
CHAPTER 2

STORM WATER POLLUTION PREVENTION PLAN

The Storm Water Pollution Prevention Plan is the focus of your NPDES storm water permit and is the key to controlling pollutants in storm water discharges. Therefore, proper and careful development and implementation of the plan will maximize the potential benefits of pollution prevention and sediment and erosion control measures. Your permit consists of specific requirements for the plan, including deadlines and certain storm water control measures. This Chapter provides a step-by-step explanation of how to develop and implement your Storm Water Pollution Prevention Plan.

The process of developing and implementing a Storm Water Pollution Prevention Plan for construction activities has been divided into six phases which are indicated in Figure 2.1. These phases are:

1. Site Evaluation and Design Development
2. Assessment
3. Control Selection/Plan Design
4. Certification/Notification
5. Construction/Implementation
6. Final Stabilization/Termination.

The following sections describe the processes involved in each of the phases listed above. The pollution prevention plan is developed during the first three phases listed above.

Your NPDES storm water permit may specify deadlines for plan development and implementation. The sequence in Figure 2.1 assumes that pollution prevention plans will be completed and implemented at the time the project breaks ground and revised (if necessary) as construction proceeds. Your plan should be in place before project initiation because construction operations pose environmental risks as soon as activity begins. The initial rough grading activities may contribute a significant amount of pollutants to storm water runoff. Be sure to read your permit closely to see what dates and deadlines apply to your site.

The planning for pollution prevention measures should be done while you develop the site construction plan. The best Storm Water Pollution Prevention Plans are developed at the same time as the design of the site plan. However, if you have completed your site plan design before you begin to prepare the Storm Water Pollution Prevention Plan it is not necessary to start the process all over again. Much of the information needed for the plan should already be included in your design documents. A Storm Water Pollution Prevention Plan can be prepared for most construction projects by using information from the existing design, and modifying the design to accommodate the controls.

Responsibility for developing a Storm Water Pollution Prevention Plan typically lies with the owner of the property that is being developed, or with the owner and operator (e.g., General Contractor) of the construction project.

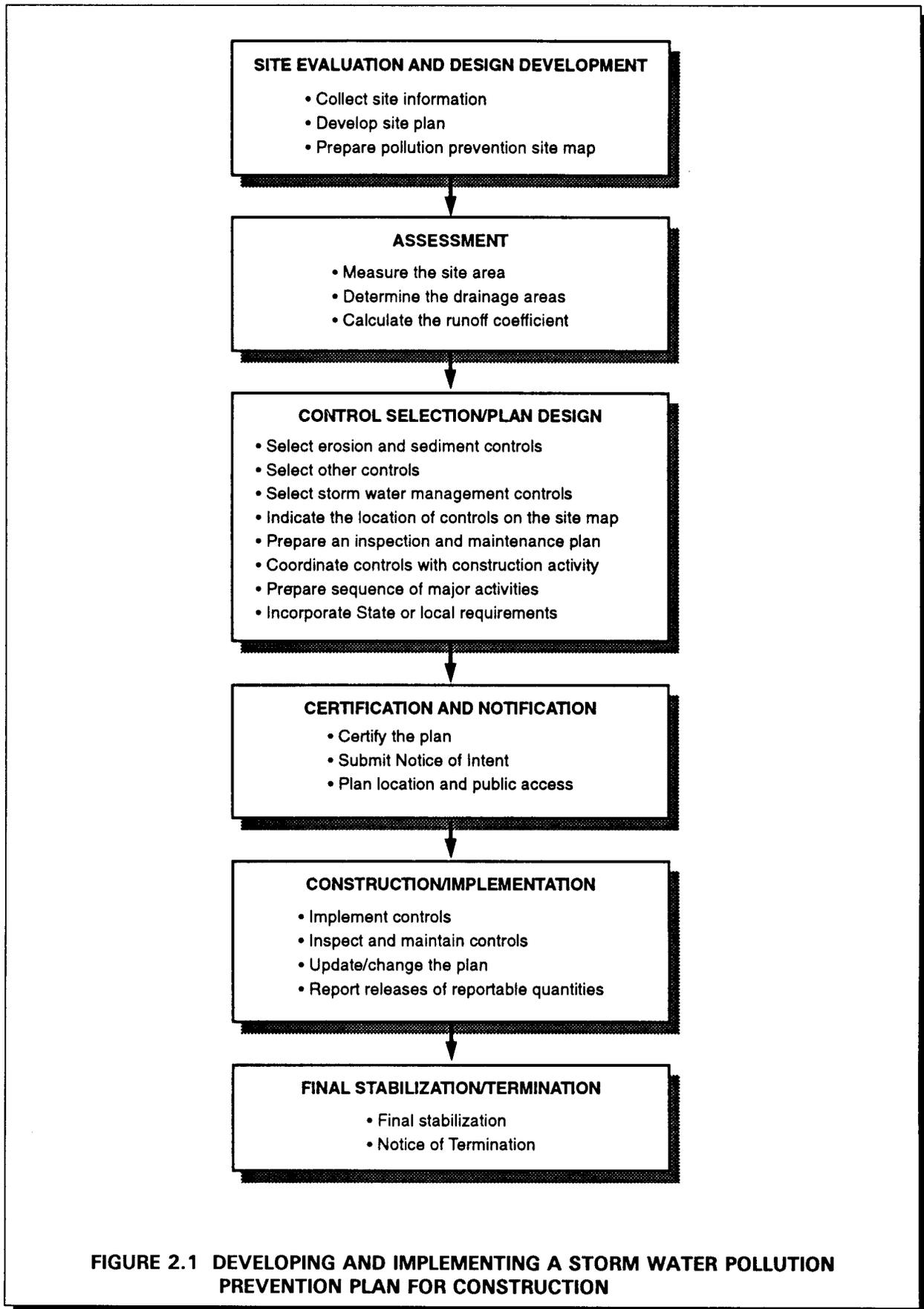


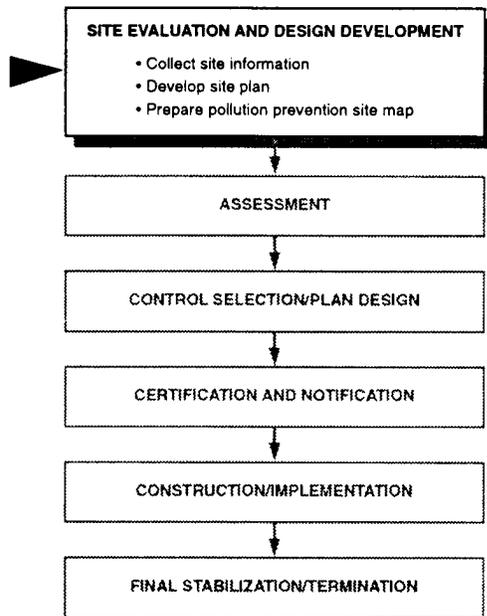
FIGURE 2.1 DEVELOPING AND IMPLEMENTING A STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Storm Water Pollution Prevention Plan Development

Parts IV.A.1, 2, and 3.

