

Chapter 7 - Solids and Floatable Control

Solids and floatable control focuses on using preventative measures to help reduce the amounts of solids and floatable materials which may enter or result from the MS4s. “Solid and floatable materials” means sediment, debris, trash, and other floating, suspended, or settleable solids. The permit targets the reduction of solids and floatables since they are one of the most visible pollutants that impact our receiving waters. Many solids on streets come from pavement, tire and vehicle equipment wear, and often contain heavy metals and petroleum hydrocarbons. Solids are also produced by erosion along roads and in the vicinity of stormwater outfall pipes. These solids contribute to siltation of waterways and make streambeds unsuitable for many species reproduction. Solids and floatables also create nuisances such as odors and toxic/corrosive gases. Solids and floatables are also aesthetically unappealing, making water look dirty, turbid and cloudy.

Street Sweeping

WHAT IS REQUIRED?

Minimum Standard

Public Complexes shall sweep all parking lots and curbed streets (including roads or highways) owned or operated by the Public Complex with storm drains that have a posted speed limit of 35 mph or less (excluding all entrance and exit ramps) at a minimum of once per month, weather and street surface conditions permitting.

Measurable Goal

Public Complexes shall certify annually that they have met the Street Sweeping minimum standard. Public Complexes must maintain records including the date and areas swept, number of miles of streets and parking lots swept and the total amount of materials collected. Information shall be reported to the Department in the annual report and certification.

Implementation Schedule

Within 12 months of effective date of permit authorization Public Complexes shall have developed and begun implementing a street sweeping program that meets the minimum standard above.

WHAT DOES THIS MEAN?

What streets need to be swept?

The only streets (including roads and highways) that need to be swept are streets that meet **all** of the following criteria:

- the parking lot or street is owned or operated by the Public Complex;
- the street is curbed and has storm drains;
- the street has a posted speed limit of 35 mph or less; and
- the street is not an entrance or exit ramp.

Public Complexes are required to sweep these streets and parking lots monthly (weather and street surface conditions permitting) and maintain appropriate record keeping, which will allow the completion of the Annual Report and Certification. The Department defined which streets need to be swept in an attempt to target those streets where sweeping may be most feasible or effective. The Department encourages all Public Complexes to maintain existing street sweeping and try to sweep all streets within the Public Complex once per year.

WANT TO KNOW MORE?

Street sweeping removes silt, trash, total suspended solids (TSS), hydrocarbons, excessive nutrients such as phosphorous and nitrogen, and other chemicals from the roadside before they are discharged from the storm drain system. Studies have revealed that the vast majority of toxic and conventional pollutants found in stormwater are associated with automobile maintenance and use. Studies have identified gasoline combustion, brake fluid, transmission oil, antifreeze, grease, undercoating and tire and brake lining wear as the chief contributors. Since little can be done to prevent the pollutants from depositing on street surfaces, attention must be focused on removing the accumulated materials. A regular street-sweeping program will help to clean and maintain the attractiveness of communities and enhance business viability and residential values.

It is also important to note there is a relationship between regular sweeping and maintenance of catch basins and other stormwater facilities. A regular sweeping program will reduce the amount of material accumulating in such facilities, reducing the need for frequent cleaning. More information on catch basin and stormwater facility maintenance can be found in this Chapter of the guidance document

For information on how to properly dispose of materials collected during street sweeping and catch basin cleaning see <http://www.state.nj.us/dep/dshw/rrtp/sweeping.htm>.

For information on the beneficial use program see <http://www.state.nj.us/dep/dshw/rrtp/bud.htm>.

Recommendations

The following are recommendations that may be beneficial, but are not required by the permit.

- Higher efficiency street sweepers should be considered when purchasing new equipment (e.g., regenerative air and vacuum filter street sweepers).
- By sharing staff and equipment, Public Complexes may benefit by saving money and resources.

Storm Drain Inlets (Retrofitting)

WHAT IS REQUIRED?

Minimum Standard

Retrofitting of existing storm drain inlets to meet the standard contained in Attachment C of the permit is required where such inlets are in direct contact with repaving, repairing (excluding repair of individual potholes), reconstruction or alterations of facilities operated by the Public Complex. For exemptions to this standard, refer to “Exemptions” in Attachment C.

Measurable Goal

Public Complexes shall certify annually that such storm drain inlets have been retrofitted to meet the minimum standard contained in Attachment C, unless otherwise exempted.

