ENVIRONMENTAL PROTECITON AGENCY

[FRL–5298–3]

Final National Pollutant Discharge Elimination System Storm Water Multi-Sector General Permit for Industrial Activities

AGENCY: Environmental Protection Agency.

SUMMARY: The following provides notice for a final NPDES general permit, accompanying response to comments, and fact sheets for storm water discharges associated with industrial activity in the following Regions:

Region I—the States of Maine, Massachusetts, and New Hampshire; Federal Indian Reservations located in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; and Federal facilities located in Vermont.

Region II—the Commonwealth of Puerto Rico and Federal facilities located in Puerto Rico.

Region III—the District of Columbia and Federal facilities located in Delaware and the District of Columbia.

Region IV—the State of Florida.

Region V—no areas.

Region VI—the States of Louisiana, New Mexico, Oklahoma, and Texas, and Federal Indian Reservations located in Louisiana, New Mexico (except Navajo Reservation lands, which are handled by Region IX, and Ute Mountain Reservation lands, which are handled by Region VIII and are not being covered by this permit), Oklahoma, and Texas.

Region VII—no areas.

Region VIII—no areas.

Region IX—the State of Arizona; the Territories of Johnston Atoll, and Midway and Wake Islands; all Federal Indian Reservations located in Arizona, California, and Nevada; those portions of the Duck Valley, Fort McDermitt, and Goshute Reservations located outside Nevada; those portions of the Navajo Reservation located outside Arizona; and Federal facilities located in Arizona, Johnston Atoll, and Midway and Wake Islands.

Region X—the State of Idaho; Federal Indian Reservations located in Alaska, Idaho (except Duck Valley Reservation lands, which are handled by Region IX), Oregon (except Fort McDermitt Reservation lands, which are handled by Region IX), and Washington; and Federal facilities located in Idaho, and Washington.

The permit covers storm water discharges associated with industrial activity to waters of the United States, including discharges through large and medium municipal separate storm sewer systems, and through other municipal separate storm sewer systems. The permit is intended to cover discharges from the following types of industrial activities: lumber and wood products facilities; paper and allied products manufacturing facilities; chemical and allied products manufacturing facilities; asphalt paving and roofing materials manufacturers and lubricants; stone, clay, glass and concrete products facilities; primary metals facilities; metal mines (ore mining and dressing); coal mines; oil and gas extraction facilities; nonmetallic mines and quarries; hazardous waste treatment, storage or disposal facilities; landfills, land application sites and open dumps; automobile salvage yards; scrap and waste material processing and recycling facilities; steam electric power generating facilities; railroad transportation facilities, local and suburban transit and interurban highway passenger transportation facilities, petroleum bulk oil stations and terminals, motor freight transportation facilities and U.S. Postal Service facilities; water transportation facilities; ship or boat building/repair facilities; airports; wastewater treatment plants; food and kindred products facilities; textile mills, apparel and other fabric manufacturing facilities; furniture and fixture manufacturing facilities; printing and publishing facilities; rubber and miscellaneous plastic product and miscellaneous manufacturing facilities; leather tanning and finishing facilities; facilities that manufacture fabricated metal products, jewelry, silverware, and plated ware; facilities that manufacture transportation equipment, industrial, or commercial machinery; and facilities that manufacture electronic equipment and components, photographic and optical goods. Military installations must comply with the permit and monitoring requirements for all sectors that describe industrial activities that such installations perform. Publication of this final general permit, fact sheets, and response to comments complies with the requirements of 40 Code of Federal Regulations (CFR) 124.10.

The language of the permit is provided as an appendix to the preamble of this notice. Most conditions of the general permit are intended to apply to all permittees, unless stated otherwise. Where conditions vary by State, these differences are indicated in the appendix.

ADDRESSES: Notices of Intent (NOIs) to be covered under this permit and Notices of Termination (NOT) to terminate coverage under this permit must be sent to Storm Water Notice of Intent (4203), 401 M Street, SW., Washington, DC 20460. The complete administrative record is available through the Water Docket MC–4101, Environmental Protection Agency, 401 M Street SW, Washington DC 20460. A reasonable fee may be charged for copying. Each Regional office (see addresses listed in Part VI.G. of this fact sheet) has an index of the complete administrative record.

DATES: This general permit shall be effective on September 29, 1995. Deadlines for submittal of Notices of Intent (NOIs) are provided in Section II.A. of the general permit. Today's general permit also provides additional dates for compliance with the terms of the permits and for submitting monitoring data where required.

FOR FURTHER INFORMATION: For further information on the NPDES storm water general permit, contact the appropriate EPA Regional Office. The name, address and phone number of the EPA Regional Storm Water Coordinators are provided in Part VI.G. of the fact sheet.

Organization of Today's Permit

Today's permit covers storm water discharges from a wide variety of industrial activities. Because the conditions which affect the presence of pollutants in storm water discharges vary among industries, today's permit contains industry-specific sections that describe the storm water pollution prevention plan requirements, the numeric effluent limitation requirements and the monitoring requirements for that industry. These industry-specific sections are contained in Part XI of today's permit and are described in Part VIII of this fact sheet. There are also a number of permit requirements that apply to all industries. These requirements may be found in Parts I through X. They include the general coverage discussion, the Notice of Intent requirements and standard permit conditions. Specifically, Parts I through VII of this fact sheet describe these common requirements. The following is an outline of this fact sheet.

I. Background

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act (CWA)) was amended to provide that the discharge of any pollutant to waters of the United States from any point source is unlawful, except if the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.

For a number of reasons, EPA and authorized NPDES States have failed to issue NPDES permits for the majority of point source discharges of storm water. Recognizing this, Congress added section 402(p) to the CWA in 1987 to establish a comprehensive framework for addressing storm water discharges under the NPDES program. Section 402(p)(4) of the CWA clarifies the requirements for EPA to issue NPDES permits for storm water discharges associated with industrial activity. On November 16, 1990 (55 FR 47990 as amended at 56 FR 12100, Mar. 21, 1991; 56 FR 56554, Nov. 5, 1991; 57 FR 11412, Apr. 2, 1992; 57 FR 60447, Dec. 18, 1992), EPA published final regulations which defined the term "storm water discharge associated with industrial activity." These regulations also set forth NPDES permit application requirements for storm water discharges associated with industrial activity and storm water discharges from certain municipal separate storm sewer systems. The regulations presented three permit application options for storm water discharges associated with industrial activity. The first option was to submit an individual application consisting of Forms 1 and 2F. The second option was to become a participant in a group application. The third option was coverage under a general permit in accordance with the requirements of an issued general permit.

The promulgation of today's general permit is in response to the second of these three options. Group applications were submitted in two parts. Part 1 of the application was due by September 30, 1991, and part 2 of the application was due by October 1, 1992. In part 1 of the application, all participants were identified and information on each facility was included, such as industrial activities, significant materials exposed to storm water, and material management activities. For part 1 of the application, groups also identified sampling subgroups to submit sampling data for part 2. Over 1,200 groups with over 60,000 member facilities submitted part 1 applications. Upon review of the part 1 application, if the EPA determined that the application was an appropriate grouping of facilities with complete information provided on each participant, and a suitable sampling subgroup was proposed, the application was approved.

Part 2 of the application consisted of sampling data from each member of the sampling subgroup identified in part 1 of the application. In drafting today's general permit, EPA reviewed both parts of the applications and formulated the permit language noticed today. NPDES authorized States were provided the data from the group applications. Authorized NPDES States may propose and finalize either individual permits for each facility included in the application located in the State, or general permits, if the State has general permit authority.[1] If the State feels additional information is needed from the applicants, the State may ask each or any of the applicants for more information on their facility and/or discharge.

EPA estimates that about 100,000 facilities nationwide discharge storm water associated with industrial activity (not including oil and gas exploration and production operations) as described under phase I of the storm water program. The large number of facilities addressed by the regulatory definition of "storm water discharge associated with industrial activity" has placed a tremendous administrative burden on EPA and States with authorized NPDES programs to issue and administer permits for these discharges.