Storm Water Pollution Prevention Plans should be fully developed and implemented upon submitting the Notice of Intent (NOI) to be covered by the general permit. The operator should comply with the terms and schedule of the plan beginning with the initiation of construction activities or October 1, 1992, whichever is later. This requirement applies to existing construction sites on October 1, 1992, as well as new sites which begin construction after this date.



2.1 SITE EVALUATION AND DESIGN DEVELOPMENT

The first phase in preparing a Storm Water Pollution Prevention Plan for a construction project is to define the characteristics of the site and of the type of construction which will be occurring. This phase is broken down into three tasks: collect site information, develop site plan, and prepare site map. The following subsections describe each of these tasks.

2.1.1 Collect Site Information

The first phase in preparing a pollution prevention plan is to collect information on the site which will be developed. The following items are suggested.

Existing Conditions Site Map

Obtain a map of the existing conditions at the site. This map will be the starting point for the site map required by the pollution prevention plan. The map should be to scale and preferably topographic. The map should indicate the existing land use for the site (i.e., wooded area, open grassed area, pavement, building, etc.) as well as the location of surface waters which are located on or next to the site (Surface waters include wetlands, streams, rivers, lakes, ponds, etc.). The best way to obtain a site map is to have your site surveyed by a professional surveyor (either land based or aerial). If it is not practical to survey the site, then topographic maps may be available from your State or local government. A final alternative is to use the United States Geological Survey (USGS) topographical maps. USGS maps are least desirable for use as a site map for a pollution prevention plan because they are only available in a very large scale (1:24,000) and the features of a construction site would be very difficult to distinguish. The scale of the map should be small enough so that you can easily distinguish important features such as drainage swales and control measures.

Soils Information

Determine the type of soils present on the site. This information should be based upon information from your specific site, not regional characteristics. You may use the Soil Conservation Service's (SCS) Soils Map of your area to determine types of soil on your site. The SCS Soil Surveys are excellent sources of information for surface soils and typically will indicate if a soil is erodible. Even more accurate information may be obtained by performing soil borings at the site; this method is more expensive and is usually only required for some storm water practices such as infiltration. Soil borings may already be required for the design of foundations or other structures.

Runoff Water Quality

Collect any information on the quality of the runoff from the site which may be available. In many cases, there will be little water quality data from runoff collected specifically from a site, however, if your construction site is located on or next to an existing industrial facility, or if it drains to a municipal separate storm sewer in a city/county with a population greater than 100,000, water quality data may have been collected which indicates the quality of runoff from your site. Contact either the industrial facility or the municipal storm sewer authority which will receive your storm water and ask if they have performed any analysis on storm water from your proposed construction site. You may also be able to obtain runoff water quality information from the U.S. Geological Survey (USGS), the USDA Soil Conservation Service (SCS), State or local watershed protection agencies. Contact these agencies to see if they have collected samples of runoff from your site or from locations down stream of your site.

Name of Receiving Water

Identify the name of the body of water(s) which will receive runoff from the construction site. If the receiving water is a tributary include the name of the ultimate body of water if possible. Receiving waters could include; rivers, lakes, streams, creeks, runs, estuaries, wetlands, bays, ocean, etc. If the site drains into a Municipal Separate Storm Sewer System, identify the system and indicate receiving water to which the system discharges. This information is usually available from county, State, or USGS maps.

Rainfall Data

It is useful to determine the amount of rainfall you will anticipate in your design of storm water management measures. These rainfall amounts are often referred to as "design storms." Design storms are typically described in terms of the average amount of time that passes before that amount of rain falls again and by the duration of the rain (e.g., the 10 year-24 hour storm). Contact your State/local storm water program agency for additional information on the design storm criteria in your project area. Consult Appendix G for sources of design storm data if it is not available from your State/local agency.

2.1.2 Develop Site Plan

The next step in the process is to develop a preliminary site plan for the facility which is to be constructed. The site plan will be developed primarily based upon the goals and objectives of the proposed facility. However, there are several pollution prevention principals which should be considered when developing the site plan for the project. They are:

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

In addition to reducing pollution in storm water runoff from your site, incorporating the above objectives into the site plan for the project can also: reduce construction costs for grading and

landscaping, reduce the amount of sediment and storm water management controls, and improve the aesthetics of the completed project.

Once the preliminary design is developed, you should prepare a narrative description of the nature of the construction activity to include in the Storm Water Pollution Prevention Plan. The narrative should provide a brief description of the project including the purpose of the project (the final result); the major soil disturbing activities that will be necessary to complete the project; and the approximate length of time it will take to complete the project.

You might describe the purpose of construction (goal or project result) as one of the following; residential development, commercial, industrial, institutional, office development, highway projects, roads, streets, or parking lots, recreational areas, or underground utility.

When you describe soil disturbing activities you might include one or more of the following; clearing and grubbing, excavation and stockpiling, rough grading, final or finish grading, preparation for seeding or planting, excavation of trenches, demolition, etc.

The description of the construction activity does not need to address indoor construction activities that will not have any affect on the quality of storm water. For example, it is not necessary to describe the construction of indoor wiring for a building in the narrative if the wiring will not be installed until after the building is enclosed.

2.1.3 Prepare Site Map

When the site plan is complete for your construction project, the information should be transferred onto the pollution prevention plan site map (Note: the construction site plan and the Storm Water Pollution Prevention Plan site map can be the same map). At this phase in the Storm Water Pollution Prevention Plan development, there are three things which can be indicated on the site map: the approximate slopes after grading, the drainage pattern, and the areas of disturbance. [Note the surface waters should already be indicated on the map (see Section 2.1.1).] Appendix C includes an example site map for a Storm Water Pollution Prevention Plan. It may be helpful to refer to this while reading this section.

Approximate Slopes after Grading

It is suggested that you indicate the revised grades on the same topographic map as the existing grades. You should use two separate symbols for existing contours and proposed contour (i.e., dashed and solid lines). Topographic maps indicating existing and proposed contours for a site are suggested because it is easy to determine the areas which must be disturbed for regrading.

If you do not prepare a topographic map of the site, then you should examine the proposed plan for the site and indicate on the site map the approximate location, direction and steepness of slopes. The location and direction of the slope may be indicated by arrows (pointing from high to low) and numbers indicating the degree of slope. Slope is usually expressed as a ratio of the length it takes to decrease one foot in height, e.g., 3:1 indicates that the slope takes 3 feet in length to drop one foot in height.

