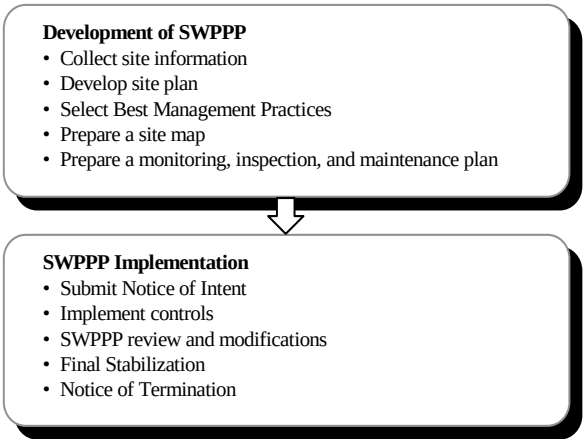
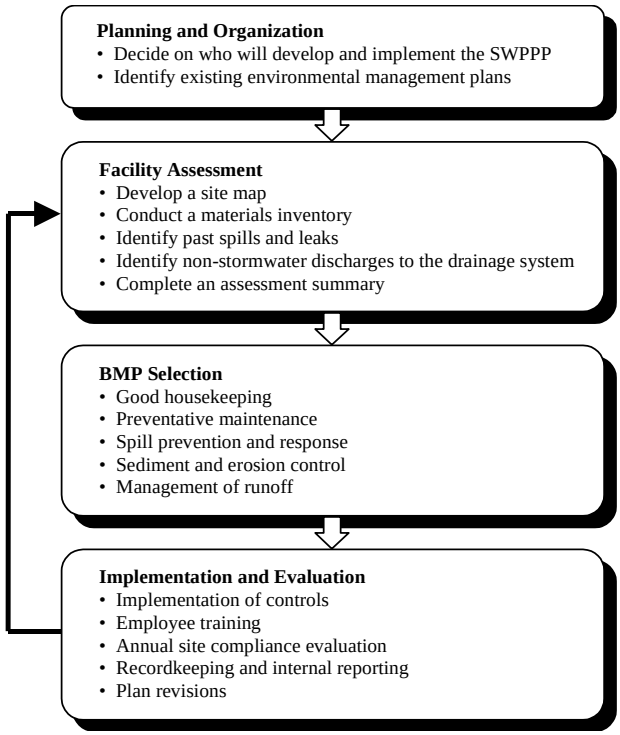
All construction sites which disturb an area of 1 acre or more, currently need a UPDES permit from the State of Utah. As a condition of the permit, a Stormwater Pollution Prevention Plan (SWPPP) must be developed and implemented. All regulated industrial facilities are required to obtain a permit, develop and implement a SWPPP.



This chapter describes one approach to prepare and implement a SWPPP. Section I describes the procedure involved for construction activities and Section II examines industrial activities. Each section contains a flowchart of the different steps involved in preparing and implementing a SWPPP. The SWPPP flowcharts for both construction and industrial activities are shown below.



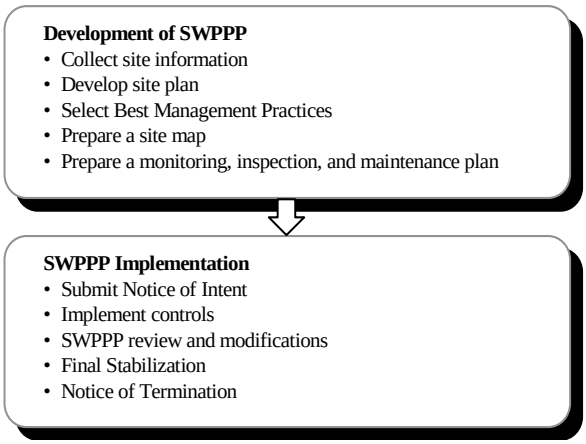
CONSTRUCTION ACTIVITIES

This section describes how to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for a construction project. The SWPPP is the focus of the UPDES stormwater permit and is the key to controlling pollutants in stormwater discharges.

The preparation of a SWPPP should not be a complicated process. Proper and careful development and implementation of the SWPPP will enhance the benefits of control measures. Responsibility for developing the SWPPP typically lies with the owner of the property that is being developed, or with the owner and operator of the construction project.

