

A BRIEF GUIDE TO REQUIREMENTS FOR DEVELOPING AND IMPLEMENTING POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTIVITIES

Storm water runoff is part of the natural hydrologic cycle. However, human activities, particularly urbanization, can alter natural drainage patterns and add pollutants to the rainwater and snowmelt that run off the earth's surface and enter our Nation's rivers, lakes, streams, and coastal waters. In fact, recent studies have shown that storm water runoff is a major source of the pollutants that are damaging our sport and commercial fisheries, restricting swimming, and affecting the navigability of many of our Nation's waters.

The States and many municipalities have been taking the initiative to manage storm water discharges more effectively. Recognizing the importance of this problem, the Congress also directed the U.S. Environmental Protection Agency (EPA) to develop a Federal program under the Clean Water Act to regulate certain high priority storm water sources. The issuance of storm water discharge permits under the National Pollutant Discharge Elimination System (NPDES) is a major part of the Agency's efforts to restore and maintain the Nation's water quality.

Under ***NPDES General Permits for Storm Water Discharges From Construction Activities***, EPA requires the development and implementation of a pollution prevention plan—designed to reduce pollution at the source, before it can cause environmental problems that cost the public and private sectors in terms of lost resources and the expense of environmental restoration activities.

OVERVIEW OF POLLUTION PREVENTION PLAN REQUIREMENTS

To walk you through the requirements, the guide is organized according to the phases of the pollution prevention planning and implementation process. A set of work sheets and a model plan at the end of the document are provided to further clarify requirements. As shown on the chart on the following page, pollution prevention planning requirements have been organized to provide you with a step-by-step process for ensuring that pollutants are not making their way into the storm water discharges from your site. The six major phases of the process are (1) site evaluation and design development, (2) assessment, (3) control selection and plan design, (4) certification and notification, (5) construction/implementation, and (6) final stabilization/termination. In addition, all permit holders must meet a number of general requirements, and certain permit holders will have to meet special requirements.

This document provides background information on pollution prevention planning requirements for General Permit applicants. At the end of this document we have provided a checklist and sample Pollution Prevention Plan. A detailed manual on how to develop and implement your pollution prevention plan is available at a modest cost from the National Technical Information Service. The manual, titled *Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, provides much more specific information than this brief guide. Instructions for ordering the detailed manual and a listing of other references that you may find useful can be found at the end of this guide.

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**SIX PHASES FOR DEVELOPING AND IMPLEMENTING A STORM WATER
POLLUTION PREVENTION PLAN FOR CONSTRUCTION**

SITE EVALUATION AND DESIGN DEVELOPMENT PHASE

The first phase in preparing a Storm Water Pollution Prevention Plan for a construction project is to define the characteristics of the site and the type of construction that will be occurring. This phase is broken down into four requirements: (A) collect site information, (B) develop site design, (C) describe construction activity, and (D) prepare pollution prevention site map.

(A) Collect Site Information

In evaluating your site, you must collect the following existing information:

- **Site map**—The map should be a drawing, preferably to scale and preferably topographic, of the construction site. The best way to obtain a site map is to have your site surveyed by a professional surveyor. Alternatively, topographic maps may be available from your State or local government, or you may use the United States Geological Survey (USGS) topographical maps. Your site map will be used in subsequent steps of the development of your pollution prevention plan. The scale of the map should be small enough so that you can easily distinguish important features such as drainage swales and control measures that will be added later.
- **Soils information**—Soils information should be based on information from your specific site. Sources of soils information could include soil borings or other geotechnical investigations. Soil Conservation Service (SCS) soil surveys may also be used, and SCS surveys typically indicate whether a soil is erodible.
- **Runoff water quality**—Runoff water quality data may sometimes be available from your state or local government, e.g., the local municipal separate storm sewer authority. You may also be able to obtain runoff water quality information from the U.S. Geological Survey (USGS), State, or local watershed protection agencies.
- **Name of receiving water**—Identify the name and location of the body of water, e.g., stream, creek, run, wetland, river, lake, bay, ocean, that will receive the runoff from the construction site. If the receiving water is a tributary include the name of the ultimate receiving body of water if possible. If the site drains into a Municipal Separate Storm Sewer System, identify the system and indicate the receiving water to which the system discharges. This information is usually available from county, State, or USGS maps.