To provide a reasonable and rational approach to addressing this permitting task, the Agency has developed a strategy for issuing permits for storm water discharges associated with industrial activity. In developing this strategy, the Agency recognized that the CWA provides flexibility in the manner in which NPDES permits are issued,[2] and has used this flexibility to design a workable permitting system. In accordance with these considerations, the permitting strategy (described in more detail in 57 FR 11394) describes a four-tier set of priorities for issuing permits for these discharges:

Tier I—Baseline Permitting—One or more general permits will be developed to initially cover the majority of storm water discharges associated with industrial activity.

Tier II—Watershed Permitting—Facilities within watersheds shown to be adversely impacted by storm water discharges associated with industrial activity will be targeted for individual or watershed-specific general permits.

Tier III—Industry-Specific Permitting—Specific industry categories will be targeted for individual or industry-specific general permits.

Tier IV—Facility-Specific Permitting—A variety of factors will be used to target specific facilities for individual permits.

The general permit accompanying this fact sheet will continue Phase 1 permitting activities for storm water discharges associated with industrial activity by providing industry-specific coverage to group applicants in the following areas: the States of Arizona, Florida, Idaho, Louisiana, Maine, Massachusetts, New Hampshire, New Mexico, Oklahoma, and Texas; the District of Columbia; Johnston Atoll, and Midway and Wake Islands; the Commonwealth of Puerto Rico; Federal Indian Reservations in Alaska, Arizona, California, Connecticut, Idaho, Louisiana, Maine, Massachusetts, Nevada, New Hampshire, New Mexico, Oklahoma, Oregon, Rhode Island, Texas, Utah (only the Navajo and Goshute Reservations), Vermont, and Washington; and Federal facilities located in Arizona, the Commonwealth of Puerto Rico, the District of Columbia, Delaware, Idaho, Johnston Atoll, Midway and Wake Islands, Vermont, and Washington.[3] EPA will provide today's permit to the NPDES authorized States and encourages such States to consider this permit for their permitting needs.

II. Types of Discharges Covered

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory

[1] As of December 1993, 39 of the 40 NPDES authorized State permitting programs had the authority to issue general permits.

[2] The court in *NRDC* v. *Train*, 396 F.Supp. 1393 (D.D.C. 1975) *aff'd*, *NRDC* v. *Costle*, 568 F.2d 1369 (D.C.Cir. 1977), has acknowledged the administrative burden placed on the Agency by requiring permits for a large number of storm water discharges. The courts have recognized EPA's discretion to use certain administrative devices, such as area permits or general permits, to help manage its workload. In addition, the courts have recognized flexibility in the type of permit conditions that can be established, including the use of requirements for best management practices.

[3] In 5 of the 40 States that are authorized to issue NPDES permits for municipal and industrial sources, EPA issues permits for discharges from Federal facilities. EPA also retains authority to issue permits on Federal Indian Reservations. However, this fact sheet only addresses general permits as indicated above. Where EPA is the permit issuing authority for other storm water discharges, either individual permits or a different general permit will be issued.

definition of "storm water discharge associated with industrial activity" which addresses point source discharges of storm water from eleven major categories of industrial activities. Industrial activities from all of these categories with the exception of construction activities participated in the group application process. The information contained in the group applications indicates that type and amount of pollutants discharged in storm water varies from industrial activity to industrial activity because of the variety of potential pollutant sources present in different industrial activities, as well as the variety of pollution prevention measures commonly practiced by each of the regulated industries. To facilitate the process of developing permit conditions for each of the 1200 group applications submitted, EPA classified groups into 29 industrial sectors where the nature of industrial activity, type of materials handled and material management practices employed were sufficiently similar for the purposes of developing permit conditions. Each of the industrial sectors were represented by one or more groups which participated in the group application process. Table 1 lists each of the industrial activities covered by today's permit, and the corresponding sections of today's fact sheet and permit which discuss the specific requirements for that industry. EPA has further divided some of the 29 sectors into subsectors in order to establish more specific and appropriate permit conditions, including best management practices and monitoring requirements.

Coverage under today's general permit is available to storm water discharges from industrial activities represented by the group application process. However, coverage under this permit is not restricted to participants in the group application process. To limit coverage under this general permit only to those who participated in the Group application process would not be appropriate for administrative, environmental, and national consistency reasons. The administrative burden for EPA to develop separate general permits for non-group members would be excessive, unnecessary, and wasteful of tax dollars. EPA would also need to use the same information in the development of such permits. The permits would be essentially the same. The time spent in this process would leave many facilities unregulated for some number of additional months. This would not address the environmental concerns of the Clean Water Act. Likewise, group members are not precluded from seeking coverage under other available storm water permits such as EPA's "baseline" general permits for Storm Water Discharges Associated with Industrial Activity, (57 FR 41175 and 57 FR 44412). Group members must consider, however, that the deadlines for preparing and implementing the pollution prevention plan required under the baseline permit have already expired for existing facilities. Therefore, group members that seek coverage under the baseline general permit must have a pollution prevention plan developed and implemented prior to NOI submittal.

Unlike the baseline general permits, today's permit does not exclude all storm water discharges subject to effluent limitation guidelines. Four types of storm water discharges subject to effluent limitation guidelines may be covered under today's permit if they are not already subject to an existing or expired NPDES permit. These discharges include contaminated storm water runoff from phosphate fertilizer manufacturing facilities, runoff associated with asphalt paving or roofing emulsion production, runoff from material storage piles at cement manufacturing facilities and coal pile runoff at steam electric generating facilities. The permit does not, however, authorize all storm water discharges subject to effluent guidelines. Storm water discharges subject to effluent guidelines under 40 CFR part 436 or for mine drainage under 40 CFR part 440 are not covered under today's permit nor are discharges subject to effluent guidelines for acid or alkaline mine drainage under 40 CFR part 434.

TABLE 1.—INDUSTRIAL ACTIVITIES COVERED BY TODAY'S GENERAL PERMIT

Industrial activity	Fact sheet section describing discharges covered	Permit section describing discharges covered
Timber Products Facilities	VIII.A	XI.A.
Paper and Allied Products Manufacturing Facilities	VIII.B	XI.B.
Chemical and Allied Products Manufacturing Facilities	VIII.C	XI.C.
Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers	VIII.D	XI.D.
Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities	VIII.E	XI.E.
Primary Metals Facilities	VIII.F	XI.F.
Metal Mining (Ore Mining and Dressing) Facilities	VIII.G	XI.G.
Coal Mines and Coal Mining-Related Facilities	VIII.H	XI.H.
Oil and Gas Extraction Facilities	VIII.I	XI.I.
Mineral Mining and Processing Facilities	VIII.J	XI.J.
Hazardous Waste Treatment, Storage, or Disposal Facilities	VIII.K	XI.K.
Landfills and Land Application Sites	VIII.L	XI.L.
Automobile Salvage Yards	VIII.M	XI.M.
Scrap and Waste Recycling Facilities	VIII.N	XI.N.
Steam Electric Power Generating Facilities, Including Coal Handling Areas	VIII.O	XI.O.
Vehicle Maintenance or Equipment Cleaning Areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and the United States Postal Service.	VIII.P	XI.P.
Vehicle Maintenance Areas and/or Equipment Cleaning Operations at Water Transportation Facilities.	VIII.Q	XI.Q.
Ship and Boat Building or Repairing Yards	VIII.R	XI.R.
Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Area located at Air Transportation Facilities.	VIII.S	XI.S.
Treatment Works	VIII.T	XI.T.
Food and Kindred Products Facilities	VIII.U	XI.U.
Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities	VIII.V	XI.V.
Wood and Metal Furniture and Fixture Manufacturing Facilities	VIII.W	XI.W.

TABLE 1.—INDUSTRIAL ACTIVITIES COVERED BY TODAY'S GENERAL PERMIT—Continued

Industrial activity	Fact sheet section describing discharges covered	Permit section describing discharges covered
Printing and Publishing Facilities	VIII.X	XI.X.
Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries	VIII.Y	XI.Y.
Leather Tanning and Finishing Facilities	VIII.Z	XI.Z.
Fabricated Metal Products Industry	VIII.AA	XI.AA.
Facilities That Manufacture Transportation Equipment, Industrial, or Commercial Machinery.	VIII.AB	XI.AB.
Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods.	VIII.AC	XI.AC.