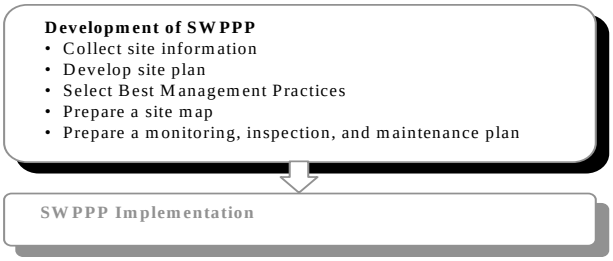
The SWPPP must be prepared before construction commences, ideally during the project planning and design phases. It is recommended that for large sites, the SWPPP be included as part of the bid package. Implementation of the SWPPP begins with the onset of construction activities, as the initial phase of construction is usually clearing and grubbing of the site, which exposes the area to uncontrolled stormwater runoff. Inspection and maintenance of best management practices occurs throughout the life of the construction project and until the site is stabilized.

A two phase process is specified in this section for SWPPP preparation and implementation: development of SWPPP and SWPPP implementation. These phases are designed to identify SWPPP procedures at both preconstruction (development) and construction (implementation) phases.



DEVELOPMENT OF SWPPP

The development stage comprises the collection of construction site information, assessment of that information to determine best management



practices and procedures, and compilation of the SWPPP.

COLLECT SITE INFORMATION

Several pieces of information should be collected before a Storm Water Pollution Prevention Plan can be prepared. This information will provide the technical basis for selection of erosion and sedimentation control BMPs and post construction BMPs. A significant amount of this data must be included in the SWPPP, as specified by the UPDES permit. It is suggested that the following items be collected.

Existing Conditions Map - Obtain a topographic site map of the proposed construction area. The map should indicate the existing land use of the site as well as the location of surface waters on or near the site boundaries.

Soils Information - Collect soil information about the site. This information can generally be obtained from the National Resources Conservation Service (NRCS). In some cases, soil sampling may need to be conducted. This information will typically identify soil constraints, design criteria, and slope stability.

Runoff Water Quality - Where possible, obtain stormwater quality data from runoff collected at or near the proposed construction site.

Name of Receiving Water - Identify the receiving water(s) which ultimately collect runoff from your site.

Rainfall Data - Determine the amount of rainfall you anticipate in your design of stormwater management measures.

Measure Site Area - The UPDES stormwater permit requires an estimate of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities. The area of the site can usually be found on the deed of sale for the property, the record plat, or site survey. The amount of area to be disturbed will generally need to be estimated based upon contractor knowledge of the construction project.

Determine the Runoff Coefficient - The runoff coefficient is the partial amount of the total rainfall which will become runoff. It provides an estimate of the development's impact on runoff after construction is complete. Consult design guides to obtain average runoff coefficient values for the specific land uses at the site.

DEVELOP SITE PLAN

The site plan will be developed based on information obtained during site collection and assessment and on objectives of the proposed construction project. Several pollution prevention principles should be considered when developing a site plan for the project. They are:

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

construction activity should be prepared and included in the SWPPP. The narrative should include: a brief description of the project, a

sequence of major soil disturbing activities involved in the project, and the approximate project duration.

SELECT BEST MANAGEMENT PRACTICES

At this stage, it should be possible to identify Best Management Practices (BMPs) to be used during the construction activities. BMPs for erosion and sediment control are employed to limit the amount and rate of erosion and to capture the transported sediment before it has the opportunity to enter a stormwater collection system or water course. The selection of BMPs is site-specific with regard to activity, topography, soil conditions, and stormwater facilities. Refer to Chapter 2 of this manual for more information on selection of BMPs for construction activities.

After selection of controls, make a list of each control that you plan to use on the site. Include in this list a description of each control, its purpose, and why it is appropriate in this location.