(B) Develop Site Plan Design

The next step is to develop a site plan design based primarily on the goals and objectives of the proposed facility. There are several pollution prevention principles that you should consider when you develop the site plan for the project:

- **Disturb** the smallest vegetated area possible.
- **Minimize** the amount of cut and fill.
- **Limit** impacts to sensitive areas such as:
 - Steep and/or unstable slopes
 - Surface waters, including wetlands
 - Areas with erodible soils
 - Existing drainage channels.

(C) Describe Construction Activity

In preparing your plan, you should (1) describe the purpose or goal of the construction project (e.g., a single family residential development, a multistory office building, or a highway interchange) and (2) list the soil disturbing activities necessary to complete the project. (Soil disturbing activities might include clearing, excavation and stockpiling, rough grading, final or finish grading, preparation for seeding or planting, excavation of trenches, demolition, etc.).

(D) Prepare Pollution Prevention Site Map

The final step of the site evaluation and design development phase is to combine the information collected so far into a comprehensive pollution prevention site map. The following additional information must be included on the map collected in Step A:

- **Slopes after grading**—Indicate the location and steepness of slopes after grading.
- **Disturbed areas**—Indicate the areas of soil disturbing activities or the total area of the site where soil will be disturbed. Also draw an outline of areas that will not be disturbed.
- **Drainage patterns/discharge points**—Indicate the drainage patterns of the site after the major grading activities and the location of the points where storm water will discharge from the site.
 - **Note** the downhill direction the runoff will follow as it flows across the site for the drainage pattern of the site.
 - **Use** arrows to indicate which direction runoff will flow in. Show the areas where there will be overland flow and the location of swales or channels. If there is a new or proposed underground storm drain system on the site, this should be indicated on the Storm Water Pollution Prevention Plan site map as well.

ASSESSMENT PHASE

Once the characteristics of the site and the construction have been defined, the next phase in developing a Storm Water Pollution Prevention Plan is to measure the size of the land disturbance and estimate the impact the project will have on storm water runoff from the site based on information collected in Phase 1. Three things should be done to assess the project: (A) measure the site area, (B) measure the drainage areas, and (C) calculate the runoff coefficient.

(A) Measure the Site Area

The general permit requires that you indicate in the Storm Water Pollution Prevention Plan estimates of the total site area and the area that will be disturbed. If the information is not available from one of these sources, you may measure by using the grid method or by using a planimeter. Planimeters are available from Engineering and Surveyor Supply Stores.

(B) Determine the Drainage Areas

Determine the size of each drainage area for each point where concentrated flow will leave the site. Drainage areas are portions of the site where runoff will flow in one particular direction or to a particular discharge point. These data will help you select and design the sediment control and storm water management measures for your project in the next phase of the plan. Use the drainage patterns indicated on the site map to determine the drainage areas. (Drainage areas are not required to be included in the pollution prevention plan.)

(C) Calculate the Runoff Coefficient

The general permit requires that you estimate the development's impact on runoff after construction is complete. This is done by estimating a runoff coefficient of the site. The runoff coefficient is an estimate of the fraction of total rainfall that will appear as runoff. (For example, the "c" value of lawn area is 0.2, which indicates that only 20 percent of the water that falls on grassed areas will end up as surface runoff. In contrast, the "c" value of a paved area can be 0.9 or higher, indicating that 90 percent of the rain falling on this type of surface will run off.)

CONTROL SELECTION/PLAN DESIGN PHASE

After you have collected the information and made measurements, the next phase is to design a plan to prevent and control pollution of storm water runoff from your construction site. To complete the Storm Water Pollution Prevention Plan, (A) select erosion and sediment controls, (B) select other controls, (C) select storm water management controls, (D) indicate the location of controls, (E) prepare an inspection and maintenance plan, (F) prepare a description of controls, (G) prepare a sequence of major activities, and (H) incorporate State or local requirements. The following subsections explain how the controls you select should be described in the Storm Water Pollution Prevention Plan.