Areas of Soil Disturbance

After indicating the proposed grading on the site map, the next phase is to indicate the entire area which will be disturbed by the construction activity. The suggested method for indicating this area is to draw a "limit of disturbance" line on the site plan. You should draw the limit of disturbance

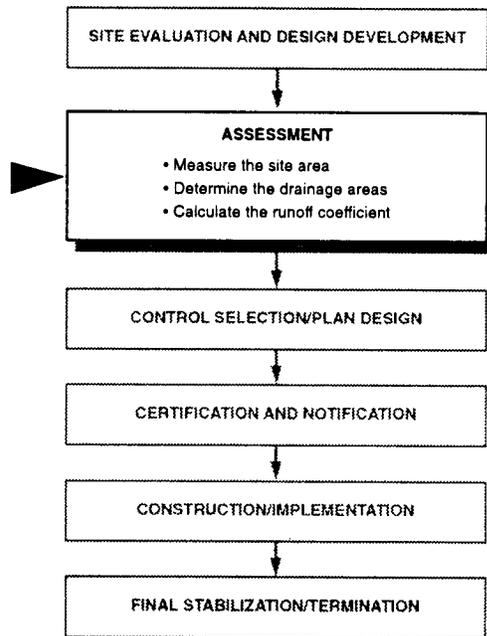
so that any soil disturbing activity such as: clearing, stripping, excavation, backfill, stock piling (topsoil or other fill material), and paving will be inside of the limit. The limit of disturbance should also include roads for construction vehicles unless those roads are paved (or stabilized) and have measures to reduce tracking of sediments. When drawing the line try to leave room for the control structures which may be required (this may be difficult, but you can always redraw the limit of disturbance after you design the control structures). The limit of disturbance should be a closed boundary line around the entire disturbed area. There can be "islands" of undisturbed area inside the limit of disturbance, for example, a tree or group of trees which are to be preserved. These islands should be encircled with a limit of disturbance.

Drainage Patterns

In addition to the slopes anticipated after grading, and areas of soil disturbance your Storm Water Pollution Prevention Plan site map should also indicate the drainage patterns of the site after the major grading activities.

The suggested method for showing this is with a topographic map of the site which indicates drainage basin boundaries and drainage channels or pipes. A drainage basin for the purposes of the Storm Water Pollution Prevention Plan is an area of the site in which water, sediments and dissolved materials drain to a common outlet (such as a swale or storm drain pipe) from the site. There can be one or more drainage basins on a site. Drainage boundaries are closed lines which start and end at the common outlet. Drainage boundaries typically follow the high points on a site including hill tops, ridges, roads, etc. Drainage areas do not overlap. To determine the drainage basin boundaries, ask yourself where will rain falling on this portion flow off of the site. Areas that drain to different points are in different drainage areas. Drainage boundaries can be changed by grading and structural controls. The site map should indicate the drainage boundaries after the major grading has occurred or structural controls installed. It may be necessary to change the drainage boundaries after you select your structural controls. If you do not provide a topographic site map, use arrows to indicate which direction water will flow. 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 then this should be indicated on the Storm Water Pollution Prevention Plan site map as well. It is recommended that the pipe diameter and slope also be included on the site map.

Please note that the Storm Water Pollution Prevention Plan site map is not complete until you have indicated the locations of the major control structures and the areas where stabilization is expected to occur. These items are discussed in Section 3.3.4.



2.2 ASSESSMENT

After 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 from the information developed in phase 1. There are three tasks which should be done to assess the project, they are: measure site area, measure drainage areas, and calculate runoff coefficient.

2.2.1 Measure Site Area

Typically, NPDES storm water permits may require that you indicate in the Storm Water Pollution Prevention Plan estimates of the total site area and the area which will be disturbed. You will need the Storm Water Pollution Prevention Plan site map which clearly shows the site boundary and the limit of disturbance. The area of the site can usually be found on the deed of sale for the property, the record plat, site survey, or the site plan. The amount of area to be disturbed is sometimes noted on a site plan, or grading plan. If the information is not available from one of these sources you may measure using the grid method or by using a planimeter.

The most accurate method to measure area from the site map is with a planimeter. A planimeter is a device which can measure the area on a drawing by tracing its outline. Planimeters are available from Engineering and Surveyor Supply Stores.

If you do not have access to a planimeter and do not wish to buy one, the grid method is an easy method for estimating the size of an area which only requires transparent graph or grid paper. The steps are as follows:

1. Place graph or grid paper over the scale drawing and trace the outline of the entire property.
2. Count the total number of complete squares within the site area, count every two partial squares along the edges of the site as one square.
3. Divide the total number of squares by the number of squares in one square inch of graph/grid paper. This results in an estimate of the number of square inches contained in the outline of the site.
4. Multiply the result of Step 3 by the number of square feet in a one inch square based on the scale of the drawing. This results in an estimate of the number of square feet on the site.

5. The last step is to divide the number of square feet on the site by 43,560 square feet per acre to see how many acres there are. The result is an estimate of the site area in acres. Repeat this method using the outline of the disturbed area to find the estimated acreage of soil disturbing activities.

Example:

The site plan pictured below (Figure 2.2) is drawn to a 1 inch equals 200 feet scale (1":200'). After tracing the boundary and counting the number of squares, the result is 620 1/4-inch squares.

Divide 620 by the number of 1/4-inch squares per square inch, which in this case is 16 (the number of 1/4-inch squares in a square inch is 16). The result is 38.75 one-inch squares.

Multiply 38.75 square inches by the number of square feet per square inch, 40,000 square feet per square inch (based on the scale of this drawing that would be 200' times 200'). The result is 1,550,000 square feet.

The final step is to convert the estimated area from square feet to acres by dividing by 43,560 square feet per acre into the total number of square feet. The final result is 35.6 acres.

The area should be expressed in acres to the nearest tenth of an acre, e.g., 5.5 acres total site area and 3.5 acres disturbed area.

The first measurement which you should make is to determine the total area of the site. The total area of the site should include the area inside the project's property boundaries, easements and/or right-of-ways. The total area includes both the disturbed and undisturbed areas. The second measurement which you should make is the area which will be disturbed by the construction project. This area can be determined by measuring the area enclosed by the limit of disturbance drawn in on the site map (see Section 2.1.2) and subtracting from this value the area of any undisturbed "islands" within the limit of disturbance. The disturbed area should always be less than or equal to the total site area.

2.2.2 Determine the Drainage Areas

The final areas which you should measure are the size of each drainage basins for each point where concentrated flow will leave the site. Although you do not need to put this information into the pollution prevention plan, you will need this data to help you select and design the sediment control and storm water management measures for your project.

For design of the sediment control measures, you will need to know the area of the portion of each drainage basin which will be disturbed. The disturbed areas of the drainage basins should be measured using the methods suggested above to estimate the area enclosed by the limit of disturbance and/or the drainage boundary (whichever boundary gives the smaller area).

For the design of the storm water management controls and for the calculation of the runoff coefficient, you should measure the total area of each drainage basin and the areas of each land use which will occur in the basin after the construction is complete. Be sure to include offsite water draining onto your site when determining the total size of the drainage basin. See Table 2.1 for a listing of different types of land uses. The area of each land use in the drainage basins should be measured using the methods suggested above to estimate the area enclosed by the land use boundary and/or the drainage boundary (whichever boundary gives the smaller area). Topographic maps are helpful tools to use in determining drainage boundaries.