A. Limitations on Coverage

Because of the broad scope of today's permit, most industrial activities currently regulated under the storm water program could be covered by the permit. There are, however, several types of storm water discharges which are not covered under today's permit. Storm water discharges subject to an existing NPDES permit are not covered under today's permit, except facilities which are currently subject to the baseline general permit. EPA believes that in most cases these discharges are more appropriately covered under terms and conditions of their existing permit. These discharges may be covered under today's permit only when the existing permit has expired and only when the expired permit did not contain numeric effluent limitations more stringent than those in today's permit. Owners/operators of facilities currently covered under the baseline general permit who wish to obtain coverage under today's general permit must submit a Notice of Termination (NOT) to terminate coverage under the baseline general permit with a Notice of Intent (NOI) to be covered under today's permit. Storm water discharges that were subject to an NPDES permit that was terminated by the permitting authority are not eligible for coverage under today's permit. Construction activities are not eligible for coverage under this permit. Storm water discharges that were subject to a permit that was terminated as a result of the permittee's request are eligible for coverage under today's permit. Storm water discharges from industrial activities that are not addressed in the appropriate section of Part XI. (see Table 1) of the permit are not eligible for coverage under this permit. These types of industrial activities were not represented in the group application process. Therefore, EPA has no additional information with which to develop permit requirements beyond those developed for the baseline general permit.

(1) Storm Water Discharges Subject to New Source Performance Standards. Section 306 of the Clean Water Act requires EPA to develop performance standards for all new sources described in that section. These standards apply to all facilities which go into operation after the date the standards are promulgated. Section 511(c) of the Clean Water Act requires the Agency to comply with the National Environmental Policy Act prior to issuance of a permit under the authority of Section 402 of the CWA to facilities defined as a new source under Section 306.

Facilities which are subject to the performance standards for new sources as described in this section of the fact sheet must provide EPA with an Environmental Information Document pursuant to 40 CFR 6.101 prior to seeking coverage under this permit. This information shall be used by the Agency to evaluate the facility under the requirements of the National Environmental Policy Act (NEPA) in an Environmental Review. The Agency will make a final decision regarding the direct or indirect impact of the discharge. The Agency will follow all administrative procedures required in this process. The permittee must obtain a copy of the Agency's final finding prior to the submittal of a Notice of Intent to be covered by this general permit. In order to maintain eligibility, the permittee must implement any mitigation required of the facility as a result of the NEPA review process. Failure to implement mitigation measures upon which the Agency's NEPA finding is based is grounds for termination of permit coverage. In this way, EPA has established a procedure which allows for the appropriate review procedures to be completed by this Agency prior to the issuance of a permit under Section 402 of the CWA to an operator of a facility subject to the new source performance standards of Section 306 of the CWA. EPA believes that it has fulfilled its requirements under NEPA for this federal action under Section 402 of the CWA.

(2) Historic Preservation. The National Historic Preservation Act (NHPA) prohibits Federal actions that would affect a property that either is listed on, or is eligible for listing, on the National Historic Register. EPA therefore cannot issue NPDES permits to discharges that will affect historic properties unless measures will be taken such as under a written agreement between the applicant and the State Historic Preservation Officer (SHPO) that outlines all measures to be undertaken by the applicant to mitigate or prevent adverse effects to the historic property. Therefore, under today's permit a storm water discharge may be covered only if the discharge will not affect a historic property that is listed or is eligible to be listed in the National Historic Register, or the operator has obtained and is in compliance with a written agreement signed by the State Historic Preservation Officer (SHPO) that outlines measures to be taken to mitigate or prevent adverse affects to the historic site.

(3) Endangered Species. The Endangered Species Act (ESA) of 1973 requires Federal Agencies such as EPA to ensure, in consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services) that any actions authorized, funded, or carried out by the Agency (e.g., EPA issued NPDES permits authorizing discharges to waters of the United States) are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species (see 16 U.S.C. 1536(a)(2), 50 CFR 402 and 40 CFR 122.49(c)). EPA completed a formal consultation with the Services on the action of issuing this permit on April 5, 1995. The terms and conditions of this permit reflect the results of that consultation.

Accordingly, storm water discharges that are likely to adversely affect species identified in Addendum H of the permit are not authorized permit coverage

under this storm water multi-sector industrial general permit. Permittees are also not authorized permit coverage if the BMPs they plan to construct and operate as a part of the required storm water pollution prevention plan are likely to adversely affect a species identified in Addendum H.

To be eligible for coverage under the multi-sector storm water permit, applicants are required to review the list of species and their locations which are contained in Addendum H of this permit and which are described in the instructions for completing the application requirements under this permit. If an applicant determines that none of the species identified in the addendum are found in the county in which the facility is located, then there is no likelihood of an adverse affect and they are eligible for permit coverage. Applicants must then certify that their discharges, and the construction of storm water BMPs, are not likely to adversely affect species and will be granted multi-sector storm water permit coverage 48 hours after the date of the postmark on the envelope used to mail in the NOI form.

If species identified in Addendum H are found to be located in the same county as the facility seeking storm water permit coverage, then the applicant next must determine whether the species are in proximity to the storm water discharges at the facility, or any BMPs to be constructed to control storm water runoff. A species is in proximity to a storm water discharge when the species is located in the path or down gradient area through which or over which point source storm water flows from industrial activities to the point of discharge into the receiving water, and once discharged into the receiving water, in the immediate vicinity of, or nearby, the discharge point. A species is also in proximity if a species is located in the area of a site where storm water BMPs are planned to be constructed. If an applicant determines there are no species in proximity to the storm water discharge, or the BMPs to be constructed, then there is no likelihood of adversely affecting the species and the applicant is eligible for permit coverage.

If species are in proximity to the storm water discharges or areas of BMP construction, as long as they have been considered as part of a previous ESA authorization of the applicant's activity, and the environmental baseline established in that authorization is unchanged, the applicant may be covered under the permit. For example, an applicant's activity may have been authorized as part of a section 7 consultation under ESA, covered under a section 10 permit, or have received a clearance letter. The environmental baseline generally includes the past and present impacts of all federal, state and private actions that were contemporaneous to an ESA authorization. Therefore, if a permit applicant has received previous authorization and nothing has changed or been added to the environmental baseline established in the previous authorization, then coverage under this permit will be provided.

In the absence of such previous authorization, if species identified in Addendum H are in proximity to the discharges, or the construction areas for the BMPs, then the applicant must determine whether there is any likely adverse effect upon the species. This is done by the applicant conducting a further examination or investigation, or an alternative procedure, described in the instructions in Addendum H of the permit. If the applicant determines there is no likely adverse effect upon the species, then the applicant is eligible for permit coverage. If the applicant determines that there likely is, or will likely be an adverse effect, then the applicant is not eligible for multi-sector storm water permit coverage.

All dischargers applying for coverage under this permit must provide in the application information on the Notice of Intent form: (1) a determination as to whether there are any species identified in Addendum H in proximity to the storm water discharges and BMPs construction areas, and (2) a certification that their storm water discharges and the construction of BMPs to control storm water are not likely to adversely affect species identified in Addendum H, or are otherwise eligible for coverage due to a previous authorization under the ESA. Coverage is contingent upon the applicant's providing truthful information concerning certification and abiding by any conditions imposed by the permit.

Dischargers who are not able to determine that there will be no likely adverse affect to species or habitats and cannot sign the certification to gain coverage under this multi-sector storm water general permit, must apply to EPA for an individual NPDES storm water permit. As appropriate, EPA will conduct ESA § 7 consultation when issuing such individual permits.

Regardless of the above conditions, EPA may require that a permittee apply for an individual NPDES permit on the basis of possible adverse effects on species or critical habitats. Where there are concerns that coverage for a particular discharger is not sufficiently protective of listed species, the Services (as well as any other interested parties) may petition EPA to require that the discharger obtain an individual NPDES permit and conduct an individual section 7 consultation as appropriate.

