

INDUSTRIAL STORMWATER POLLUTION PREVENTION PLANS AND STORMWATER MONITORING PROGRAMS

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Abstract. The EPA general permitting program for industrial stormwater dischargers established a requirement for Stormwater Pollution Prevention Plans. Some facilities will also be required to monitor their stormwater discharges. This paper discusses the Stormwater Pollution Prevention Plan requirements and presents an approach to monitoring, when required.

INTRODUCTION

The Stormwater Permitting Regulations adopted by the U.S. Environmental Protection Agency (EPA) in 1991 placed rather cumbersome data collection requirements on industrial facilities. Because of the difficulty in complying with the regulations for Individual and Group Permit applications, EPA adopted a somewhat more flexible approach when it promulgated its General Permit regulations in September, 1992. At the date of this writing the Georgia Environmental Protection Division (EPD) has not issued final industrial stormwater permitting regulations, but it is very likely that those regulations will closely track the EPA regulations. (EPA, 1992)

The Notice of Intent (NOI) provisions of the EPA General Permit regulations require that industrial facilities file an NOI by October 1, 1992. The General Permit itself contains special conditions that require (among other things) industrial facilities to prepare Stormwater Pollution Prevention Plans. Depending on the SIC Code or materials used at a particular industrial facility, it may be necessary to monitor stormwater discharges either annually or semi-annually. This paper discusses the Stormwater Pollution Prevention Plan (SWPPP) and presents a cost-effective approach to monitoring at industrial facilities, where applicable.

REGULATORY REQUIREMENTS

Applicability

Whether or not a particular industrial facility must comply with the stormwater permitting regulations is determined by the type of industrial activity (SIC Code), as well as the determination of areas on a given site that

are subject to stormwater runoff from industrial process or materials handling and storage areas. Areas not potentially subject to industrial activities (such as office buildings and parking lots at an industrial site where the office and parking area runoff is not combined with runoff from industrial activity areas) are not subject to the NPDES stormwater permitting requirements. Certain municipally owned facilities may be classified as industrial activities, including: landfills, land application sites and open dumps that may have accepted industrial wastes; steam electric power generation facilities; vehicle maintenance shops and airport de-icing facilities; and wastewater treatment plants with a design flow of 1.0 mgd or greater.

The primary advantage of the General Permit for applicants is that the industry is not required to complete a full permit application and submit it to EPA (or the delegated State NPDES permitting authority) for approval. Industrial facilities discharging to a municipal storm sewer serving 100,000 people or more should also send the municipality a copy of their NOI. Once the NOI is submitted, the industrial facility is permitted (two days after the postmark) to discharge stormwater. There are, however, a number of special conditions that need to be addressed to maintain compliance with the permit.

Special Conditions

Generally, non-stormwater discharges into the facility's stormwater system are prohibited unless they are permitted under a separate NPDES discharge permit. (A non-contact cooling water discharge would be a typical example.) Certain routine discharges, such as hydrant or potable water line flushing, irrigation and lawn watering, springs and uncontaminated groundwater, and 'clean' washdowns are permitted.

If a discharge of hazardous substances or oil in excess of federal 'reportable quantities' is released into the facility's stormwater system, the industry must notify both the National Response Center and the appropriate EPA Regional Office. Following the release the facility's Storm Water Pollution Prevention Plan must be modified to record the release and reviewed to prevent or minimize the opportunity of such releases in the future. If a facility anticipates more than one release of the same hazardous

substance per year, it must follow the same notification procedures.

STORMWATER POLLUTION PREVENTION PLANS

A major condition of the General Permit is the preparation of a Storm Water Pollution Prevention Plan (SWPPP). The purpose of the SWPPP is to identify potential sources of stormwater pollution and to describe and implement measures to minimize the release of pollutants at industrial facilities. For most industries the SWPPP must be prepared by April 1, 1993, and any recommended pollution prevention measures implemented by October 1, 1993. The SWPPP need not be submitted to EPA, but it must be kept at the facility and made available to the regulatory agency on request. EPA may review the facility's SWPPP and require changes to meet the minimum requirements of the stormwater permitting regulations. Plans must be kept current and modified whenever there is a change at the facility that could affect stormwater or if the pollution prevention measures are not effective.