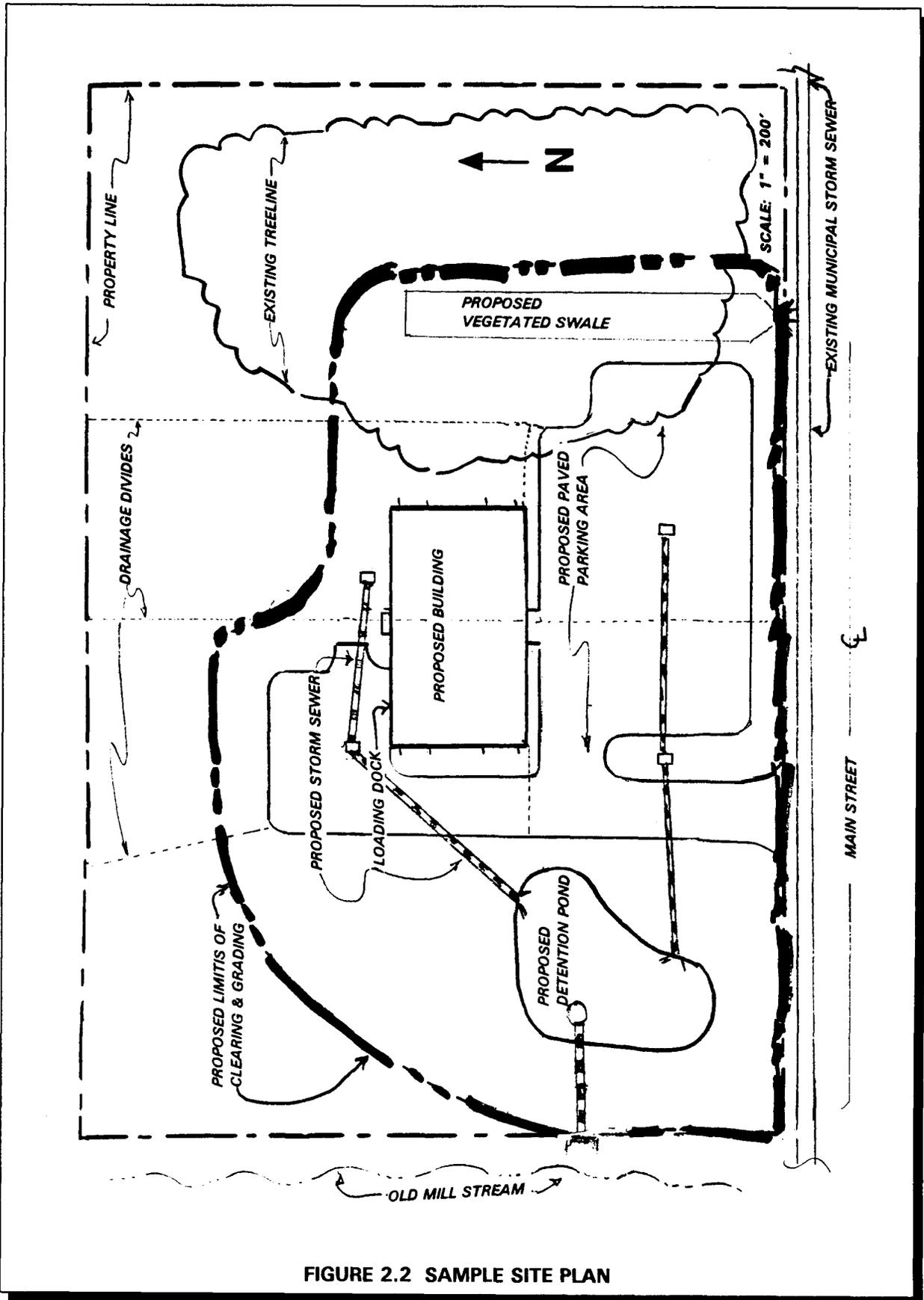


FIGURE 2.2 SAMPLE SITE PLAN

2.2.3 Calculate the Runoff Coefficient

The next step in the assessment phase is to develop an estimate of the development's impact on runoff after construction is complete. This can be done by estimating a runoff coefficient for post construction conditions. The runoff coefficient ("C" value) is the partial amount of the total rainfall which will become runoff. The runoff coefficient is used in the "rational method" which is:

$$Q = CIA,$$

where

Q = the rate of runoff from an area
i = rainfall intensity, and
A = the area of the drainage basin.

There are many methods which can be used to estimate the amount of runoff from a site. You are not required to use the rational method to design storm water conveyances or management measures. Consult your State/local design guides to determine what methods to use for estimating design flow rates from your development.

The less rainfall that is absorbed (infiltrates) into the ground, evaporates, or is otherwise absorbed on site, the higher the "C" value. For example, the "C" value of a lawn area is 0.2, which means that only 20 percent of the rainfall landing on that area will run off, the rest will be absorbed or evaporate. A paved parking area would have a "C" value of 0.9, which means that 90 percent of the rainfall landing on that area will become runoff. The "C" value which you are being asked to calculate is the one that represents the final condition of the site after construction is complete. It is suggested that a runoff coefficient be calculated for each drainage basin on the site. The following is an example of how to calculate the "C" value.

The runoff coefficient or "C" value for a variety of land uses may be found in Table 2.1. These "C" values provide an accurate estimate of anticipated runoff for particular land uses. Most sites have more than one type of land use and therefore more than one "C" value will apply. To have a "C" value that represents your site you will need to calculate a "weighted C value."

Calculating a "Weighted C"

When a drainage area contains more than one type of surface materials with more than one runoff coefficient a "weighted C" must be calculated. This "weighted C" will take into account the amount of runoff from all the various parts of the site. A formula used to determine the "weighted C" is as follows:

$$C = \frac{A_1 C_1 + A_2 C_2 \dots A_x C_x}{\Sigma \text{ of } A}$$

where *A* = acres and *C* = coefficient.

Therefore, if a drainage area has 15 acres (ac.) with 5 paved acres (*C* = .9), 5 grassed acres (*C* = .2), and 5 acres in natural vegetation (*C* = .1), a "weighted "C" would be calculated as follows:

TABLE 2.1 TYPICAL "C" VALUES (ASCE 1960)

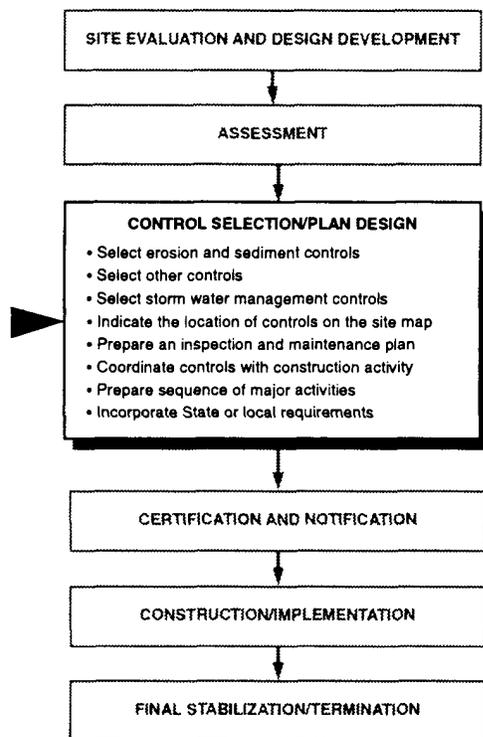
| Description of Area | Runoff Coefficients |
|---|---------------------|
| Business | |
| Downtown Areas | 0.70-0.95 |
| Neighborhood Areas | 0.50-0.70 |
| Residential | |
| Single-family areas | 0.30-0.50 |
| Multiunits, detached | 0.40-0.60 |
| Multiunits, attached | 0.60-0.75 |
| Residential (suburban) | 0.25-0.40 |
| Apartment dwelling areas | 0.50-0.70 |
| Industrial | |
| Light Areas | 0.50-0.80 |
| Heavy areas | 0.60-0.90 |
| Parks, cemeteries | 0.10-0.25 |
| Playgrounds | 0.20-0.35 |
| Railroad yard areas | 0.20-0.40 |
| Unimproved areas | 0.10-0.30 |
| Streets | |
| Asphalt | 0.70-0.95 |
| Concrete | 0.80-0.95 |
| Brick | 0.70-0.85 |
| Drives and walks | 0.75-0.85 |
| Roofs | 0.75-0.95 |
| Lawns - coarse textured soil (greater than 85% sand) | |
| Slope: Flat, 2% | 0.05-0.10 |
| Average, 2-7% | 0.10-0.15 |
| Steep, 7% | 0.15-0.20 |
| Lawns - fine textured soil (greater than 40% clay) | |
| Slope: Flat, 2% | 0.13-0.17 |
| Average, 2-7% | 0.18-0.22 |
| Steep, 7% | 0.25-0.35 |