In addition, the Assistant Administrator for Fisheries for the National Oceanic and Atmospheric Administration, or his/her authorized representative, or the U.S. Fisheries and Wildlife Service (as well as any other interested parties) may petition EPA to require that a permittee obtain an individual NPDES permit. The permittee is also required to make the storm water pollution prevention plan, annual site compliance inspection report, or other information available upon request to the Assistant Administrator for Fisheries for the National Oceanic and Atmospheric Administration, or his/her authorized representative, or the U.S. Fisheries and Wildlife Service Regional Director, or his/her authorized representative.

These mechanisms allow for the broadest and most efficient coverage for the permittee while still providing for the most efficient protection of endangered species. It significantly reduces the number of dischargers that must be considered individually and therefore allows the Agency and the Services to focus their resources on those discharges that are indeed likely to adversely affect water-dependent listed species. Straightforward mechanisms such as these allow applicants with expedient permit coverage, and eliminates "permit limbo" for the greatest number of permitted discharges. At the same time it is more protective of endangered species because it allows both agencies to focus on the real problems, and thus, provide endangered species protection in a more expeditious manner.

(4) Storm Water Discharges Associated with Inactive Mines, Landfills, Oil and Gas Operations that Are Located on Federal Lands. The permit does not cover storm water discharges associated with industrial activity from inactive mines, inactive landfills, and inactive oil and gas operations that are located on Federal lands, unless an operator of the industrial activity can be identified. These discharges are not eligible for coverage under this permit because they would more appropriately be covered by the permit currently under development by EPA intended specifically to cover these types of discharges.

III. Pollutants in Storm Water Discharges Associated with Industrial Activities in General

The volume and quality of storm water discharges associated with industrial activity will depend on a number of factors, including the industrial activities occurring at the facility, the nature of precipitation, and the degree of surface imperviousness. A discussion of these factors is provided in the proposed general permit (see FR 58 61146 Nov. 19, 1993).

IV. Summary of Options for Controlling Pollutants

Pollutants in storm water discharges from industrial plants may be reduced using the following methods: eliminating pollution sources, implementing Best Management Practices to prevent pollution, using traditional storm water management practices, and providing end-of-pipe treatment. Each of these is discussed in the proposed general permit (see 58 FR 61146, Nov. 19, 1993).

V. The Federal/Municipal Partnership: The Role of Municipal Operators of Large and Medium Municipal Separate Storm Sewer Systems

A key issue in developing a workable regulatory program for controlling pollutants in storm water discharges associated with industrial activity is the proper use and coordination of limited regulatory resources. This is especially important when addressing the appropriate role of municipal operators of large and medium municipal separate storm sewer systems in the control of pollutants in storm water associated with industrial activity which discharge through municipal separate storm sewer systems. The proposed general permit discussed several key policy factors (see 58 FR 61146).

VI. Summary of Common Permit Conditions

The following section describes the permit conditions common to discharges from all the industrial activities covered by today's permit. These conditions were proposed on November 19, 1993 (58 FR 61146), and reflect the baseline permit requirements established for most regulated industries in EPA's General Permits for Storm Water Discharges Associated with Industrial Activity [57 FR 41344–41356 September 9, 1992, and 57 FR 44438–44470 September 25, 1992]. Permit requirements which vary from industry to industry are discussed in Part VIII of this fact sheet.

A. Notification Requirements

General permits for storm water discharges associated with industrial activity require the submittal of an NOI prior to the authorization of such discharges (see 40 CFR 122.28(b)(2)(i), April 2, 1992 [57 FR 11394]). Consistent with these regulatory requirements, today's general permit establishes NOI requirements that operate in addition to the part 1 and part 2 group application requirements. To be covered under this permit, facilities, including members of an approved group, must submit an NOI and other required information within 90 days of the effective date of this permit. The NOI form is found in Addendum B.

1. Contents of NOIs

a. The operator's name, address, telephone number, and status as Federal, State, private, public, or other entity.

b. Street address of the facility for which the notification is submitted. Where a street address for the site is not available, the location can be described in terms of the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

c. An indication of whether the facility is located on Federal Indian Reservations.

d. Up to four 4-digit Standard Industrial Classification (SIC) codes that best represent the principal products or activities provided by the facility. For hazardous waste treatment, storage, or disposal facilities, land disposal facilities that receive or have received any industrial waste, steam electric power generating facilities, or treatment works treating domestic sewage, a 2-character code must be provided.

e. The permit number of any NPDES permit for any discharge (including non-storm water discharges) from the site that is currently authorized by an NPDES permit.

f. 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 receiving water(s) for the discharge through the municipal separate storm sewer.

g. The analytical monitoring status of the facility (monitoring or not).

h. For a co-permittee, if a storm water general permit number has been issued, it should be included.

i. A certification that the operator of the facility has read and understands the eligibility requirements for the permit and that the operator believes the facility to be in compliance with those requirements.

j. Identify type of permit requested (either baseline general, multi-sector, or construction); longitude and latitude; indication of presence of endangered species; indication of historic preservation agreement; signed certification stating compliance with the National Historic Preservation Act, Endangered Species Act, and the new source performance standard requirements.

k. For any facility that begins to discharge storm water associated with industrial activity after [insert date 270 days after permit finalization], a certification that a storm water pollution prevention plan has been prepared for the facility in accordance with Part IV of this permit. (A copy of the plan should not be included with the NOI submission.)

An NOI form is provided in Addendum B. The NOI must be signed in accordance with the signatory requirements of 40 CFR 122.22. A complete description of these signatory requirements is provided in the instructions accompanying the NOI. Completed NOI forms must be submitted to the Storm Water Notice of Intent (4203), 401 M Street SW., Washington, DC 20460.

2. Deadlines

Except for the special circumstances discussed below, dischargers who intend to obtain coverage under this permit for a storm water discharge from an industrial activity that is in existence prior to the date 90 days after permit issuance must submit an NOI on or before the date 90 days after permit issuance, and facilities that begin industrial activities after the date 90 days after permit issuance are required to submit an NOI at least 2 days prior to the commencement of the new industrial activity.

A discharger is not precluded from submitting an NOI at a later date. However, in such instances, EPA may bring appropriate enforcement actions.

The storm water regulations (40 CFR 122.27) require that facilities that discharge storm water associated with an industrial activity submit an application for permit coverage on or before October 1, 1992, except industrial activities owned or operated by a medium municipality, which had until May 17, 1993. Today's permit does not extend that application deadline. EPA intends that most of the facilities that will seek coverage under the final version of today's permit are: members of groups with approved applications; facilities that submitted a Notice of

Intent to be covered by EPA's baseline general permit and now wish to switch to coverage under today's permit; or have submitted a complete individual application but have not yet received an individual permit.

EPA may deny coverage under this permit and require submittal of an individual NPDES permit application based on a review of the completeness and/or content of the NOI or other information (e.g., Endangered Species Act compliance, National Historic Preservation Act Compliance, water quality information, compliance history, history of spills, etc.). Where EPA requires a discharger authorized under this general permit to apply for an individual NPDES permit (or an alternative general permit), EPA will notify the discharger in writing that a permit application (or different NOI) is required by an established deadline. Coverage under this industry general permit will automatically terminate if the discharger fails to submit the required permit application in a timely manner. Where the discharger does submit a requested permit application, coverage under this general permit will automatically terminate on the effective date of the issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee. Compliance deadlines are discussed in Part VI.H. of this fact sheet.

Municipal Separate Storm Sewer System Operator Notification

Operators of storm water discharges associated with industrial activity that discharge through a large or medium municipal separate storm sewer system or a municipal system designated by the Director,[4] must notify the municipal operator of the system receiving the discharge and submit a copy of their NOI to the municipal operator.

4. Notice of Termination

Where a discharger is able to eliminate the storm water discharges associated with industrial activity from a facility, the discharger may submit a Notice of Termination (NOT) form (or photocopy thereof) provided by the Director.