PREPARE POLLUTION PREVENTION SITE MAP

The owner and/or designer should prepare a site map of the proposed construction area. The map should be of sufficient scale to clearly show on-site features. Additionally, the following features should be delineated:

- Area of soil disturbance;
- Drainage patterns;
- Approximate slopes after major grading;
- Location of structural and nonstructural controls;
- Location of areas where stabilization practices are planned;
- Areas of cut and fill;
- Surface waters (including wetlands);
- Locations where stormwater is discharged to a surface water; and
- The name of the receiving water(s) and the ultimate receiving water(s).

PREPARE A MONITORING, INSPECTION, AND MAINTENANCE PLAN

The construction general permit requires that a monitoring, inspection, and maintenance plan be a component of the SWPPP. This portion of the SWPPP will identify procedures to ensure maintenance of control measures identified in the site plan remain in effective operating condition. To meet these objectives, the monitoring effort should have these elements:

- Site Inspection
- Record Keeping

Site Inspections

Personnel, with knowledge of correct installation and working BMPs, shall inspect areas exposed to soil erosion in accordance with a set inspection schedule. The Utah General Permit requires that inspections occur during construction "...at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater."

Record Keeping

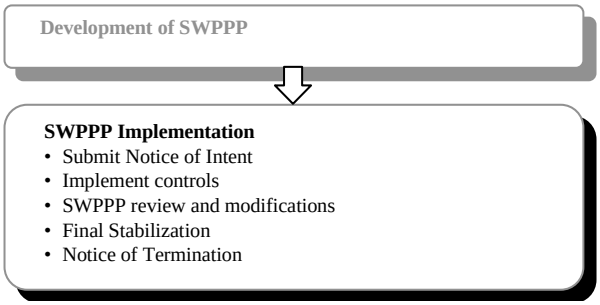
Records of all inspections, compliance certifications, and noncompliance reporting are to be retained for at least three years by the owner/developer.

These inspection reports should include the following information:

- scope of the inspection;
- name and qualifications of personnel inspecting;
- incidents of non-compliance;
- certification that the facility is in compliance with the SWPPP and the State General Permit; and
- signature of the inspector.
- major observations regarding the implementation of controls;

SWPPP IMPLEMENTATION

The implementation stage occurs during the commencement of construction and consists of



implementation BMPs, SWPPP review and modifications, and final stabilization of the site.

SUBMIT NOTICE OF INTENT

The construction general permit requires that a Notice of Intent (NOI) be submitted to the Utah Division of Water Quality (UDWQ) prior to the start of construction. The NOI is a notification that a construction project is about to begin, the location of the project, the responsible parties, and a certification that a SWPPP has been prepared and will be followed. The owner of the construction project is responsible for submitting the NOI.

IMPLEMENT CONTROLS

Construct or perform the controls which were selected for the SWPPP at the commencement of the construction project. The controls should be constructed or applied in accordance with standard specifications. If there are no specifications for a specific control measure, good engineering practices should be followed.

SWPPP REVIEW AND MODIFICATIONS

During the course of construction, unanticipated changes may occur which affect the SWPPP, such as schedule changes, phasing changes, staging area modifications, off-site drainage impacts and repeated failures of designed controls. These changes must be made known to the UDWQ and the SWPPP revised accordingly. During the preparation and review of the modified SWPPP, construction may continue with temporary modifications to the erosion and sediment control BMPs.

Revisions to the SWPPP are also required when the properly installed systems are ineffective in the prevention of silt transport off of the site. This may be due to unforseen site conditions or construction techniques which adversely affect the system as designed. Revisions to the SWPPP are also required if there is a new, deleted, or moved activity that could result in a significant amount of pollutants discharged in the stormwater.

FINAL STABILIZATION

As soon as practical after construction activities have been completed in a disturbed area, permanent stabilization (where not already implemented in the BMPs) should commence 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 is most often attained through seeding, mulching, and use of geotextiles or chemical stabilization methods.