$$C = \frac{(5 \text{ ac.} \times .9) + (5 \text{ ac.} \times .2) + (5 \text{ ac.} \times .1)}{(5 \text{ ac.} + 5 \text{ ac.} + 5 \text{ ac.})}$$

$$C = \frac{(4.5 \text{ ac.}) + (1.0 \text{ ac.}) + (.5 \text{ ac.})}{(15 \text{ ac.})}$$

$$C = \frac{6.0 \text{ ac.}}{15 \text{ ac.}}$$

$$C = .4$$



2.3 CONTROL SELECTION/PLAN DESIGN

Once you have collected the information and made measurements, the next step is to design a plan to prevent and control pollution of storm water runoff from your construction site. Your Storm Water Pollution Prevention Plan should address: erosion and sediment controls, storm water management controls and other controls. The following subsections detail how the controls which you select should be described in the Storm Water Pollution Prevention Plan; however, the methods of selecting the appropriate measures and detailed information about the measures are contained in the following chapters.

2.3.1 Select Erosion and Sediment Controls

The first types of controls which your pollution prevention plan should address are erosion and sediment controls. 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. Erosion and sediment controls can include temporary or permanent measures.

Your selection of the most appropriate erosion and sediment controls for your construction project depends upon a number of factors, but is most dependent on site conditions. The information collected in the site evaluation, design and assessment steps is used to select controls. Chapter 3 provides a series of questions and answers to assist you in selecting the most appropriate measures for your site. There is also a description of the more commonly used sediment and erosion control measures in Chapter 3 and Appendix B provides typical design information for many of the measures described in Chapter 3. Please use these portions of this manual to help you select and design the sediment and erosion controls for your site.

2.3.2 Select Other Controls

In addition to erosion and sediment controls, the pollution prevention plan for your project should address the other potential pollutant sources which may exist on a construction site. They include: proper waste disposal, control of offsite vehicle tracking, compliance with applicable State or local waste disposal, sanitary sewer or septic system regulations, and control of allowable non-storm water discharges. Chapter 4 describes how you can address each of these topics.

2.3.3 Select Storm Water Management Controls

The final controls which should be addressed in the Storm Water Pollution Prevention Plan are storm water management controls. Storm water management controls are constructed to prevent or control pollution of storm water after the construction is completed. These controls include retention ponds, detention ponds, infiltration measures, vegetated swales, and natural depressions.

As with erosion and sediment controls, your selection of the most appropriate storm water management measures is dependent upon a number of factors, but is most dependent on site conditions. The information collected in the site evaluation, design and assessment steps is used to select controls.

2.3.4 Indicate Location of Controls on the Site Map

Once the pollution prevention controls have been selected, they should be indicated on the site map. Provide the location of each measure used for erosion and sediment control, storm water management and other controls. Below is a list of typical BMPs which illustrate the kinds of controls which you should include on the site map.

Erosion and Sediment Control

- Areas of permanent seeding
- Areas of sod stabilization
- Areas of geotextile stabilization
- Silt fence
- Straw bale barrier
- Earth dikes
- Brush barriers
- Drainage swales
- Sediment traps
- Pipe slope drains
- Level spreaders
- Storm drain-inlet protection
- Reinforced soil retaining systems
- Gabions
- Temporary or permanent sediment basins
- Stabilized construction entrances

Storm Water Management Controls

- Storm water detention structures (including wet ponds)
- Storm water retention structures
- Open vegetated swales
- Natural depressions
- Infiltration measures

The above list may not include every possible control measure. If your plan includes a measure not on this list, you should still indicate it on the site map if possible. It may not be feasible to indicate some controls on the site map, for example it would be very difficult to indicate appropriate waste control on the site map.

Once you have indicated the controls on the site map, it may be necessary to revise the limit of disturbance and/or the drainage boundaries. The limit of disturbance should be indicated outside of any perimeter control, because the construction of most controls does require some soil disturbance. Drainage boundaries are often impacted by diversion structures. This is because the intent of a diversion device is typically to divert runoff from one drainage basin to another. The drainage patterns on the site map should reflect the drainage patterns on the site while the controls are in place.

Once the location of the controls are indicated, the site map is ready to be included in the pollution prevention plan. The table below summarizes the items which are typically required to be indicated on the Storm Water Pollution Prevention Plan site map.

| EPA BASELINE GENERAL PERMIT REQUIREMENTS |
|--|
| <p style="text-align: center;">Storm Water Pollution Prevention Plan Site Plan Requirements Part IV.D.1.e.</p> <p>The site map shall indicate:</p> <ul style="list-style-type: none">• Drainage patterns• Approximate slopes after grading• Area of soil disturbance• Location of major structural and nonstructural controls• Areas where stabilization practices are expected to occur• Location of surface waters. |

2.3.5 Prepare Inspection and Maintenance Plan

Once the Storm Water Pollution Prevention Plan is put into effect, you will be responsible for inspecting and maintaining the controls you have proposed to prevent and control pollution of storm water on the construction site.

It is important for you to plan for the inspection and maintenance of vegetation, erosion and sediment control measures and other protective measures which are part of this plan. These controls must be in good operating condition until the area they protect has been completely stabilized or the construction project is complete.

It is recommended that you prepare an inspection and maintenance checklist which addresses each of the control measures proposed for the facility. A blank checklist for your facility could be included in the Storm Water Pollution Prevention Plan prior to starting construction. The inspector could complete a copy of the blank checklist during each inspection. The inspection and maintenance checklist should be prepared based upon the requirements for each individual measure. For example, sediment must be removed from a silt trap when it has filled to one third of its depth. Consult your State/local manuals or Appendix C for maintenance requirements for control measures. Appendix B contains a sample blank Inspection and Maintenance Checklist.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Maintenance and Inspection Requirements

Parts IV.D.3. and IV.D.4.

Pollution Prevention Plan shall include:

- A description of procedures to maintain in good condition and effective operating condition
 - Vegetation
 - Erosion and sediment control measures
 - Other protective measures identified in the site plan
- Qualified personnel shall inspect disturbed areas of the construction site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater.