A copy of the NOT and instructions for completing the NOT are included in Addendum C. The NOT form requires the following information:

a. Name, mailing address, and location of the facility for which the notification is submitted. Where a street 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;

b. The name, address and telephone number of the operator addressed by the Notice of Termination;

c. The NPDES permit number for the storm water discharge associated with industrial activity identified by the NOT;

d. An indication of whether the storm water discharges associated with industrial activity have been eliminated or the operator of the discharges has changed; and

e. The following certification:

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 industrial activity. I understand that by submitting this Notice of Termination 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.

NOTs are to be sent to the Storm Water Notice of Termination (4203), 401 M Street, SW., Washington, DC 20460.

The NOT must be signed in accordance with the signatory requirements of 40 CFR 122.22. A complete description of these signatory requirements is provided in the instructions accompanying the NOT.

B. Special Conditions

The conditions of this permit have been designed to comply with the technology-based standards of the CWA (BAT/BCT). Based on a consideration of the appropriate factors for BAT and BCT requirements, and a consideration of the factors and options discussed in this fact sheet for controlling pollutants in storm water discharges associated with industrial activity, the general permit lists a set of tailored requirements for developing and implementing storm water pollution prevention plans, and for selected discharges, effluent limitations.[5]

Part VIII. of this fact sheet summarizes the options for controlling pollutants in storm water discharges associated with industrial activity. The permit includes numeric effluent limitations for coal pile runoff, contaminated runoff from fertilizer manufacturing facilities, runoff from asphalt emulsion manufacturing facilities, and material storage pile runoff located at cement manufacturing facilities or cement kilns.

For other discharges covered by the permit, the permit conditions reflect EPA's decision to identify a number of best management practices and traditional storm water management practices which prevent pollution in storm water discharges as the BAT/BCT level of control for the majority of storm water discharges covered by this permit. The permit conditions applicable to these discharges are not numeric effluent limitations, but rather are flexible requirements for developing and implementing site specific plans to minimize and control pollutants in storm water discharges associated with industrial activity. This approach is consistent with the approach used in the baseline general permits finalized on September 9, 1992 (57 FR 41236) and September 25, 1992 (57 FR 44438). In addition, today's general permit reflects information received through the group application process.

EPA is authorized under 40 CFR 122.44(k)(2) to impose BMPs in lieu of numeric effluent limitations in NPDES permits when the Agency finds numeric effluent limitations to be infeasible. EPA may also impose BMPs which are "reasonably necessary * * * to carry out the purposes of the Act" under 40 CFR 122.44(k)(3). Both of these standards for imposing BMPs were recognized in *NRDC* v. *Costle*, 568 F.2d 1369, 1380 (D.C. Cir. 1977). The conditions in the permit are issued under the authority of both of these regulatory provisions. The pollution prevention or BMP requirements in this permit operate as limitations on effluent discharges that reflect the application of BAT/BCT. This is because the BMPs identified require the use of source

[4] The terms large and medium municipal separate storm sewer systems (systems serving a population of 100,000 or more) are defined at 40 CFR 122.26(b)(4) and (7). Some of the cities and counties in which these systems are found are listed in Appendices F, G, H, and I to 40 CFR Part 122. Other municipal systems have been designated by EPA on a case-by-case basis or have brought into the program based upon the 1990 Census.

[5] Part I.C.2 of the general permit provides that facilities with storm water discharges associated with industrial activity which, based on an evaluation of site specific conditions, believe that the appropriate conditions of this permit do not adequately represent BAT and BCT requirements for the facility may submit to the Director an individual application (Form 1 and Form 2F). A detailed explanation of the reasons why the conditions of the available general permits do not adequately represent BAT and BCT requirements for the facility as well as any supporting documentation must be included.

control technologies which, in the context of this general permit, are the best available of the technologies economically achievable (or the equivalent BCT finding). See *NRDC* v. *EPA*, 822 F.2d 104, 122–23 (D.C. Cir. 1987) (EPA has substantial discretion to impose nonquantitative permit requirements pursuant to Section 402(a)(1)).

1. Prohibition of Non-storm Water Discharges

Today's general permit does not authorize non-storm water discharges that are mixed with storm water except as provided below. The only non-storm water discharges that are intended to be authorized under today's permit include discharges from fire fighting activities; fire hydrant flushings; potable water sources, including waterline flushings; irrigation drainage; lawn watering; routine external building washdown without detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; compressor condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents that are combined with storm water discharges associated with industrial activity.

To be authorized under the general permit, these sources of non-storm water (except flows from fire fighting activities) must be identified in the storm water pollution prevention plan prepared for the facility. (Plans and other plan requirements are discussed in more detail below). Where such discharges occur, the plan must also identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

Today's permit does not require pollution prevention measures to be identified and implemented for non-storm water flows from fire-fighting activities because these flows will generally be unplanned emergency situations where it is necessary to take immediate action to protect the public.

The prohibition of unpermitted non-storm water discharges in this permit ensures that non-storm water discharges (except for those classes of non-storm water discharges that are conditionally authorized in Part III.A.2.b.) are not inadvertently authorized by this permit. Where a storm water discharge is mixed with non-storm water that is not authorized by today's general permit or another NPDES permit, the discharger should submit the appropriate application forms (Forms 1, 2C, and/or 2E) to gain permit coverage of the non-storm water portion of the discharge.

2. Releases of Reportable Quantities of Hazardous Substances and Oil

a. This general permit provides that the discharge of hazardous substances or oil from a facility must be eliminated or minimized in accordance with the storm water pollution plan developed for the facility. Where a permitted storm water discharge contains a hazardous substance or oil in an amount equal to or in excess of a reporting quantity established under 40 CFR Part 117, or 40 CFR Part 302 during a 24-hour period, the following actions must be taken:

(1) Any person in charge of the facility that discharges hazardous substances or oil is required to notify the National Response Center (NRC) (800–424–8802; in the Washington, DC, metropolitan area, 202–426–2675) in accordance with the requirements of 40 CFR Part 117, and 40 CFR Part 302 as soon as they have knowledge of the discharge.

(2) The storm water pollution prevention plan for the facility must be modified within 14 calendar days of knowledge of the release to provide a description of the release, an account of the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and it must be modified where appropriate.

(3) The permittee must also submit to EPA within 14 calendar days of knowledge of the release a written description of the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and steps to be taken to modify the pollution prevention plan for the facility.

b. Anticipated discharges containing a hazardous substance in an amount equal to or in excess of reporting quantities are those caused by events occurring within the scope of the relevant operating system. Facilities that have more than 1 anticipated discharge per year containing a hazardous substance in an amount equal to or in excess of a reportable quantity are required to:

(1) Submit notifications of the first release that occurs during a calendar year (or for the first year of this permit, after submittal of an NOI); and

(2) Provide a written description in the storm water pollution prevention plan of the dates on which such releases occurred, the type and estimate of the amount of material released, and the circumstances leading to the releases. In addition, the pollution prevention plan must address measures to minimize such releases.

c. Where a discharge of a hazardous substance or oil in excess of reporting quantities is caused by a non-storm water discharge (e.g., a spill of oil into a separate storm sewer), that discharge is not authorized by this permit and the discharger must report the discharge as required under 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302. In the event of a spill, the requirements of Section 311 of the CWA and other applicable provisions of Sections 301 and 402 of the CWA continue to apply. This approach is consistent with the requirements for reporting releases of hazardous substances and oil that make a clear distinction between hazardous substances typically found in storm water discharges and those associated with spills that are not considered part of a normal storm water discharge (see 40 CFR 117.12(d)(2)(i)).

3. Co-located Industrial Facilities

Today's general permit addresses storm water discharges from industrial activities co-located at an industrial facility described in the coverage section of the permit. Co-located industrial activities occur when activities being conducted onsite meet more than one of the descriptions in the coverage sections of Part XI. of this permit (e.g., a landfill at a wood treatment facility or a vehicle maintenance garage at an asphalt batching plant). Co-located industrial activities are authorized under today's general permit provided that the industrial facility complies with the pollution prevention plan and monitoring requirements for each co-located activity.