(A) Select Erosion and Sediment Controls

The Storm Water Pollution Prevention Plan must include a description of the measures to be used for erosion and sediment controls throughout the construction project. These controls include stabilization measures for disturbed areas and structural controls to divert runoff and remove sediment. Erosion and sediment controls are implemented during the construction period to prevent and/or control the loss of soil from the construction site into the receiving waters. Your selection of the most appropriate erosion and sediment controls depends on a number of factors, but is most dependent on site conditions. The information collected in the site evaluation, design and assessment phases is used to select controls. Some controls are discussed below:

- **Stabilization**—The EPA general permit requires that areas of the construction site that were disturbed in the past but will not be redisturbed for 21 days or more be stabilized by the 14th day after the last disturbance. Stabilization measures include the following:
 - **Temporary seeding**—Temporary seeding is the planting of fast-growing grasses to hold down the soil in disturbed areas so that they are less apt to be carried offsite by storm water runoff or wind.
 - **Permanent seeding**—Permanent seeding is the use of permanent vegetation (grass, trees, or shrubs) to stabilize the soil by holding soil particles in place.
 - **Mulching**—Mulching is the placement of material such as hay, grass, woodchips, straw, or gravel on the soil surface to cover and hold in place disturbed soils.
- **Structural control measures include the following:**
 - **Silt fence**—A silt fence is a temporary measure consisting of posts with filter fabric stretched across the posts and sometimes with a wire support fence. The fence is installed along the downslope or sideslope perimeter of a disturbed area. Runoff passes through the openings in the fabric, while sediment is trapped on the uphill side.
 - **Sediment trap**—A sediment trap is formed by excavating a pond or by placing an earthen embankment across a low area or drainage swale. It has an outlet or spillway made of large stones or aggregate. The trap retains the runoff long enough to allow the silt to settle out.
 - **Sediment basin**—A sediment basin is a settling pond with a controlled water release structure, e.g., a riser and pipe outlet with a gravel filter, which slows the release of runoff. The basin detains sediment-laden runoff from larger drainage areas long enough for most of the sediment to settle out.

The EPA general permit requires that a sediment basin be installed in any drainage location where more than 10 acres in the upstream basin are disturbed at one time. The sediment basin must provide at least 3,600 cubic feet of storage for every acre of land that drains to it. For drainage locations with 10 or fewer disturbed acres, sediment traps, filter fences, or equivalent measures must be installed along the downhill boundary of the construction site.

(B) Select Other Controls

In addition to erosion and sediment controls, the Pollution Prevention Plan for your project must address the other potential pollutant sources that may exist on a construction site. They include proper waste disposal, compliance with applicable State or local waste disposal, sanitary sewer or septic system regulations, control of offsite vehicle tracking, and control of allowable non-storm water discharges, as explained in the following bullets:

- **Ensure** proper disposal of construction site waste materials.
- **Treat or dispose of** sanitary wastes that are generated onsite in accordance with State or local requirements. Contact the local government or State regulatory agency.
- **Prevent** offsite tracking of sediments and generation of dust. Stabilized construction entrances or vehicle washing racks should be installed at locations where vehicles leave the site. Where dust is a problem, implement dust control measures such as irrigation.
- **Identify and prevent** contamination of non-storm water discharges. Where non-storm water discharges allowed by the general permit exist, they should be identified and steps should be taken to prevent contamination of these discharges.

(C) Select Storm Water Management Controls

Storm water management controls are constructed to prevent or control pollution of storm water after the construction is completed. The general permit requires that storm water management controls be installed for construction projects where flow rates after construction exceed flow rates before construction. These controls include the following:

- **Retention pond**—A pond that holds runoff in a reservoir without release except by means of evaporation, infiltration, or emergency bypass.
- **Detention pond**—A pond that holds or detains runoff in a basin for a limited time releasing it very slowly allowing most of the sediments to drop out.
- **Infiltration measures**—Measures that allow the percolation of water through the ground surface into subsurface soil. Specific measures include infiltration trenches, basins, and dry wells.
- **Vegetated swales and natural depressions**—Grass-lined ditches or depressions that transport runoff, filter sediments from the runoff, and enhance infiltration of the runoff.