2.3.6 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 in this list a description of each control and what its purpose is and 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.

2.3.7 Coordinate Controls with Construction Activity

You also should prepare a sequence of major activities that lists all of the tasks required for: construction of control measures, earth disturbing construction activities, and maintenance activities for control measures in the order in which they will occur. Specific timing requirements for installation and maintenance of control measures are dependent upon the measures and/or the construction activities. Refer to Chapters 3, 4 and 5 for specific timing information on your site's controls. There are, however, several general principles which you should keep in mind when developing the sequence of major activities. These principals are:

1. Downslope and sideslope perimeter controls should be installed before the land disturbing activity occurs.
2. Do not disturb an area until it is necessary for construction to proceed.
3. Cover or stabilize as soon as possible.
4. Time activities to limit impact from seasonal climate changes or weather events.
5. Construction of infiltration measures should be delayed to the end of the construction project when upstream drainage areas have been stabilized.

6. Do not remove temporary perimeter controls until after all upstream areas are stabilized.

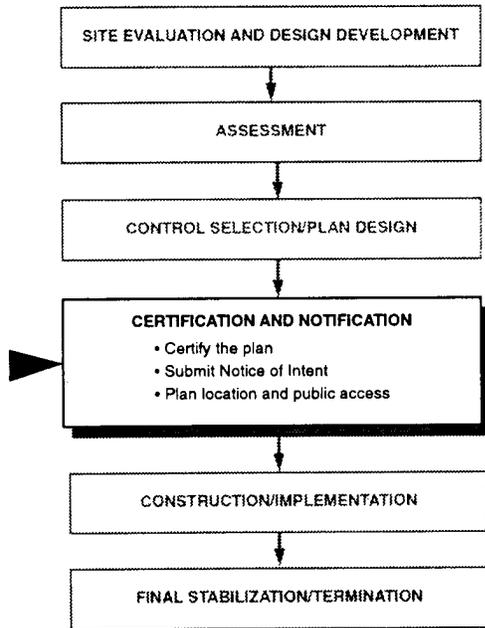
Appendix B contains a sample description of controls and sequence of major activities.

2.3.8 Incorporate State or Local Requirements

Construction operations are often subject to State or local sediment and erosion or storm water management program requirements in addition to any requirements in the site's NPDES storm water permit. It is very likely that these State and local requirements will overlap with your site's Storm Water Pollution Prevention Plan requirements. However, since not all localities have such programs, or the programs do not meet the standards set by your NPDES storm water permit, overlap may be limited. Therefore, because State and local programs can vary significantly from locality to locality, the Storm Water Pollution Prevention Plan components of an NPDES storm water permit ensure that a minimum level of pollution prevention is required. Where a construction site has taken measures to comply with State and local requirements, and these measures fulfill requirements of the Storm Water Pollution Prevention Plan conditions, the applicable measures may be incorporated into the plan.

The Permit may require that any State and local sediment and erosion control or storm water management requirements be incorporated by reference into the plan. This approach allows States and localities the flexibility to maintain their existing programs and provides additional authority for enforcement. Therefore, you should check the requirements of your permit to determine if you must include a copy of a sediment and erosion control and/or storm water management plan which is approved by a State or local authority.

| EPA BASELINE GENERAL PERMIT REQUIREMENTS |
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| <p>Permit Requirements for State/Local Plans</p> <p>Part IV.D.2.d.(1).</p> <p>Permittees shall incorporate all applicable requirements specified in State or local sediment and erosion control plans or permits, or storm water management plans or permits. The permittee must provide a certification that their Pollution Prevention Plan reflects these requirements, and permittees shall comply with these requirements during the term of the permit.</p> |



2.4 CERTIFICATION AND NOTIFICATION

Once the site description and controls portion of the Storm Water Pollution Prevention Plan have been prepared then you now can certify the pollution prevention plan. If you intend to be included under the general permit, then you should submit a notice of intent to the appropriate agency.

It is recommended that you read your permit carefully to evaluate whether or not all the required items are included in your Storm Water Pollution Prevention Plan prior to certifying the plan or submitting a Notice of Intent.

2.4.1 Certification

In order to ensure that your site's Storm Water Pollution Prevention Plan is completely developed and adequately implemented, your NPDES storm water permit will typically require that authorized representative(s) of the operator(s) sign and certify the plan. The authorized representative(s) should be individuals 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(s) certifies that the information is true and assumes liability for the plan.

Official signatures provide a basis for an enforcement action to be taken against the person signing the document. The permittee should be aware that Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, its permit requirements. Specific signatory requirements for the Storm Water Pollution Prevention Plan will be listed in your NPDES storm water permit.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Signature Requirements

Parts V.B. and VI.G.

All reports, certifications, or information either submitted to the Director or to the operator of a large or medium municipal separate storm sewer system, or required to be maintained by the permittee onsite shall be signed according to the following details:

Parts VI.G.1.a., b., and c.

- For a corporation, the plan must be signed by a "responsible corporate officer." A responsible corporate officer may be any one of the following:
 - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation
 - The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25,000,000 (in second quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedure.
- For a partnership or sole proprietorship, the plan must be signed by a general partner or the proprietor, respectively.
- For a municipality, State, Federal, or other public agency, the plan must be signed by either:
 - The principal executive officer or ranking official, which includes the chief executive officer of the agency, or
 - The senior officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional EPA Administrators).

Designating Signatory Authority

Parts VI.G.2.a., b., and c.

Any of the above persons may designate a duly authorized representative to sign for them. The representative may either be a particular individual or a particular named position. If an authorized representative is appointed, the authorization must be put in writing by the responsible signatory and submitted to the Director. Any change in an authorized individual or an authorized position must be made in writing and submitted to the Director.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Reports/Documents Certification Requirements

Part VI.G.2.d.

Any person signing documents under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Construction activities typically have contractors or subcontractors who are responsible for implementing the controls specified in the plan, but may not have the authority to design or modify the plan. Many NPDES permits will require that these contractors certify that they understand the requirements of the permit and the plan.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Requirements for Contractors and Subcontractors

Parts IV.E.1. and IV.E.2.

The site's Storm Water Pollution Prevention Plan shall provide a list of all contractors and subcontractors who will implement the measures identified in the plan. In addition, these contractors and subcontractors shall sign a certification statement and provide their names, addresses, and telephone numbers. These certifications shall be signed before the contractor begins activities and shall be filed with the site's Storm Water Pollution Prevention Plan.

The following statement shall be signed in accordance with the signatory requirements described above.

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

2.4.2 Notice of Intent

If you intend to include your project under a General Permit for Storm Water Discharges Associated With Industrial Activity from Construction Activities, then you are typically required to submit an NOI prior to commencement of construction. Consult your permit to determine the exact deadline for submitting an NOI. It should be noted that typically the NOI cannot be submitted until the Storm Water Pollution Prevention Plan has been prepared.

In cases where more than one party meets the definition of an "operator" of a construction activity (see Section 1.3 or consult your permit), all of those parties may need to submit an NOI and become co-permittee's.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Notice of Intent Requirements

Parts II.A.2 and II.B.