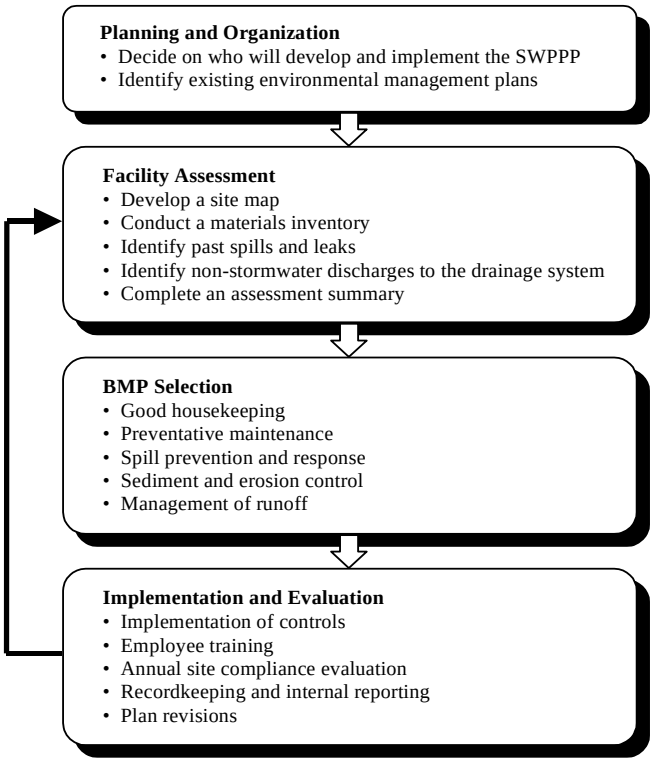
NOTICE OF TERMINATION

The Notice of Termination (NOT) is typically the final task required to comply with the requirements of an UPDES stormwater permit for a construction activity. The NOT communicates to the UDWQ that the construction activity has ceased and the area is stabilized.

INDUSTRIAL ACTIVITIES

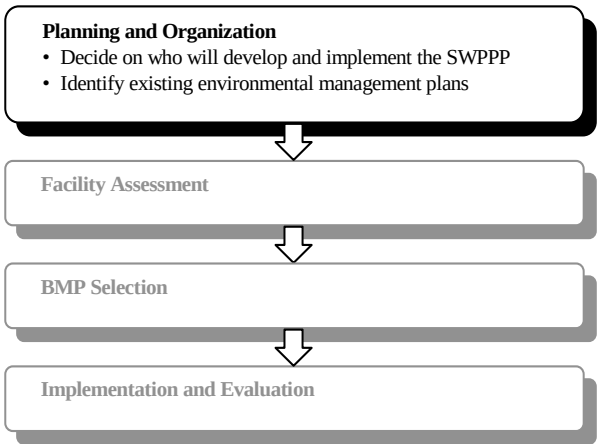
This section describes how to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for industrial sites. The discussion is intended to be general in nature so that all industrial facilities will benefit from the information. Facility owners/operators are referred to the UPDES general permit for specific requirements concerning the industrial activities at their site.

Four general phases can describe the process for SWPPP preparation and implementation, they are (1) planning and organization; (2) facility assessment; (3) BMP identification and selection; and (4) implementation and evaluation. These four planning phases are discussed, in turn, in the remainder of this section.



PLANNING AND ORGANIZATION

The planning and organization phase is designed to make developing the SWPPP easier by



organizing the staff and making preliminary decisions.

DECIDE WHO WILL DEVELOP AND IMPLEMENT THE SWPPP

The very first step is to decide who will develop and implement the pollution prevention plan. For a small facility, an individual may be sufficient. Large facilities will require pollution prevention teams under the leadership of one individual.

Where setting up a pollution prevention team is appropriate, it is important to identify the key people onsite who are most familiar with the facility and its operations, and to provide adequate structure and direction to the facility's entire stormwater management program. A clear channel of communication should be established throughout the team.

IDENTIFY EXISTING ENVIRONMENTAL MANAGEMENT PLANS

Many industrial facilities may have already incorporated stormwater management practices into day-to-day operation as a part of an environmental management plan required by other regulations. It is the responsibility of the pollution prevention team to evaluate these other plans to determine which, if any, provisions may be incorporated into the SWPPP.