The SWPPP for each facility must include a number of items, as follows:

1) Pollution Prevention Team - The staff responsible for developing and maintaining the SWPPP at the facility, and their respective responsibilities in that regard;

2) Description of Potential Pollution Sources - Must identify activities and significant materials that could be sources of pollution, as follows:

a) **Drainage** - to include a Site Drainage Map and probable types and routes of material that could be released to stormwater;

b) **Inventory of Exposed Materials** - A description of materials potentially exposed to precipitation and their history for the past three years, as well as measures to prevent or minimize their contact with stormwater;

c) **Spill Prevention and Response Procedures** - A history of significant spills or leaks of toxic or hazardous substances after the effective date of the permit, to be updated as needed;

d) **Sampling Data** - A summary of discharge sampling data for the facility, including sampling done during the term of the permit;

e) **Risk Identification and Summary of Potential Pollutant Sources** - A narrative description of potential pollution sources and identifying parameters of concern for each potential source.

3) Measures and Controls - The elements of implementing the SWPPP, complete with a schedule, must include the following minimum components:

- Good housekeeping;
- Preventive maintenance;
- Spill prevention and response procedures;
- Inspections;

- Employee training;
- Record keeping and internal reporting procedures;
- Certification of no non-stormwater discharges ;
- Erosion and sediment control; and
- Management of runoff.

4) Comprehensive Site Compliance Evaluation - Qualified personnel at the facility must conduct at least annual inspections of areas exposed to stormwater on the site. The description of pollutant sources and the measures and controls sections of the SWPPP must be modified as appropriate, based on the inspection. The findings of the Site Compliance Evaluation must be written into a report verifying compliance or documenting incidents of noncompliance, and retained on file for at least one year.

5) Additional Requirements. Facilities Discharging into Municipal Stormwater Systems over 100,000 population. - Facilities discharging stormwater into medium or large municipal stormwater systems must comply with the NPDES stormwater permit issued for that municipality. Also, industrial facilities must make their SWPPP available to the municipality.

6) Consistency with other plans - The SWPPP should be consistent with Spill Prevention and Control Countermeasure Plans and/or BMP plans.

7) EPCRA Section 313 Facilities - Industrial facilities subject to the reporting requirements of EPCRA Section 313 (SARA Title III) must address a number of additional requirements in their SWPPP's. These include containment, drainage control and diversionary structures to minimize the potential for Section 313 materials to come into contact with stormwater. Also, the facility must demonstrate compliance with guidelines for storage and handling of Section 313 materials. Discharges from areas subject to Section 313 must be contained. Any discharges from these areas must be recorded. Proper Maintenance and Housekeeping in these areas must also be documented. Such facilities must be secured and the staff trained in SWPPP practices at least annually. Finally, a registered Professional Engineer must certify that the SWPPP has been prepared in accordance with good engineering practices, and must re-certify the SWPPP at least every three years.

Monitoring Requirements

Many industrial facilities are not required to do monitoring of their stormwater discharges. However, certain types of industrial facilities are required to perform semiannual discharge monitoring, and others are required to do annual monitoring. These are summarized below.

a) Semiannual Monitoring:

- EPCRA Section 313 Facilities
- Primary Metals Industries
- Land Disposal Units, Incinerators, Boilers and Industrial Furnaces
- Wood Treatment Facilities
- Coal Pile Runoff (subject to direct numerical efflu-

- ent limitations)
 - Battery Reclaimers
- b) **Annual Monitoring:**
 - Airports (Over 50,000 Flights per year)
 - Coal-Fired Steam Electric Facilities
 - Animal Handling/Meat Packing Facilities
 - Solid Chemical Storage Facilities
 - Automobile Junkyards
 - Lime Storage Piles exposed to stormwater at lime manufacturing facilities
 - Oil handling sites at oil-fired generating facilities
 - Cement manufacturing facilities and kilns
 - Ready-mixed concrete facilities
 - Shipbuilding and repair facilities

Sample parameters are specified for each of the facility types required to do monitoring. Most of the facilities required to do semiannual monitoring must also do whole effluent toxicity testing in addition to conventional sampling. Except for facilities where there are holding ponds that capture at least 24 hours' runoff, monitoring must include both grab and flow-weighted composite sampling. Facilities that are able to demonstrate that they have outfalls with substantially identical effluent characteristics only need to sample a representative outfall. Also, if a facility is able to certify that, for a particular drainage area, no significant materials currently come in contact with stormwater, and that none will come in contact with stormwater during the reporting period, they need not sample the outfalls from those areas. Facilities required to monitor must take the samples during specified periods and must submit Discharge Monitoring Reports to appropriate Regional EPA Offices.