Authorizing co-located discharges allows industrial facilities to develop pollution prevention plans that fully address all industrial activities at the site. For example, if a wood treatment facility has a landfill, the pollution prevention plan requirements for the wood treatment facility will differ greatly from those needed for a landfill. Therefore, by authorizing co-located industrial activities, the wood treatment facility will develop a pollution prevention plan to meet the requirements addressing the storm water discharges from the wood treatment facility and the landfill. The facility is also subject to applicable monitoring requirements for each type of industrial activity as described in the applicable sections of the permit. By

monitoring the discharges from the different industrial activities, the facility can better determine the effectiveness of the pollution prevention plan requirements for controlling storm water discharges from all activities.

C. Common Pollution Prevention Plan Requirements

All facilities intended to be covered by today's general permit for storm water discharges associated with industrial activity must prepare and implement a storm water pollution prevention plan. The storm water permit addresses pollution prevention plan requirements for a number of categories of industries. The following is a discussion of the common permit requirements for all industries; special requirements for storm water discharges associated with industrial activity through large and medium municipal separate storm sewer systems; special requirements for facilities subject to EPCRA Section 313 reporting requirements; and special requirements for facilities with outdoor salt storage piles. These are the permit requirements which apply to discharges associated with any of the industrial activities covered by today's permit. These common requirements may be amended or further clarified in the industry-specific pollution prevention plan requirements. Table 2 indicates the location of the industry-specific pollution prevention plans. These industry-specific requirements are additive for facilities where co-located industrial activities occur. For example, if a facility has both a sand and gravel mining operation and a ready mix concrete manufacturing operation, then that facility is subject to the pollution prevention plan requirements in both Part XI.E.3. and Part XI.J.3. of the permit.

TABLE 2.—STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

Industrial activity	Fact sheet section describing PPP requirements	Permit section describing PPP requirements
Timber Products Facilities	VIII.A.7	XI.A.3.
Paper and Allied Products Manufacturing Facilities	VIII.B.5	XI.B.3.
Chemical and Allied Products Manufacturing Facilities	VIII.C.6	XI.C.4.
Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers	VIII.D.4	XI.D.3.
Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities	VIII.E.5	XI.E.3.
Primary Metals Facilities	VIII.F.6	XI.F.3.
Metal Mining (Ore Mining and Dressing) Facilities	VIII.G.5	XI.G.3.
Coal Mines and Coal Mining-Related Facilities	VIII.H.4	XI.H.3.
Oil and Gas Extraction Facilities	VIII.I.5	XI.I.3.
Mineral Mining and Processing Facilities	VIII.J.4	XI.J.3.
Hazardous Waste Treatment, Storage, or Disposal Facilities	VIII.K.5	XI.K.3.
Landfills and Land Application Sites	VIII.L.5	XI.L.3.
Automobile Salvage Yards	VIII.M.5	XI.M.2.
Scrap and Waste Recycling Facilities	VIII.N.5	XI.N.3.
Steam Electric Power Generating Facilities, Including Coal Handling Areas	VIII.O.5	XI.O.3.
Vehicle Maintenance or Equipment Cleaning Areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and the United States Postal Service Transportation Facilities.	VIII.P.5	XI.P.3.
Vehicle Maintenance Areas and/or Equipment Cleaning Operations at Water Transportation Facilities.	VIII.Q.5	XI.Q.3.
Ship and Boat Building or Repairing Yards	VIII.R.6	XI.R.3.
Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities.	VIII.S.4	XI.S.3.
Treatment Works	VIII.T.5	XI.T.3.
Food and Kindred Products Facilities	VIII.U.4	XI.U.3.
Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities	VIII.V.5	XI.V.3.
Wood and Metal Furniture and Fixture Manufacturing Facilities	VIII.W.4	XI.W.3.
Printing and Publishing Facilities	VIII.X.5	XI.X.3.
Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries	VIII.Y.4	XI.Y.3.
Leather Tanning and Finishing Facilities	VIII.Z.5	XI.Z.3.
Fabricated Metal Products Industry	VIII.AA.3	XI.AA.3.
Facilities That Manufacture Transportation Equipment, Industrial, or Commercial Machinery.	VIII.AB.5	XI.AB.3.
Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods.	VIII.AC.5	XI.AC.3.

The pollution prevention approach in today's general permit focuses on two major objectives: (1) to identify sources of pollution potentially affecting the quality of storm water discharges associated with industrial activity from the facility; and (2) to describe and ensure implementation of practices to minimize and control pollutants in storm water discharges associated with industrial activity from the facility and to ensure compliance with the terms and conditions of this permit.

The storm water pollution prevention plan requirements in the general permit are intended to facilitate a process whereby the operator of the industrial facility thoroughly evaluates potential pollution sources at the site and selects and implements appropriate measures designed to prevent or control the discharge of pollutants in storm water runoff. The process involves the following four steps: (1) Formation of a team of qualified plant personnel who will be responsible for preparing the plan and assisting the plant manager in its implementation; (2) assessment of potential storm water pollution sources; (3) selection and implementation of appropriate management practices and controls; and (4) periodic evaluation of the effectiveness of the plan to prevent

storm water contamination and comply with the terms and conditions of this permit. The authorization to include best management practices in the permit to control or abate the discharge of pollutants is derived from 40 CFR 144.45(k).

EPA believes the pollution prevention approach is the most environmentally sound and cost-effective way to control the discharge of pollutants in storm water runoff from industrial facilities. This position is supported by the results of a comprehensive technical survey EPA completed in 1979.[6] The survey found that two classes of management practices are generally employed at industries to control the nonroutine discharge of pollutants from sources such as storm water runoff, drainage from raw material storage and waste disposal areas, and discharges from places where spills or leaks have occurred. The first class of management practices includes those that are low in cost, applicable to a broad class of industries and substances, and widely considered essential to a good pollution control program. Some examples of practices in this class are good housekeeping, employee training, and spill response and prevention procedures. The second class includes management practices that provide a second line of defense against the release of pollutants. This class addresses containment, mitigation, and cleanup. Since publication of the 1979 survey, EPA has imposed management practices and controls in NPDES permits on a case-by-case basis. The Agency also has continued to review the appropriateness and effectiveness of such practices,[7] as well as the techniques used to prevent and contain oil spills.[8] Experience with these practices and controls has shown that they can be used in permits to reduce pollutants in storm water discharges in a cost-effective manner. In keeping with both the present and previous administration's objective to attain environmental goals through pollution prevention, pollution prevention has been and continues to be the cornerstone of the NPDES Permitting program for storm water. EPA has developed guidance entitled "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," September 1992, to assist permittees in developing and implementing pollution prevention measures.

1. Pollution Prevention Team

As a first step in the process of developing and implementing a storm water pollution prevention plan, permittees are required to identify a qualified individual or team of individuals to be responsible for developing the plan and assisting the facility or plant manager in its implementation. When selecting members of the team, the plant manager should draw on the expertise of all relevant departments within the plant to ensure that all aspects of plant operations are considered when the plan is developed. The plan must clearly describe the responsibilities of each team member as they relate to specific components of the plan. In addition to enhancing the quality of communication between team members and other personnel, clear delineation of responsibilities will ensure that every aspect of the plan is addressed by a specified individual or group of individuals. Pollution Prevention Teams may consist of one individual where appropriate (e.g., in certain small businesses with limited storm water pollution potential).

2. Description of Potential Pollution Sources

Each storm water pollution prevention plan must describe activities, materials, and physical features of the facility that may contribute significant amounts of pollutants to storm water runoff or, during periods of dry weather, result in pollutant discharges through the separate storm sewers or storm water drainage systems that drain the facility. This assessment of storm water pollution risk will support subsequent efforts to identify and set priorities for necessary changes in materials, materials management practices, or site features, as well as aid in the selection of appropriate structural and nonstructural control techniques. Some operators may find that significant amounts of pollutants are running onto the facility property. Such operators should identify and address the contaminated runon in the storm water pollution prevention plan. If the runon cannot be addressed or diverted by the permittee, the permitting authority should be notified. If necessary, the permitting authority may require the operator of the adjacent facility to obtain a permit.