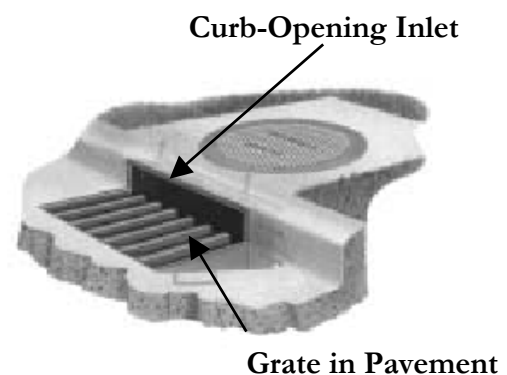
Implementation Schedule

Within 12 months of the effective date of permit authorization and thereafter, Public Complexes shall retrofit all such storm drain inlets in accordance with the Storm Drain Inlets minimum standard.

WHAT DOES THIS MEAN?

Any time your Public Complex does any repaving, repairing, reconstruction or alterations of facilities operated by the Public Complex, storm drain inlets in direct contact with the repaving, repairing, reconstruction or alterations must be retrofitted or replaced to meet the standard contained in Attachment C of the permit. Facilities include all roads, all parking lots, and any other area that the Public Complex owns or operates that have storm drain inlets. Repairing does not include the filling of individual potholes.

There are separate design standards for grates in pavement or other ground surfaces, and for curb-opening inlets. Each standard is described below. These standards help prevent certain solids and floatables (e.g., cans, plastic bottles, wrappers, and other litter) from reaching the surface waters of the State.



It is important to note that Attachment C of the permit also contains a number of exemptions to the storm drain inlet retrofitting requirement. The exemptions include:

- grandfathering of projects that began construction or were awarded bid prior to March 3, 2004;
- hydraulic performance exemption when the Public Complex determines that the standard would cause inadequate hydraulic performance (flooding);
- historic places exemption for situations where action to meet this standard constitutes an encroachment or will damage or destroy a New Jersey Register listed historic property;
- alternative device exemption where flows are already conveyed through a device that meets certain standards to prevent the delivery of solids and floatable materials;
- an exemption for **existing** curb-opening inlets if each individual clear space in the curb opening is no larger than 9 square inches.

Attachment C of the permit and guidance provided below should be consulted for the actual standard for grates and curb-opening inlets and specific exemption language.

Grates In Pavement or Other Ground Surfaces

This standard applies to grates that are used in pavement or another ground surface to collect stormwater into a storm drain or surface water body under the grate.

Examples of storm drain inlet grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.

Many grate designs meet the standard. The first option (especially for storm drain inlets along roads) is to use the New Jersey Department of Transportation (NJDOT) bicycle safe grate. This grate is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines, which is available at:

http://www.state.nj.us/transportation/publicat/bike_guidelines.htm.

The other option is to use a different grate, as long as each “clear space” in the grate (each individual opening) is:

- No bigger than seven (7.0) square inches

OR

- No bigger than 0.5 inches (1/2 inch) across the smallest dimension (length or width).

Curb-Opening Inlets (including Curb-Opening Inlets in Combination Inlets)

If the storm drain inlet has a curb opening, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) must be:

- No bigger than two (2.0) inches across the smallest dimension (length or width) - many curb-opening inlets installed in recent years meet this criterion

OR

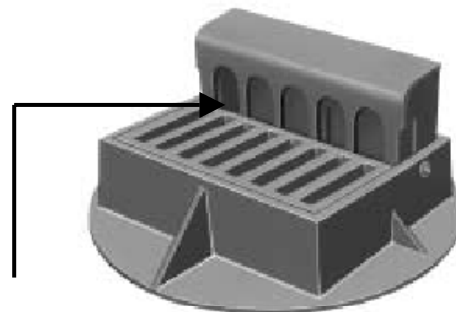
- No bigger than seven (7.0) square inches

Option 1 (Example)



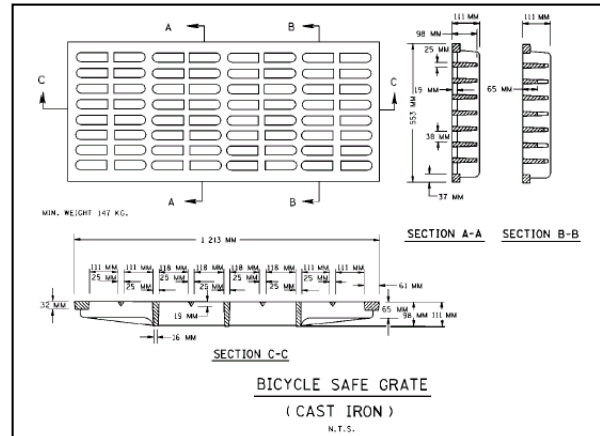
A curb-opening with a “clear space” no bigger than 2” across the smallest dimension