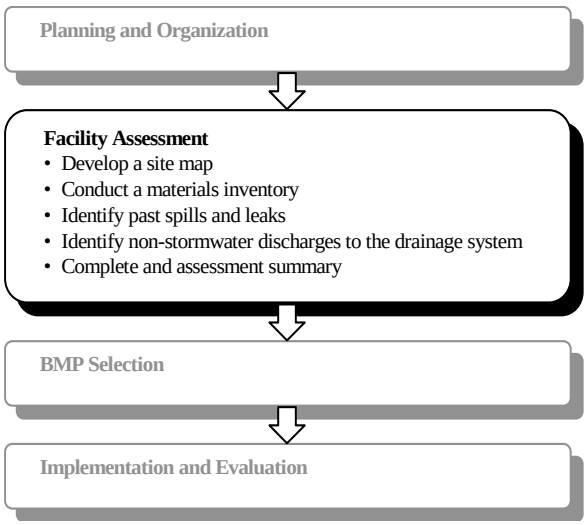
FACILITY ASSESSMENT

The facility assessment phase consists of looking at the facility/site and determining what materials or practices are or may be a source of contaminants to the stormwater running off the site. This phase is designed to help target the most important pollutant sources for corrective and/or preventive

action.

SITE MAP

A facility site map is an illustration of the overall site and location, and should indicate at minimum the information found below.



- All of the buildings at the facility;
- The areas where significant materials are stored, handled or used in process and the types of significant materials associated with each areas;
- The drainage areas associated with each stormwater discharge from the facility/site and the associated ground cover;
- All stormwater related drainage and discharge structures including all conveyance systems and appurtenances;
- Any structural stormwater controls; and
- All surface waters that receive stormwater discharges from the facility.

Locating these features on the map will help to assess the facility for potential areas of concern for stormwater contamination.

MATERIAL INVENTORY

Conduct a material inventory at the site, specifically looking for materials that have been exposed to stormwater and measures that have been taken to prevent the contact of these materials with stormwater. How materials are stored and handled has a bearing on the potential for water pollution. A knowledge of the type and location of materials will provide insight into the pollutants likely to be present.

IDENTIFY PAST SPILLS AND LEAKS

It is required to make a list of significant spills and significant leaks of toxic or hazardous materials that have occurred at the facility. This list provides information on potential sources of stormwater contamination.

IDENTIFY NON-STORMWATER DISCHARGES TO THE DRAINAGE SYSTEM

Certification is needed that the facility has been evaluated for non-stormwater discharges. Connections of non-stormwater discharges are significant sources of water quality problems. With some exceptions such discharges are illegal. Allowable discharges include:

- Discharges from fire fighting activities;
- Fire hydrant flushings;
- Potable water sources including waterline flushings;
- Irrigation drainage;
- Lawn watering;
- Uncontaminated ground water;
- Foundation or footing drains where flows are not contaminated with process materials;
- Discharges from springs;
- Routine exterior building washdown which does not use detergents or other compounds;

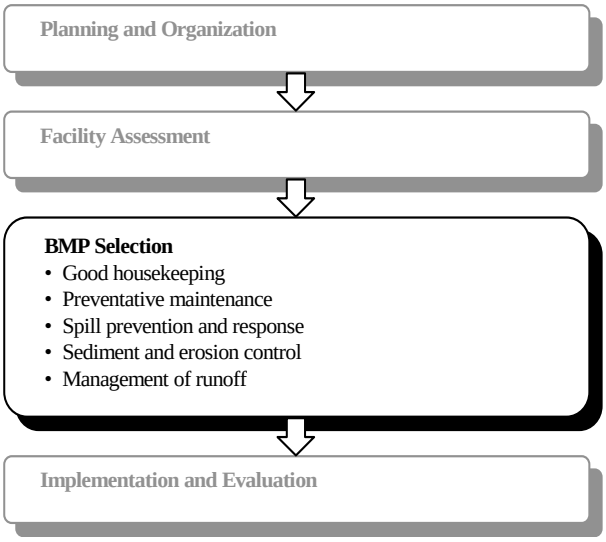
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used;
- Air conditioning condensate.

COMPLETE AN ASSESSMENT SUMMARY

Compile all of the above information for review and comment by the Pollution Prevention Team. Narratively describe any activities that may contribute to stormwater pollution and what pollutants are present in these areas.

BMP SELECTION

At this point, best management practices can be selected for the facility. BMPs are used to prevent



or mitigate pollution from activities at the facility site.