DESIGNING A STORMWATER DISCHARGE MONITORING PROGRAM

Preparing an industrial stormwater monitoring program involves the determination of areas on a given site that are subject to stormwater runoff from industrial process areas, then establishing a program of sampling. Areas not potentially subject to EPA-defined 'industrial activities', such as office buildings and parking lots that may be at an industrial site but do not share drainage with industrial areas, are not subject to the NPDES stormwater permitting requirements.

Monitoring Variables

Depending on the facility, there may be few or many stormwater outfalls to be sampled. Depending on the facility type, there may be widely differing sampling requirements as well. Outfalls may discharge through a number of different types of conveyances (pipes, paved or unpaved channels, swales, etc.) to various receiving bodies such as natural water bodies, retention ponds, or municipal storm sewers.

The SWPPP must include a site drainage map. The map must show: areas that drain to each outfall; structural pollution control measures; surface water bodies; locations of significant materials exposed to stormwater; locations of spills and leaks; and locations of certain activities that could expose significant materials to stormwater.

The permittee must determine what pollutants must be sampled and must establish a sampling program for those constituents. Facilities in various categories have time-of-year requirements as well. Grab and composite samples are required at most facilities and must be taken during a 'representative' storm. There must be a period of at least 72 hours of no precipitation before the storm during which sampling is done, and the rainfall must be at least 0.1 inches. Grab samples must be taken within 30 minutes of the onset of rain, and composite samples should be taken at 20-minute intervals for three hours, or the duration of the storm, whichever is less.

A potential problem is how the sampling will be performed at the facility, particularly if there is no staff capability at the plant for doing the sampling. In most cases it is impractical for an outside contractor to begin sampling within the required 30 minutes after rainfall in a "representative" storm. The alternative would be installation of automated sampling equipment, which is very expensive, particularly for a once-or-twice per year sampling requirement, and this equipment is subject to failure from a number of sources.

Facility Staff Training and Sampling

An approach successfully used to assist industrial clients in the stormwater discharge monitoring process is presented as follows. After making a thorough site inspection, a sampling plan for each facility is developed. The sampling plan is designed specifically to collect required data for each outfall, while eliminating unnecessary sampling from outfalls with similar discharge characteristics.

Consulting staff members meet with the facility staff to train them in sampling techniques, according to their level of experience. Because there may be different types of stormwater conveyances at the facility, we have found it effective to develop a depth-discharge flow measuring capability for each outfall. Easy-to-use forms are custom-developed for each facility to enable staff at the facility to use the proper bottles for sample collection and to perform the flow-weighted composite sample as required by EPA. These forms and instructions are sent to an independent laboratory and included in the stormwater kit with the usual chain-of-custody documents.

Working closely with the laboratory, a sampling kit is prepared for each outfall to be sampled. The kits are complete with instructions on how and when sampling is to be done, and include step-by-step instructions for taking both grab and flow-weighted composite samples for required parameters. The kits are shipped to the industrial facility and sampling is performed by the plant staff

when a representative storm occurs. For General Permit facilities, the sampling must be done during the months specified by EPA regulations. Completed samples are returned to the contract laboratory, where necessary analyses are performed.

Laboratory data are forwarded to the engineer after the analytical work is completed, to be incorporated into the Discharge Monitoring Report (DMR). Finally, the DMR is completed and forwarded to the client for submission to U.S. EPA or the delegated State NPDES permitting authority.

CONCLUSIONS

The preceding discussion presented a simplified look at the EPA Industrial Stormwater General Permit Regulations. It can readily be seen that determining which part of the regulations apply and finding the most expeditious method of complying with those regulations is no simple task for many industrial facility managers. For most facilities, the Stormwater Pollution Prevention Plan, which is prepared and retained on-site, is the major requirement of the General Permit. However, some facilities will also need to establish a program of stormwater discharge monitoring and reporting.

Facility managers should give early attention to their stormwater permit, because deadlines for both Stormwater Pollution Prevention Plan preparation and compliance are short. Also, the ramifications of compliance may affect facilities for a long period into the future. There is a risk of substantial penalties for permit violations under the Clean Water Act, particularly in the area of third-party liability. Therefore, industrial facility managers should give high priority to the planning, preparation and compliance measures required by the General Stormwater Permit Regulations.

LITERATURE CITED

- U. S. Environmental Protection Agency, September 1992, NPDES General Permit for Storm Water Discharges Associated with Industrial Activity.
- U. S. Environmental Protection Agency, September 1992, Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices.
- U. S. Environmental Protection Agency, February 1993, NPDES Storm Water Sampling Guidance Document.