Option 2 (Example)



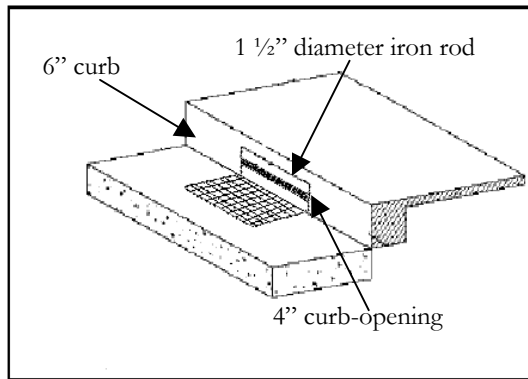
Each individual hole (“clear space”) in the curb-opening is no bigger than 7 square inches

NJDOT “Bicycle Safe” Grate



Source: Standard Roadway Construction Details, NJDOT

Retrofitting Discussion



After retrofit w/ 1 1/2" diameter rod, each clear space of the curb-opening is 1 1/4" across the smallest dimension.

Public Complexes which are undertaking a repaving, repairing, reconstruction or alteration project that will require the retrofitting of storm drain inlets pursuant to this section of the permit, have 2 choices: a) replace the hood piece, or b) retrofit the curb-opening inlet to meet the new design standard. (In most situations the grate will need to be replaced since there is no practical way to retrofit a grate to meet the standard.) Replacing the gutter inlet or hood piece may be the easiest solution. The Department has worked with a number of foundries to ensure a style is manufactured that meets the new design standard. A lower cost option would be to retrofit the curb-opening inlet by dividing the existing opening into 2 or more smaller openings (each no bigger than two (2.0) inches across the

smallest dimension) with a bar, rod, or flat iron. This bar or flat iron needs to be permanently affixed to the casting by attaching to the existing bolt pattern on the hood piece or by some other method. This retrofitting technique has successfully been done, and can be seen in many NJ locations. Replacing the grate with a grate that extends to the back of the curb opening is another option.

Exemptions

For purposes of this SBR, the requirements of this standard do not apply whenever any of the following exemptions listed in Attachment C are applicable:

- A **“Hydraulic Performance Exemption”** where the Public Complex or other review agency determines that this standard would cause inadequate hydraulic performance.
- Either of two **“Alternative Device Exemptions”**:
 - The first of these exemptions is where flows from the “water quality design storm” as specified in N.J.A.C. 7:8 are conveyed through any device or combination of devices (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent the passage of all solid and floatable materials that could not fit through one of the following:
 1. A rectangular space that is four and five-eighths ($4\frac{5}{8}$) inches long and one and one-half ($1\frac{1}{2}$) inches wide (this option does not apply for outfall netting facilities); or
 2. A bar screen that has a $\frac{1}{2}$ inch (0.5 inches) opening between each bar.
 - The second of these exemptions is where flows are conveyed through a trash rack that has parallel bars with one-inch (1.0 inch) spacing between the bars, to the elevation of the “water quality design storm” as specified in N.J.A.C. 7:8.

One of the requirements in the new Stormwater Management Rules at N.J.A.C. 7:8-5.7(a)2 is that “trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm” [emphasis added].

In the new Stormwater Management Rules, the “water quality design storm” is specified at N.J.A.C. 7:8-5.5(a).

- A **“Historic Places Exemption”** where the Department determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

WANT TO KNOW MORE?

Several studies have been conducted to determine what materials are most often discharged to storm sewers. Some of the most commonly found materials were polystyrene pieces, pieces of paper, candy and food wrappers, plastic bag fragments, and metal foil, with the biggest offender being plastic products. The useful qualities of plastic (it is cheap and plentiful) make it a tremendous pollution problem. Plastic needs ultraviolet light to decompose, taking hundreds of years to decay. In the meantime plastic continues to accumulate in our waterways, causing the deaths of many mammals, fish, birds and reptiles each year.