Individuals who intend to obtain coverage for storm water discharges from a construction site (where disturbances associated with the construction project begin after October 1, 1992) shall submit an NOI at least 2 days prior to the commencement of construction.

The NOI should include:

1. The mailing address of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location of the approximate center of the site must be described in terms of the latitude and longitude to the nearest 15 seconds, or the section, township and range to the nearest quarter;
2. The name, address and telephone number of the operator(s) with day to day operational control that have been identified at the time of the NOI submittal, and operator status as a Federal, State, private, public or other entity. Where multiple operators have been selected at the time of the initial NOI submittal, NOIs must be attached and submitted in the same envelope. When an additional operator submits an NOI for a site with a preexisting NPDES permit, the NOI for the additional operator must indicate the number for the preexisting NPDES permit;
3. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s);
4. The number of any NPDES permit for any discharge (including non-storm water discharges) for the site that is currently authorized by an NPDES permit.
5. An indication of whether the facility has existing quantitative data describing the concentration of pollutants in the storm water discharge available (existing data should not be included as part of the NOI); and
6. An estimate of project start date and completion dates, estimates of the number of acres of the site on which soil will be disturbed, and a certification that a storm water pollution prevention plan has been prepared for the site in accordance with Part IV of this permit, and such plan provides compliance with approved State and/or local sediment and erosion plans or permits and/or storm water management plans or permits in accordance with Part IV.D.2.d of this permit. (A copy of the plans or permits should not be included with the NOI submission).

2.4.3 Plan Location and Public Access

Submittal Requirements/Plan Location

Some NPDES storm water permits for construction sites may require that Storm Water Pollution Prevention Plans be submitted to the Director for review, whereas other permits may only require that plans be maintained onsite. Permitting authorities may prefer not to require plans to be submitted to reduce the administrative burden of reviewing a large number of pollution prevention plans. However, when the Director requests the plan, permittees should submit it in a timely manner. In addition, when requested, permittees should also submit their plan to State or local sediment and erosion or storm water management agencies, or to a municipal operator where the site discharges through an NPDES storm water permitted municipal separate storm sewer system. Examine your permit carefully to determine what requirements apply to your facility regarding submitting plans.

Regardless of whether or not the Storm Water Pollution Prevention Plan should be submitted to the permitting authority or other public agency, site operators are expected to keep the plan and supporting materials at the site of the construction operations at all times throughout the project. In maintaining plans onsite, you should keep all records and supporting documents compiled together in an orderly fashion. Your permit may require that all records be maintained for a certain period of time after the project is completed. This provision ensures that all records are available in case a legal situation arises for which documentation is necessary.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

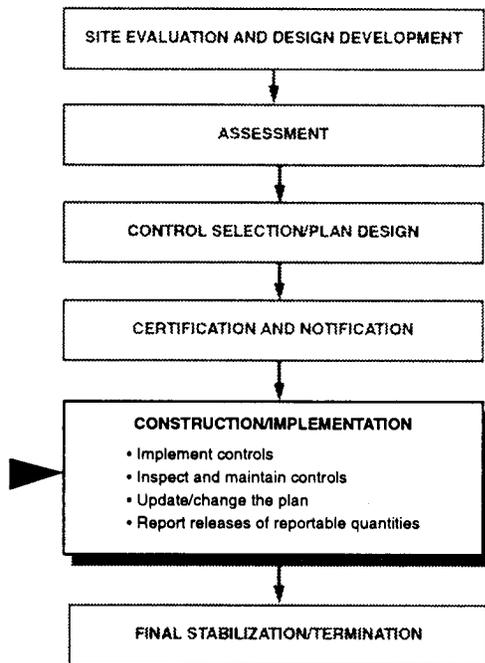
Submittal/Plan Location Requirements

Parts IV.B. and V.A., B.

Storm Water Pollution Prevention Plans for construction activities shall be maintained onsite of the activity unless the Director, or authorized representative, the operator of a large or medium municipal separate storm sewer system, or a State or local sediment and control agency requests that the plan be submitted. Permittees should keep a copy of the plan at the construction site until the site is finally stabilized. In addition, permittees are required to keep the plan, all reports and data for at least three years after the project is complete.

Public Access

Despite the fact that 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, and therefore, are available to the public. Your permit may require you to provide copies of your plan to your permitting authority, municipal operator, or State or local agency upon request. However, permittees may claim certain portions of their Storm Water Pollution Prevention Plan as confidential according to the regulations at 40 CFR Part 2. Basically, these regulations state that records which contain trade secret information may be claimed as confidential.



2.5 CONSTRUCTION/IMPLEMENTATION

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 are not finished meeting the requirements of your permit. You should now do the things which you said you would do in the Storm Water Pollution Prevention Plan.

2.5.1 Implement Controls

The first step you should take is to construct or perform the controls which were selected for the Storm Water Pollution Prevention Plan. The controls should be constructed or applied in accordance with State or local standard specifications. If there are no State or local specifications for control measures then the controls should be constructed in accordance with good engineering practices. Appendix B of this manual lists typical design standards for structural control measures. The controls should be constructed and the stabilization measures applied in the order which you indicated in the sequence of major activities.

To ensure that controls are adequately implemented, it is important that the work crews which 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.

2.5.2 Inspect and Maintain Controls

Inspection and maintenance of the control measures is as important to pollution prevention as proper planning and design. Chapter 5 describes in further detail the inspection and maintenance activities which should be performed. Inspection should be performed at the frequency specified in the Storm Water Pollution Prevention Plan and/or the permit. The inspector should note any damage or deficiencies in the control measures in an inspection report. 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.

2.5.3 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 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.

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

2.5.4 Changing the Plan

In order for a construction activity to be in full compliance with its NPDES storm water permit, and in order for the Storm Water Pollution Prevention Plan to be effective, the plan should be consistent with permit conditions, and the plan should accurately reflect site features and operations. Should either of these conditions not be met by the plan, the plan should be changed.

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 pollution prevention plan requirements, the permitting authority will notify the permittee of required changes necessary to bring the plan up to standard.

Storm Water Pollution Prevention Plans are developed based on site-specific features and functions. Where there are changes in design, construction, operation, or maintenance, and that change will have a significant effect on the potential for discharging pollutants in storm water at a site, the Storm Water Pollution Prevention Plan should be modified by the permittee to reflect the changes and new conditions. For example, a change in the construction schedule or design specifications should be incorporated in the Storm Water Pollution Prevention Plan. Another situation in which the plan should be modified is where the plan proves to be ineffective in controlling pollutants. This determination could be made based on the results of regular visual inspections (see Chapter 5).

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Requirements for Storm Water Pollution Prevention Plan Changes

Parts IV.B.3. and IV.C.

Any changes required by the permitting authority shall be made within 7 days of the notification or an individual application should be submitted, unless otherwise provided by the notification. The permittee should submit a certification to the permitting authority that the requested changes have been made. The Storm Water Pollution Prevention Plan requirements also specify that the permittee to update the plan as necessary to reflect any changes onsite which may affect the potential for discharges of pollutants from the site.