This section will briefly describe "baseline" BMPs. Baseline BMPs are practices that are inexpensive, relatively simple, and applicable to a wide variety of industries and activities. Selection of more specific industrial BMPs is contained in Chapter 5.

GOOD HOUSEKEEPING

Good Housekeeping practices are simply maintaining a safe, orderly, and clean work environment. Some methods to accomplish this include:

- Improving operation and maintenance of machinery and processes;
- Implement careful storage practices;
- Keep a current up-to-date inventory, and label all containers;
- Schedule routine cleanup operations; and
- Train employees on good housekeeping techniques.

PREVENTATIVE MAINTENANCE

A program must be developed that includes inspections and routine maintenance of all equipment, including tanks, drums, and containers, and other facility operations. Remember, the best way to stop a spill is to prevent the spill from happening in the first place.

SPILL PREVENTION AND RESPONSE

In areas that have been designated with a high possibility of a leak or spill, permittees should ensure that employees are aware of correct response procedures, including material handling and storage requirements. Spill cleanup equipment must be on-site at high risk locations. A spill plan should be formulated in case of an emergency, including notifying the appropriate authorities.

SEDIMENT AND EROSION CONTROL

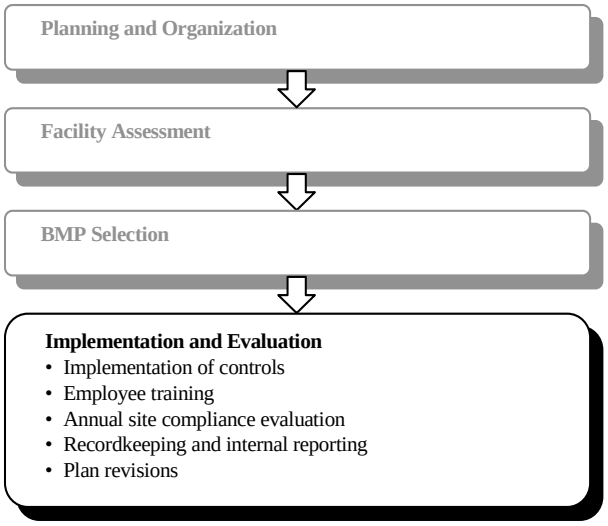
The SWPPP must identify activities that present a potential for significant soil erosion, and any measures taken to control such erosion.

MANAGEMENT OF RUNOFF

The SWPPP should also include any existing stormwater controls such as vegetative swales, infiltration trenches, or detention ponds.

IMPLEMENTATION AND EVALUATION

The last phase is development of a program to



implement the selected control measures and to evaluate their effectiveness.

IMPLEMENTATION OF CONTROLS

Implementing the plan will involve:

- Develop a schedule for implementation;
- Delegate responsibilities to specific individuals for certain aspects of the plan and monitoring implementation; and
- Ensure that management approves the schedule and strategy, and schedule specific times to report progress to management.

EMPLOYEE TRAINING

Employee training is essential to effective implementation of the SWPPP. The purpose of a training program is to teach personnel at all levels of responsibility the components and goals of the Storm Water Pollution Prevention Plan. The training program should cover such topics as spill prevention and response, good housekeeping, and material management practices.

ANNUAL SITE COMPLIANCE EVALUATION

Each year qualified personnel should conduct a site compliance evaluation to inspect all drainage areas for evidence of pollutants, evaluate good housekeeping measures, observe structural measures, and inspect all sites for problems. The plan should be revised if needed within 2 weeks of inspection, and changes should be implemented within 12 weeks. A report of all findings should be prepared, signed, and kept with the SWPPP.

RECORDKEEPING AND INTERNAL REPORTING

Records of all spills, leaks, inspections, and maintenance activities should be maintained for at least one year after the permit expires. Dates, times, weather conditions, causes, and resulting problems should all be noted.

PLAN REVISIONS

Any change in a facility design, construction, or maintenance plan will necessitate changes in the SWPPP.

REFERENCES

U.S. Environmental Protection Agency. September 1992. "Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices," EPA-832-R-92-005.

U.S. Environmental Protection Agency. September 1992. "Storm Water Management for Industrial Activities - Developing Pollution Prevention Plans and Best Management Practices," EPA-832-R-92-006.