Every piece of solid or floatable material that is caught before it enters or leaves a storm drainage system will benefit the environment. Minimizing the size of spaces in storm drain inlet grates and curb openings will trap certain solid and floatable materials before they reach our waterways. However, these spaces must also be large enough to provide adequate hydraulic performance.

Recommendations

The following recommendations may be beneficial but are not required by the permit.

- Retrofit existing storm drain inlets to meet the standard contained in Attachment C earlier than required by the permit (rather than waiting until repaving or other projects).
- Increase street sweeping (above the minimum standard) to reduce clogging of storm drain inlets.
- Use additional devices to remove solid and floatable materials including trash racks, mesh nets, bar screens and trash booms.

Stormwater Facility Maintenance

WHAT IS REQUIRED?

Minimum Standard

Public Complexes shall develop and implement a stormwater facility maintenance program for cleaning and maintenance of all stormwater facilities operated by the Public Complex. Stormwater facilities include, but are not limited to: catch basins, detention basins, filter strips, riparian buffers, infiltration trenches, sand filters, constructed wetlands, wet ponds, bioretention systems, low flow bypasses, and stormwater conveyances. The stormwater facility maintenance must be performed as required to ensure the proper function and operation of the stormwater facility.



As sweeping increases and storm drain inlets are retrofitted, amounts of material removed during catch basin cleaning should decrease.

Public Complexes shall also clean all catch basins operated by the Public Complex annually to remove accumulated sediment, trash and debris.

Measurable Goal

Public Complexes shall certify annually that all stormwater facilities are properly functioning and that all catch basins have been cleaned in accordance with the minimum standard. If stormwater facilities were found not to be functioning properly and repairs were not made, a schedule for such repairs shall be included in the annual report and certification. Public Complexes shall also maintain records of inspections, maintenance and repairs that were performed which shall be reported in the annual report and certification.

Implementation Schedule

Within 12 months from the effective date of permit authorization, Public Complexes shall have developed and begun implementing a stormwater facility maintenance program in accordance with the minimum standard.

WHAT DOES THIS MEAN?

This BMP requires that the Public Complex maintain all of its stormwater facilities to ensure that they are properly functioning. The BMP also requires the annual inspection and cleaning of all catch basins owned or operated by the Public Complex. If, during the inspection of the catch basin, no sediment, trash or debris is observed, then the catch basin does not have to be cleaned that year. A catch basin is a cistern, vault, chamber or well that is usually associated with a storm drain inlet along a street, with the capability to trap debris and some sediments before they travel further into the MS4. Typically, a catch basin has a sump at its base.

This stormwater facility maintenance BMP does not include **private or public stormwater facilities** that discharge into the Public Complex's MS4 but are not operated by the Public Complex. Proper maintenance, including preventative maintenance, of stormwater facilities ensures they operate as designed. Stormwater facilities vary due to the environmental effect desired, from simple conveyance to designed wetland ecosystems that mimic nature. Many stormwater facilities like wet ponds, filter strips, and manmade wetlands provide pollutant removal. Additional stormwater facilities like infiltration basins, infiltration trenches and porous paving are designed to recharge groundwater. All must be maintained to operate at the designed efficiency.

Information on proper maintenance of many stormwater facilities is found in the New Jersey Stormwater Best Management Practices Manual as amended.

- For information on the proper handling and disposal of the debris collected during catch basin cleaning, see <http://www.state.nj.us/dep/dshw/rntp/sweeping.htm>.

(**Note:** In accordance with this guidance, at a minimum, all potentially contaminated road cleanup material must be staged on an impervious surface and covered with a waterproof material (i.e., tarpaulin or 10-mil plastic sheeting). The containment must be maintained for the duration of the staging period to prevent contaminant volatilization, runoff, leaching, or fugitive dust emissions. See above guidance for specifics.)

- For information on the beneficial reuse program see: <http://www.state.nj.us/dep/dshw/rntp/bud.htm>.

WANT TO KNOW MORE?

Recommendations

Listed below are recommendations, not required by the permit, to help maintain stormwater facilities.

- Increase catch basin inspection and cleaning in problem areas (e.g., prone to flooding).
- Perform maintenance inspections after major storm events.
- Increase street sweeping (above the minimum standard) to decrease the amount of materials entering the catch basins and other stormwater facilities.
- Coordinate the timing of catch basin cleaning with the local mosquito control agency where possible.