Selection of the most appropriate storm water management measures depends upon a number of factors, but most of all upon site conditions. EPA expects that most measures can be designed to remove 80 percent of the total suspended solids from post-construction runoff. When you select storm water management measures for a development project, consider the impacts of these measures on other environmental media (i.e., land, air, and ground water). For example, if the water table is unusually high in your area, a retention pond for contaminated storm water could lead to contamination of a ground water source unless special preventive measures are taken. EPA strongly discourages the transfer of pollution from one environmental medium to another and prohibits the adoption of any storm water management practice that results in a violation of other Federal, State, or local environmental laws.

In addition to pollutant removal, the storm water management portion of the plan must address velocity dissipation at discharge locations. Development usually means an increase in speed with which the site will drain because of the addition of paved areas, storm sewers, curbs, gutters, etc. The general permit requires that velocity dissipation devices be placed along the length of any outfall where erosive conditions exist. The potential for erosion is

primarily dependent upon the velocity of the storm water discharge and the type of material that lines the channel. One velocity dissipation device is the **Riprap outlet protection**, which is stone or riprap placed at the discharge point to reduce the speed of concentrated storm water flows.

(D) Indicate the Location of Controls on the Site Map

Pollution prevention measures must be shown on the pollution prevention site map, including the location of each measure used for erosion and sediment control, storm water management, and other controls. When this has been done, the site map is ready to be included in the Pollution Prevention Plan. Note: It may not be feasible to indicate some controls on the site map, e.g., waste control measures.

(E) Prepare an Inspection and Maintenance Plan

After the Storm Water Pollution Prevention Plan is prepared and the necessary controls are installed, you will be responsible for inspecting and maintaining them. The general permit requires that you prepare a description of the procedures to maintain the pollution prevention measures onsite. An inspection and maintenance checklist indicating each of the control measures proposed for the construction site should be included in the Storm Water Pollution Prevention Plan prior to starting construction.

(F) Prepare a Description of Controls

Once you have finished planning your construction activities and selected the controls, make a list of each type of control you plan to use on the site. Include a description of each control, describe its purpose, and explain why it is appropriate in this location. The description should also include specific information about the measure such as size, materials, and methods of construction. Read your permit carefully to ensure that your plan includes all of the required controls.

(G) Prepare a Sequence of Major Activities

You should prepare a sequence of major activities that includes the installation of all the controls, earth disturbing activities, all stabilization activities, and the maintenance required for the controls. The sequence should clearly indicate the order in which each of the activities described takes place. Several general principles are helpful in developing the sequence of major activities:

- **Install** downslope and sideslope perimeter controls before the land disturbing activity occurs.
- **Do not disturb** an area until it is necessary for construction to proceed.
- **Cover** or **stabilize** disturbed areas as soon as possible.
- **Time** activities to limit impact from seasonal climate changes or weather events.
- **Delay** construction of infiltration measures until the end of the construction project when upstream drainage areas have been stabilized.
- **Do not remove** temporary perimeter controls until after all upstream areas are finally stabilized.

(H) Incorporate State or Local Requirements

The plan must be in compliance with applicable State or local storm water management, erosion, and sediment control requirements. This is done by incorporating the State or local requirements (by reference) into the plan,

thereby allowing States and localities the flexibility to maintain their existing programs and providing additional authority for enforcement.

The State or local erosion and sediment control or storm water management program requirements may be identical to requirements in the general permit. Some of them could be different. The Storm Water Pollution Prevention Plan components of an NPDES storm water permit ensure that a minimum level of pollution prevention is required.