Part XI of the permit includes specific requirements for the various industry sectors covered by today's permit. The storm water pollution prevention plans generally must describe the following elements:

a. Drainage. The plan must contain a map of the site that shows the location of outfalls covered by the permit (or by other NPDES permits), the pattern of storm water drainage, an indication of the types of discharges contained in the drainage areas of the outfalls, structural features that control pollutants in runoff,[9] surface water bodies (including wetlands), places where significant materials [10] are exposed to rainfall and runoff, and locations of major spills and leaks that occurred in the 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit. The map also must show areas where the following activities take place: fueling, vehicle and equipment maintenance and/or cleaning, loading and unloading, material storage (including tanks or other vessels used for liquid or waste storage), material processing, and waste disposal. For areas of the facility that generate storm water discharges with a reasonable potential to contain significant amounts of pollutants, the map must indicate the probable direction of storm water flow and the pollutants likely to be in the discharge. Flows with a significant potential to cause soil erosion also must be identified. In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

b. Inventory of Exposed Materials. Facility operators are required to

[6] See "Storm Water Management for Industrial Activities," EPA, September 1992, EPA–832–R–92–006.

[7] For example, see "Best Management Practices: Useful Tools for Cleaning Up," Thron, H. Rogoshewski, P., 1982, Proceedings of the 1982 Hazardous Material Spills Conference; "The Chemical Industries' Approach to Spill Prevention," Thompson, C., Goodier, J. 1980, Proceedings of the 1980 National Conference of Control of Hazardous Materials Spills; a series of EPA memorandum entitled "Best Management Practices in NPDES Permits—Information Memorandum," 1983, 1985, 1986, 1987, 1988; Review of Emergency Systems: Report to Congress," EPA, 1988; and "Analysis of Implementing Permitting Activities for Storm Water Discharges Associated with Industrial Activity," EPA, 1991.

[8] See for example, "The Oil Spill Prevention, Control and Countermeasures Program Task Force Report," EPA, 1988; and "Guidance Manual for the Development of an Accidental Spill Prevention Program," prepared by SAIC for EPA, 1986.

[9] Nonstructural features such as grass swales and vegetative buffer strips also should be shown.

[10] Significant materials include, but are not limited to the following: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials, such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); any chemical the facility is required to report pursuant to EPCRA Section 313; fertilizers; pesticides; and waste products, such as ashes, slag, and sludge that have the potential to be released with storm water discharges. (See 40 CFR 122.26(b)(8)).

carefully conduct an inspection of the site and related records to identify significant materials that are or may be exposed to storm water. The inventory must address materials that within 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit have been handled, stored, processed, treated, or disposed of in a manner to allow exposure to storm water. Findings of the inventory must be documented in detail in the pollution prevention plan. At a minimum, the plan must describe the method and location of onsite storage or disposal; practices used to minimize contact of materials with rainfall and runoff; existing structural and nonstructural controls that reduce pollutants in runoff; and any treatment the runoff receives before it is discharged to surface waters or a separate storm sewer system. The description must be updated whenever there is a significant change in the types or amounts of materials, or material management practices, that may affect the exposure of materials to storm water.

c. Significant Spills and Leaks. The plan must include a list of any significant spills and leaks of toxic or hazardous pollutants that occurred in the 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit. Significant spills include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under Section 311 of CWA (see 40 CFR 110.10 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (see 40 CFR 302.4). Significant spills may also include releases of oil or hazardous substances that are not in excess of reporting requirements and releases of materials that are not classified as oil or a hazardous substance.

The listing should include a description of the causes of each spill or leak, the actions taken to respond to each release, and the actions taken to prevent similar such spills or leaks in the future. This effort will aid the facility operator as she or he examines existing spill prevention and response procedures and develops any additional procedures necessary to fulfill the requirements of Part XI. of this permit.

d. Non-storm Water Discharges. Each pollution prevention plan must include a certification, signed by an authorized individual, that discharges from the site have been tested or evaluated for the presence of non-storm water discharges. The certification must describe possible significant sources of non-storm water, the results of any test and/or evaluation conducted to detect such discharges, the test method or evaluation criteria used, the dates on which tests or evaluations were performed, and the onsite drainage points directly observed during the test or evaluation. Acceptable test or evaluation techniques include dye tests, television surveillance, observation of outfalls or other appropriate locations during dry weather, water balance calculations, and analysis of piping and drainage schematics.[11]

Except for flows that originate from fire fighting activities, sources of non-storm water that are specifically identified in the permit as being eligible for authorization under the general permit must be identified in the plan. Pollution prevention plans must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water discharge.

EPA recognizes that certification may not be feasible where facility personnel do not have access to an outfall, manhole, or other point of access to the conduit that ultimately receives the discharge. In such cases, the plan must describe why certification was not feasible. Permittees who are not able to certify that discharges have been tested or evaluated must notify the Director in accordance with Part XI. of the permit.

e. Sampling Data. Any existing data on the quality or quantity of storm water discharges from the facility must be described in the plan, including data collected for part 2 of the group application process. These data may be useful for locating areas that have contributed pollutants to storm water. The description should include a discussion of the methods used to collect and analyze the data. Sample collection points should be identified in the plan and shown on the site map.

f. Summary of Potential Pollutant Sources. The description of potential pollution sources culminates in a narrative assessment of the risk potential that sources of pollution pose to storm water quality. This assessment should clearly point to activities, materials, and physical features of the facility that have a reasonable potential to contribute significant amounts of pollutants to storm water. Any such activities, materials, or features must be addressed by the measures and controls subsequently described in the plan. In conducting the assessment, the facility operator must consider the following activities: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and onsite waste disposal practices. The assessment must list any significant pollution sources at the site and identify the pollutant parameter or parameters (i.e., biochemical oxygen demand, suspended solids, etc.) associated with each source.

3. Measures and Controls

Following completion of the source identification and assessment phase, the permit requires the permittee to evaluate, select, and describe the pollution prevention measures, best management practices (BMPs), and other controls that will be implemented at the facility. BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices that prevent or reduce the discharge of pollutants in storm water runoff.

EPA emphasizes the implementation of pollution prevention measures and BMPs that reduce possible pollutant discharges at the source. Source reduction measures include, among others, preventive maintenance, chemical substitution, spill prevention, good housekeeping, training, and proper materials management. Where such practices are not appropriate to a particular source or do not effectively reduce pollutant discharges, EPA supports the use of source control measures and BMPs such as material segregation or covering, water diversion, and dust control. Like source reduction measures, source control measures and BMPs are intended to keep pollutants out of storm water. The remaining classes of BMPs, which involve recycling or treatment of storm water, allow the reuse of storm water or attempt to lower pollutant concentrations prior to discharge.

The pollution prevention plan must discuss the reasons each selected control or practice is appropriate for the facility and how each will address one or more of the potential pollution sources identified in the plan. The plan also must include a schedule specifying the time or times during which each control or practice will be implemented. In addition, the plan should discuss ways in which the controls and practices relate to one another and, when taken as a whole, produce an integrated and consistent approach for preventing or controlling potential storm water contamination problems. The permit requirements included for the various industry sectors in Part XI

[11] In general, smoke tests should not be used for evaluating the discharge of non-storm water to a separate storm sewer as many sources of non-storm water typically pass through a trap that would limit the effectiveness of the smoke test.

of today's permit generally require that the portion of the plan that describes the measures and controls address the following minimum components.

