or as needed
	<ul style="list-style-type: none"> • Removal of accumulated sediment from forebays or sediment storage areas 	5-year cycle, or as needed
	<ul style="list-style-type: none"> • Removal of accumulated sediment from main cells of pond once the original volume has been significantly reduced 	5- to 10-year cycle
Detention Basin	<ul style="list-style-type: none"> • Removal of accumulated sediment • Repair of control structure • Repair of embankment and side slopes 	Annual or as needed
Infiltration Trench¹	<ul style="list-style-type: none"> • Cleaning and removal of debris after major storm events • Mowing⁴ and maintenance of upland vegetated areas • Maintenance of inlets and outlets 	Annual or as needed
Infiltration Basin²	<ul style="list-style-type: none"> • Cleaning and removal of debris after major storm events • Mowing⁴ and maintenance of upland vegetated areas 	Annual or as needed
	<ul style="list-style-type: none"> • Removal of accumulated sediment from forebays or sediment storage areas 	3- to 5-year cycle
Sand Filters³	<ul style="list-style-type: none"> • Removal of trash and debris from control openings • Repair of leaks from the sedimentation chamber or deterioration of structural components • Removal of the top few inches of sand and cultivation of the surface when filter bed is clogged (only works for a few cycles) • Clean-out of accumulated sediment from filter bed chamber • Clean out of accumulated sediment from sedimentation chamber 	Annual or as needed

-table continued on next page-

1. Modified from Livingston et al (1997)
2. Modified from Livingston et al (1997), based on infiltration trench requirements
3. Modified from Claytor and Schueler (1996)
4. Mowing may be required several times a year, depending on local conditions

Figure 1a: Recommended BMP Maintenance Schedules

Source: U.S. EPA, 1999

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BMP	Activity	Schedule
Bioretention¹	<ul style="list-style-type: none"> • Repair of eroded areas • Mulching of void areas • Removal and replacement of all dead and diseased vegetation • Watering of plant material 	Bi-Annual or as needed
	<ul style="list-style-type: none"> • Removal of mulch and application of a new layer 	Annual
Grass Swale²	<ul style="list-style-type: none"> • Mowing⁴ and litter and debris removal • Stabilization of eroded side slopes and bottom • Nutrient and pesticide use management • De-thatching swale bottom and removal of thatching • Disking or aeration of swale bottom 	Annual or as needed
	<ul style="list-style-type: none"> • Scraping swale bottom, and removal of sediment to restore original cross section and infiltration rate • Seeding or sodding to restore ground cover (use proper erosion and sediment control) 	5-year cycle
Filter Strip³	<ul style="list-style-type: none"> • Mowing⁴ and litter and debris removal • Nutrient and pesticide use management • Aeration of soil in the filter strip • Repair of eroded or sparse grass areas 	Annual or as needed

1. Modified from Prince George's County (1993)

2. Modified from Livingston et al (1997)

3. Modified from Livingston et al (1997), based on grass swale recommendations

4. Mowing may be required several times a year, depending on local conditions

Figure 1b: Recommended BMP Maintenance Schedules

Source: U.S. EPA, 1999

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Sources

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