Road Erosion Control Maintenance

WHAT IS REQUIRED?

Minimum Standard

Public Complexes shall develop a roadside erosion control maintenance program to identify and repair erosion along streets (including roads or highways) operated by the Public Complex. Public Complexes are also required to regularly inspect and maintain the stability of shoulders, embankments, ditches and soils along these streets to ensure that they are not eroding and contributing to sedimentation of receiving waters. Repairs shall be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, N.J.A.C. 2:90-1 (or N.J.A.C. 16:25A where NJDOT operates the Public Complex).

Measurable Goal

Public Complexes shall certify annually that they have developed and are implementing a roadside erosion control maintenance program. The certification shall also indicate the locations of all problem areas corrected and any maintenance done during that year. The dates of all inspections and employee training sessions shall also be reported in the annual report and certification.

Implementation Schedule

Within 18 months from the effective date of permit authorization, Public Complexes shall have developed and begun implementing a roadside erosion control maintenance program in accordance with the minimum standard.

WHAT DOES THIS MEAN?

Public Complexes must develop a program to detect and repair erosion along the streets (including roads and highways) operated by the Public Complex, and to regularly inspect and maintain the stability of shoulders, embankments, ditches and soils along these streets to ensure that they are not eroding and contributing to sedimentation of receiving waters. This requirement for road erosion control is limited to streets, shoulders, embankments, ditches and soils for which the Public Complex has, alone or along with other persons, primary management and operational decision-making authority. In some instances, these areas may not include the entire right-of-way owned by the Public Complex. Any repairs are to be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey (N.J.A.C. 2:90-1), or with the NJDOT Soil Erosion and Sediment Control Standards at N.J.A.C. 16:25A where NJDOT operates the Public Complex.

It is important to note that this is an ongoing program and that all erosion along these streets operated by the Public Complex does not need to be repaired in any specific timeframe. Public Complexes however, must be able to show that there is an effective program in place and that repairs are being made. The Department does not expect that where existing erosion is widespread, all repairs will be completed during the initial five-year term of the permit. Rather the Department expects the Public Complex to show an ongoing, good faith effort to accomplish such repairs (including a prioritized schedule of the repairs).

WANT TO KNOW MORE?

New Jersey has approximately 35,600 miles of roads and more highways, per square mile, than any other state. Erosion along these streets, highways, and other roads contributes suspended solids, sediment and other materials to storm sewer systems and waterways.

Vegetative cover (including the root system) plays an important role in preventing erosion by: shielding the soil surface from the impact of falling rain drops and flowing water, reducing the velocity of runoff; maintaining the soil's capacity to absorb water; and holding soil particles in place. In addition, vegetative cover may also be effective at removing heavy metals from runoff. However, utilizing vegetation to control erosion may require frequent monitoring, especially in the early stages when new vegetation is being established. Standards for vegetative cover, as well as other stabilization practices are found in the Standards for Soil Erosion and Sediment Control in New Jersey. A copy of these standards can be obtained from your Local Soil Conservation District (see Chapter 14 of this guidance document for a complete listing). Standards for vegetative cover and other stabilization practices are also found in the NJDOT Soil Erosion and Sediment Control Standards.

Sedimentation or deposition of material eroded by runoff from roads and roadsides may have significant impacts on water quality, and when not maintained, roadside erosion can significantly contribute to the pollution of stormwater runoff. Sedimentation not only causes an increase of costs for ditch, culvert and catch basin cleaning, it is also the single largest contributor of pollution to our nation's waters. Sedimentation can lead to a decrease in water carrying and storage capacities of streams and reservoirs, as well as destroy fish and other aquatic habitats. For example, sedimentation can fill the pores between gravel and cobble stream bottoms, greatly decreasing the spawning areas for many fish species (including native trout) and the habitat for macroinvertebrates, which serve as food for many fish species.

Outfall Pipe Stream Scouring Remediation

WHAT IS REQUIRED?

Minimum Standard

Public Complexes shall develop and implement a stormwater outfall pipe scouring detection, remediation and maintenance program to detect and control localized stream and stream bank scouring in the vicinity of outfall pipes operated by the Public Complex. This program shall identify all areas where localized stream and bank scouring occurs as a result of stormwater discharges from the Public Complex's MS4. These areas shall then be prioritized and repairs shall be scheduled and completed. Repairs shall be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey at N.J.A.C. 2:90-1 (e.g., Conduit Outlet Protection 12-1), or N.J.A.C. 16:25A where NJDOT operates the Public Complex.