CERTIFICATION AND NOTIFICATION PHASE

Once the site description and controls portion of the Storm Water Pollution Prevention Plan have been prepared, you now must (A) certify the pollution prevention plan and (B) submit a Notice of Intent to the appropriate agency. The checklist provided at the end of this document will be very useful in evaluating whether all the required items are included in your Storm Water Pollution Prevention Plan prior to certifying the plan or submitting a Notice of Intent.

(A) Certify the Pollution Prevention Plan

Construction activities often have a number of different short-term contractors and subcontractors coming onsite during each phase of the project development. The EPA general permit requires that the contractors and subcontractors responsible for implementing measures in the Pollution Prevention Plan be listed in the plan and that they sign a certification statement that they understand the permit requirements. This requirement holds each contractor/subcontractor responsible for certain permit conditions.

Your plan should identify the **Authorized representative**. The authorized representative should be someone at or near the top of the management chain, such as the president, vice president, or a general partner, who has been delegated the authority to sign and certify this type of document. In signing the plan, the authorized representative certifies that the information is true and assumes liability for the plan. Please note that Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, permit requirements.

(B) Submit a Notice of Intent

The General Permit for Storm Water Discharges Associated with Industrial Activity from Construction Activities requires that you submit a Notice of Intent (NOI) at least 48 hours before construction activities begin. The NOI is essentially an application and contains important information about your site, including site location, owner information, operator (general contractor) information, receiving water(s), existing NPDES Permit Number (if any), existing quantitative data, and a brief description of the project.

EPA has developed a one-page form to be used by industrial facilities and construction activities when they submit NOIs. This form indicates all the information that you are required to provide and must be used in order for the NOI to be processed correctly. NOIs for the EPA General Permit will be submitted directly to EPA's central processing center at the following address:

Storm Water Notice of Intent
P.O. Box 1251
Newington, VA 22122

The party or parties who have day-to-day responsibilities for site operations, and the party or parties who have control over the designs and specifications necessary to ensure compliance with plan requirements and permit conditions, must submit an NOI. It is anticipated that there will be projects where more than one entity (e.g., the owner, developer, or general contractor) will need to submit an NOI so that both of the requirements for an operator are met. In this case, those persons will become co-permittees.

Deadlines—There are different deadlines for submitting NOIs depending on whether the construction starts before or after October 1, 1992.

- **Before October 1, 1992**—For construction activities that have started before October 1, 1992, and plan to continue beyond this date, the NOI must be submitted on or before October 1, 1992.
- **After October 1, 1992**—If construction will not begin until after October 1, 1992, a NOI must be postmarked at least 48 hours before construction begins.
- The Storm Water Pollution Prevention Plan must be completed prior to the submittal of an NOI.

CONSTRUCTION/ IMPLEMENTATION PHASE

Once you have prepared a Storm Water Pollution Prevention Plan and filed a Notice of Intent, you may then start construction of the project. However, you have not yet met all requirements of your permit. You should now do the things that you said you would do in the Storm Water Pollution Prevention Plan: (A) implement the controls, (B) inspect and maintain the controls, (C) maintain records of construction activities, (D) update/change the plan to keep it current, (E) take proper action when there is a reportable quantity spill, and (F) have plans accessible.

(A) Implement Controls

The first action that should be taken is to construct or perform the controls that were selected for the Storm Water Pollution Prevention Plan. The controls should be constructed or applied in accordance with State or local specifications. If there are no State or local specifications for control measures, then the controls should be constructed in accordance with good engineering practices. The controls should be constructed and the stabilization measures should be applied in the order that you indicated in the sequence of major activities.

To ensure that controls are adequately implemented, it is important that the work crews who install the measures are experienced and/or adequately trained. Improperly installed controls can have little or no effect and may actually increase the pollution of storm water. It is also important that all other workers on the construction site be made aware of the controls so that they do not inadvertently disturb or remove them.

(B) Inspect and Maintain Controls

As discussed previously, inspection and maintenance of the protective measures that are part of this plan are as important to pollution prevention as proper planning, design/selection, and installation.