2.5.5 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 which 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 (see Appendix F for a complete list). For oil, if you detect an oily sheen in your storm water runoff, then you have exceeded the reportable quantity level. For hazardous substances, the RQ levels depend on the chemical. For example, for dieldrin, a pesticide, the level is 1 kilogram (kg). If you spill or otherwise release one or more kg of dieldrin, then you have exceeded the RQ threshold. Spill events such as these can be avoided if your site's Storm Water Pollution Prevention Plan addresses this possibility. Chapter 5 discusses spill prevention and control. To do this, your permit may require a description of potential spill areas in your site description or a description of specific procedures to respond to and clean up a spill. Another possibility would be for your permit to establish a RQ release as a trigger for more stringent requirements, such as a requirement to submit an individual application.

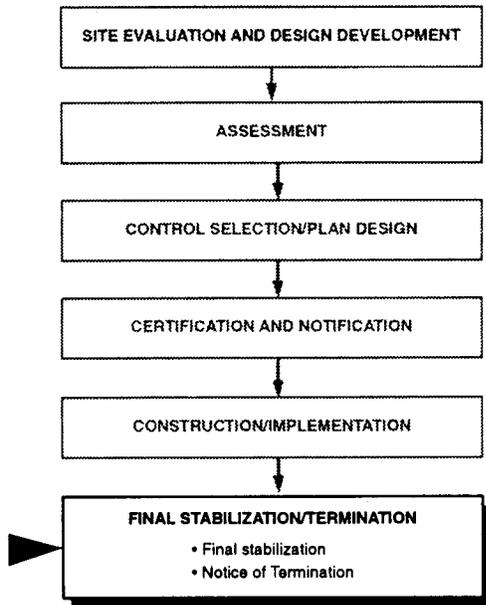
EPA BASELINE GENERAL PERMIT REQUIREMENTS

Requirements for Reporting Spills

Part III.B.

If the construction site has a release of a hazardous substance or of oil in an amount which exceeds a reportable quantity (RQ) as defined at 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 (see Appendix F for a complete list), then the permittee shall do several things:

- The person in charge of the site at the time of the spill shall call the National Response Center to report the spill (800-424-8802, or 202-426-2675);
- Within 14 days after the release is detected, modify the site Storm Water Pollution Prevention Plan. The modification shall include: a description of the release; the date of the release; an explanation of why the spill happened; a description of procedures to prevent future spills and/or releases from happening; and a description of response procedures should a spill or release occur again; and
- Within 14 days of the release, submit a written description of the release including: a description of the release, including the type of material and an estimated amount of spill; the date of the release; an explanation of why the spill happened; and a description of the steps taken to prevent and control future releases.



2.6 FINAL STABILIZATION/TERMINATION

Your permit for discharge of storm water associated with a construction activity may remain in effect until the discharge is eliminated. This does not mean when the storm water discharge is eliminated but that 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 permit may allow the owner/operator of the facility to cease coverage by submitting a Notice of Termination.

2.6.1 Final Stabilization

As soon as practicable after construction activities have been completed in a disturbed area, permanent stabilization should be started to prevent further erosion of soil from that area. All disturbed areas of a site (except those portions which are covered by pavement or a structure) should be finally stabilized once all construction activities are completed. Final stabilization requirements may vary from permit to permit. Read your permit to determine exactly what constitutes final stabilization.

| EPA BASELINE GENERAL PERMIT REQUIREMENTS |
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| <p>Final Stabilization Requirements</p> <p>Part IX.</p> |
| <p>A site can be considered finally stabilized when all soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of 70 percent for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been employed.</p> |

2.6.2 Notice of Termination

The Notice of Termination is typically the final task required to comply with the requirements of an NPDES storm water permit for a construction activity. The Notice of Termination communicates to the permit enforcement agency that the construction activity has ceased and the area is stabilized. Your permit may list the requirements for Notice of Termination. Check the permit to see what information is required and when it may be submitted.

EPA BASELINE GENERAL PERMIT REQUIREMENTS

Notice of Termination Requirements

Part VIII.A.

Notice of Termination shall include:

1. The mailing address of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location of the approximate center of the site must be described in terms of the latitude and longitude to the nearest 15 seconds, or the section, township and range to the nearest quarter;
2. The name, address and telephone number of the operator addressed by the Notice of Termination;
3. The NPDES permit number for the storm water discharge identified by the Notice of Termination;
4. An indication of whether the storm water discharges associated with industrial activity have been eliminated or the operator of the discharges has changed; and
5. The following certification signed in accordance with Part VI.G. (signatory requirements) of this permit:

"I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have been eliminated or that I am no longer the operator of the construction activity. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by an NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

For the purposes of this certification, elimination of storm water discharges associated with industrial activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated.

2.7 SUMMARY

This chapter has tried to describe the components of an effective Storm Water Pollution Prevention Plan for construction activities. The process of developing and implementing a Storm Water Pollution Prevention Plan has been described on a step-by-step basis in the order that the plan should be assembled. Table 2.2 summarizes the components of a Storm Water Pollution Prevention Plan and indicates where these components are described.

TABLE 2.2 SUMMARY OF STORM WATER POLLUTION PREVENTION PLAN COMPONENTS FOR CONSTRUCTION ACTIVITIES

| Component | See Section: | Further Information Available In |
|---|-----------------|----------------------------------|
| a. SITE DESCRIPTION | | |
| (1) Description of the nature of construction activity | 2.1.2 | |
| (2) Estimate of total area of the site and of the area expected to be disturbed | 2.2.1 | |
| (3) Runoff coefficient | 2.2.3 | |
| (4) Site map including: | | |
| • Drainage patterns | 2.1.1 | |
| • Approximate slopes | 2.1.3 | |
| • Area of soil disturbance | 2.1.3 | |
| • Location of structural and nonstructural controls | 2.3.4 | Chapters 3, 4, and 5 |
| • Location of stabilization practices | 2.3.4 | Chapter 3 |
| • Surface waters (Type) | 2.1.1 | |
| (5) Receiving waters (Name) | 2.1.1 | |
| b. DESCRIPTION OF CONTROLS | | |
| Sequence of major activities | 2.3.6 | |
| Timing for each control measure | 2.3.6 | Chapters 3, 4, and 5 |
| (1) Erosion and Sediment Controls | | Chapter 3 |
| (a) Description of Stabilization Practices | 2.3.1 and 2.3.6 | Chapter 3 |
| (b) Description of Structural Practices | 2.3.1 and 2.3.6 | Chapter 3 |
| (2) Storm water management | 2.3.2 and 2.3.6 | |
| (3) Other controls | 2.3.3 and 2.3.6 | Chapter 4 |
| (4) Approved State or local plans | 2.3.7 | Chapter 3 |
| (5) Description of maintenance | 2.3.5 | Chapter 5 |
| (6) Inspectors | | |
| (b) Changes to the plan | 2.5.3 | |
| (c) Inspection reports | 2.5.2 and 2.3.5 | Chapter 5 |
| 5. Non-Storm Water Discharges | | |
| Description of controls for non-storm water discharges | 2.3.6 | Chapter 5 |
| 6. Industrial activities onsite | 2.1.3 | |
| 7. Contractors | | |
| Certification | 2.4.1 | |