Scour holes are caused by excessive velocity of the discharge. Riprap may help dissipate the flow, reducing damage to the stream bank.

Measurable Goal

Public Complexes shall certify annually that they have met the Outfall Pipe Stream Scouring Remediation minimum standard. In addition, the Public Complex shall list the location of outfall scouring identified, the dates control measures are to begin, and the dates any control measures were completed.

Implementation Schedule

Within 18 months of the effective date of permit authorization, Public Complexes shall have developed and begun implementing an outfall pipe stream scouring detection, remediation and maintenance program. This program shall identify and prioritize all stormwater outfall pipes needing repairs, and then schedule and complete the repairs.

WHAT DOES THIS MEAN?

Public Complexes must develop a program to detect and control any active localized stream and stream bank scouring located on property operated by the Public Complex in the vicinity of outfall pipes operated by the Public Complex. The program does not apply to outfall pipes that discharge into the ocean or into any other waterways that are not “streams.” For purposes of this SBR, a “stream” may be perennial or intermittent, may be tidal or non-tidal, and may be called, for example, a “river,” “brook,” “creek,” “run,” “branch,” “kill,” or “ditch,” or may have no name. Any areas that are found to be scouring must be prioritized based on the extent of erosion, and repairs must be scheduled and completed. All repairs shall be made using methods found in the Standards for Soil Erosion and Sediment Control in New Jersey (N.J.A.C. 2:90-1) or the NJDOT Soil Erosion and Sediment Control Standards (N.J.A.C. 16:25A) where NJDOT operates the Public Complex.

Where existing active localized stream and stream bank scouring is widespread, the Department does not expect that this program will result in the repair of all such scouring in the initial five-year permit term. Rather, the Department expects this program to include an ongoing, good faith effort to accomplish such repair, which may not be completed during the initial permit term. The Department also notes that this program applies to locations where there is active scouring, but not to locations where scouring occurred in the past, but has now ceased.

Repairing scouring may be problematic due to access restriction and/or Department permitting requirements. The Department’s Land Use Regulation Program (www.nj.gov/dep/landuse) may require wetlands, stream encroachment or coastal permits prior to any repairs or remediation. Access and the need for permits/approvals may be considered when a permittee prioritizes and schedules repairs. The Department is attempting to streamline the process for getting wetlands and stream encroachment permits needed to repair localized stream and stream bank scouring and is aware that substantial time may be required to obtain these permits, which is one of the reasons why the Public Complex permit does not specify deadlines for completing repairs. Prioritizing outfall repairs in areas that allow easy access and don’t require permits may be appropriate.

WANT TO KNOW MORE?

Outfall pipe stream scouring is the localized scouring of the stream bank or bottom caused by the discharge from the outfall pipe. This type of erosion to the stream bed and stream banks can cause sedimentation in the waterways. While sedimentation is a natural process, the accelerated accumulation of sediments in aquatic ecosystems leads to a decline in surface water quality and biodiversity. For more information on the harmful environmental impacts caused by sedimentation, please see the “Want to know more” section of the Road Erosion Control Maintenance BMP in this Chapter of the guidance document.

Scouring occurs when the velocity of stormwater leaving an outfall pipe erodes the stream bottom or the stream bank. To prevent scouring from occurring, the exit velocity of the water from the outfall pipes must be dissipated and/or reduced. Stream bank stabilization is needed when vegetative stabilization practices are not practical and where the stream banks are subject to heavy erosion. One way to prevent scouring from occurring is to reduce the quantity of stormwater that reaches eroding outfall(s) by infiltrating the stormwater before it reaches the outfall. For more information on how to do this, see the New Jersey Stormwater Best Management Practices Manual as amended.

Another solution to stream and stream bank scouring is to implement one or more of the engineering standards approved by the State Soil Conservation Committee. A copy of these standards can be obtained from your Local Soil Conservation District (see Chapter 14 of this guidance document for a complete listing). The NJDOT Soil Erosion and Sediment and Control Standards are available at: <http://www.state.nj.us/transportation/>.

Recommendations

The following recommendation may be beneficial, but is not required by the permit.

- To help reduce costs, when mapping your outfall pipes, look for signs of outfall pipe stream scouring (see Illicit Connection Program/Outfall Pipe Mapping in Chapter 6). This will ensure that you do not have to make multiple visits to the same outfall pipes.