- **Inspection**—The EPA General Permit requires inspection every 7 days or within 24 hours of a storm of 0.5 inches in depth. All disturbed areas of the site, areas for material storage, and all of the erosion and sediment controls that were identified as part of the plan should be inspected. Controls must be in good operating condition until the area they protect has been completely stabilized and the construction activity is complete.
- **Maintenance/repairs**—The inspector should note any damages or deficiencies in the control measures on an inspection report form provided for this purpose. These reports document the inspection of the pollution prevention measures. These same forms can be used to request maintenance and repair and to prove that inspection and maintenance were performed. The operator should correct damage or deficiencies as soon as practicable after the inspection, and any changes that may be required to correct deficiencies in the Storm Water Pollution Prevention Plan should be made as soon as practicable after the inspection.

(C) Maintain Records of Construction Activities

In addition to the inspection and maintenance reports, the operator should keep records of the construction activity on the site. In particular, the operator should keep a record of the following information:

- The dates when major grading activities occur in a particular area
- The dates when construction activities cease in an area, temporarily or permanently
- The dates when an area is stabilized, temporarily or permanently.

These records can be used to make sure that areas where there is no construction activity will be stabilized within the required timeframe.

(D) Update/Change the Plan

For a construction activity to be in full compliance with its NPDES storm water permit, and for the Storm Water Pollution Prevention Plan to be effective, the plan must accurately reflect site features and operations. When it does not, the plan must be changed. The plan must also be changed if the operator observes that it is not effective in minimizing pollutant discharge from the site.

If, at any time during the effective period of the permit, the permitting authority finds that the plan does not meet one or more of the minimum standards established by the general permit, the permitting authority will notify the permittee of required changes necessary to bring the plan up to standard.

(E) Report Releases of Reportable Quantities

Because construction activities may handle certain hazardous substances over the course of the project, spills of these substances in amounts that equal or exceed Reportable Quantity (RQ) levels are a possibility. EPA has issued regulations that define what reportable quantity levels are for oil and hazardous substances. These regulations are found at 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302. If there is a RQ release during the construction period, then you must take the following steps:

- Notify the National Response Center immediately at (800) 424-8802; in Washington, D.C., call (202) 426-2675.
- Submit a written description of the release to the EPA Regional office providing the date and circumstances of the release and the steps to be taken to prevent another release.
- Modify the pollution prevention plan to include the information listed above.

(F) Provide for Plan Location and Access

The general permit has specific requirements regarding plan location and access.

- **Plan location**—A copy of the Pollution Prevention Plan must be kept at the construction site from the time construction begins until the site is finally stabilized.
- **Retention of records**—Retention of records requires that copies of the Storm Water Pollution Prevention Plan and all other reports required by the permit, as well as all of the data used to complete the NOI be retained for 3 years after the completion of final site stabilization.

- **Access**—Although plans and associated records are not necessarily required to be submitted to the Director, these documents are considered to be "reports" according to Section 308(b) of the Clean Water Act. Upon request, the owner or operator must make these plans available to the Director, or any State or local agency who is approving erosion and sediment control plans, or storm water management plans. If site storm water runoff is discharged to a municipal separate storm sewer system, the plans must be made available upon request to the municipal operator of the system.

FINAL STABILIZATION/ TERMINATION PHASE

Your permit for discharge of storm water associated with a construction activity will remain in effect until the construction is completed. Typically, the storm water discharge associated with an industrial activity is eliminated when the site is finally stabilized. When storm water discharge associated with an industrial activity ceases, the owner/operator of the facility can be relieved of permit by submitting a Notice of Termination.

Final stabilization—The notice of termination (NOT) cannot be submitted until all construction activities for the project have been completed and all areas are finally stabilized. The permit defines final stabilization as uniform perennial vegetative cover with a density of 70 percent or equivalent measures such as riprap for the areas of the site not covered by permanent structures or pavement.

Notice of Termination—The NOT must include the name and address of both the owner and operator, as well as a certification signed by both parties. It will note that construction activities are complete, the site has been finally stabilized, and the site no longer has a discharge associated with an industrial (construction) activity covered under the permit. When the permit is terminated, it will relieve the permittees of their responsibility. EPA has developed a one-page NOT form to be submitted to the same address as the NOI.