When "minimize/reduce" is used relative to pollution prevention plan measures, EPA means to consider and implement best management practices that will result in an improvement over the baseline conditions as it relates to the levels of pollutants identified in storm water discharges with due consideration to economic feasibility and effectiveness.

a. Good Housekeeping. Good housekeeping involves using practical, cost-effective methods to identify ways to maintain a clean and orderly facility and keep contaminants out of separate storm sewers. It includes establishing protocols to reduce the possibility of mishandling chemicals or equipment and training employees in good housekeeping techniques. These protocols must be described in the plan and communicated to appropriate plant personnel.

b. Preventive Maintenance. Permittees must develop a preventive maintenance program that involves regular inspection and maintenance of storm water management devices and other equipment and systems. The program description should identify the devices, equipment, and systems that will be inspected; provide a schedule for inspections and tests; and address appropriate adjustment, cleaning, repair, or replacement of devices, equipment, and systems. For storm water management devices such as catch basins and oil/water separators, the preventive maintenance program should provide for periodic removal of debris to ensure that the devices are operating efficiently. For other equipment and systems, the program should reveal and enable the correction of conditions that could cause breakdowns or failures that may result in the release of pollutants.

c. Spill Prevention and Response Procedures. Based on an assessment of possible spill scenarios, permittees must specify appropriate material handling procedures, storage requirements, containment or diversion equipment, and spill cleanup procedures that will minimize the potential for spills and in the event of a spill enable proper and timely response. Areas and activities that typically pose a high risk for spills include loading and unloading areas, storage areas, process activities, and waste disposal activities. These activities and areas, and their accompanying drainage points, must be described in the plan. For a spill prevention and response program to be effective, employees should clearly understand the proper procedures and requirements and have the equipment necessary to respond to spills.

d. Inspections. In addition to the comprehensive site evaluation, facilities are required to conduct periodic inspections of designated equipment and areas of the facility. Industry-specific requirements for such inspections, if any, are discussed in Section VIII. of this fact sheet. When required, qualified personnel must be identified to conduct inspections at appropriate intervals specified in the plan. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained. These periodic inspections are different from the comprehensive site evaluation, even though the former may be incorporated into the latter. Equipment, area, or other inspections are typically visual and are normally conducted on a regular basis, e.g., daily inspections of loading areas. Requirements for such periodic inspections are specific to each industrial sector in today's permit, whereas the comprehensive site compliance evaluation is required of all industrial sectors. Area inspections help ensure that storm water pollution prevention measures (e.g., BMPs) are operating and properly maintained on a regular basis. The comprehensive site evaluation is intended to provide an overview of the entire facility's pollution prevention activities. Refer to Part VI.C.4. below for more information on the comprehensive site evaluation.

e. Employee Training. The pollution prevention plan must describe a program for informing personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. The training program should address topics such as good housekeeping, materials management, and spill response procedures. Where appropriate, contractor personnel also must be trained in relevant aspects of storm water pollution prevention. A schedule for conducting training must be provided in the plan. Several sections in Part XI. of today's permit specify a minimum frequency for training of once per year. Others indicate that training is to be conducted at an appropriate interval. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to the storm water pollution prevention plan.

f. Recordkeeping and Internal Reporting Procedures. The pollution prevention plan must describe procedures for developing and retaining records on the status and effectiveness of plan implementation. At a minimum, records must address spills, monitoring, and inspection and maintenance activities. The plan also must describe a system that enables timely reporting of storm water management-related information to appropriate plant personnel.

g. Sediment and Erosion Control. The pollution prevention plan must identify areas that, due to topography, activities, soils, cover materials, or other factors have a high potential for significant soil erosion. The plan must identify measures that will be implemented to limit erosion in these areas.

h. Management of Runoff. The plan must contain a narrative evaluation of the appropriateness of traditional storm water management practices (i.e., practices other than those that control pollutant sources) that divert, infiltrate, reuse, or otherwise manage storm water runoff so as to reduce the discharge of pollutants. Appropriate measures may include, among others, vegetative swales, collection and reuse of storm water, inlet controls, snow management, infiltration devices, and wet detention/retention basins.

Based on the results of the evaluation, the plan must identify practices that the permittee determines are reasonable and appropriate for the facility. The plan also should describe the particular pollutant source area or activity to be controlled by each storm water management practice. Reasonable and appropriate practices must be implemented and maintained according to the provisions prescribed in the plan.

In selecting storm water management measures, it is important to consider the potential effects of each method on other water resources, such as ground water. Although storm water pollution prevention plans primarily focus on storm water management, facilities must also consider potential ground water pollution problems and take appropriate steps to avoid adversely impacting ground water quality. For example, if the water table is unusually high in an area, an infiltration pond may contaminate a ground water source unless special preventive measures are taken. Under EPA's July 1991 Ground Water Protection Strategy, States are encouraged to develop Comprehensive State Ground Water Protection Programs (CSGWPP). Efforts to control storm water should be compatible with State ground water objectives as reflected in CSGWPPs.

4. Comprehensive Site Compliance Evaluation

The permit requires that the storm water pollution prevention plan describe the scope and content of the comprehensive site evaluations that qualified personnel will conduct to (1) confirm the accuracy of the description of potential pollution sources contained in the plan, (2) determine the effectiveness of the plan, and (3) assess compliance with the terms and conditions of the permit. Note that the comprehensive site evaluations are not the same as periodic or other inspections described for certain industries under Part VI.C.3.d of this fact sheet. However, in the instances when frequencies of inspections and the comprehensive site compliance evaluation overlap they may be combined allowing for efficiency, as long as the requirements for both types of inspections are met. The plan must indicate the frequency of comprehensive evaluations which must be at least once a year, except where comprehensive site evaluations are shown in the plan to be impractical for inactive mining sites, due to remote location and inaccessibility. [12] The individual or individuals who will conduct the comprehensive site evaluation must be identified in the plan and should be members of the pollution prevention team. Material handling and storage areas and other potential sources of pollution must be visually inspected for evidence of actual or potential pollutant discharges to the drainage system. Inspectors also must observe erosion controls and structural storm water management devices to ensure that each is operating correctly. Equipment needed to implement the pollution prevention plan, such as that used during spill response activities, must be inspected to confirm that it is in proper working order.

The results of each comprehensive site evaluation must be documented in a report signed by an authorized company official. The report must describe the scope of the comprehensive site evaluation, the personnel making the comprehensive site evaluation, the date(s) of the comprehensive site evaluation, and any major observations relating to implementation of the storm water pollution prevention plan. Comprehensive site evaluation reports must be retained for at least 3 years after the date of the evaluation. Based on the results of each comprehensive site evaluation, the description in the plan of potential pollution sources and measures and controls must be revised as appropriate within 2 weeks after each comprehensive site evaluation, unless indicated otherwise in Section XI of the permit. Changes in procedural operations must be implemented on the site in a timely manner for non-structural measures and controls not more than 12 weeks after completion of the comprehensive site evaluation. Procedural changes that require construction of structural measures and controls are allowed up to 3 years for implementation. In both instances, an extension may be requested from the Director.

D. Special Requirements

1. Special Requirements for Storm Water Discharges Associated With Industrial Activity Through Large and Medium Municipal Separate Storm Sewer Systems

Permittees that discharge storm water associated with industrial activity through large or medium municipal separate storm sewer systems [13] are required to submit notification of the discharge to the operator of the municipal separate storm sewer system. A list of these systems is provided in Addendum D of today's notice.

Facilities covered by this permit must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions. In addition, permittees that discharge storm water associated with industrial activity through a large or medium municipal separate storm sewer system must make their pollution prevention plans available to the municipal operator of the system upon request by the municipal operator.

2. Special Requirements for Storm Water Discharges Associated With Industrial Activity From Facilities Subject to EPCRA Section 313 Requirements

Today's permit contains special requirements for certain permittees subject to reporting requirements under Section 313 of the EPCRA (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA)). EPCRA Section 313 requires operators of certain facilities that manufacture (including import), process, or otherwise use listed toxic chemicals to report annually their releases of those chemicals to any environmental media. Listed toxic chemicals include more than 500 chemicals and chemical classes listed at 40 CFR Part 372 (including the recently added chemicals published November 30, 1994).

The criteria for facilities that must report under Section 313 are given at 40 CFR 372.22. A facility is subject to the annual reporting provisions of Section 313 if it meets all three of the following criteria for a calendar year: it is included in SIC codes 20 through 39; it has 10 or more full-time employees; and it manufactures (including imports), processes, or otherwise uses a chemical listed in 40 CFR 372.65 in amounts greater than the "threshold" quantities specified in 40 CFR 372.25.

There are more than 300 individually listed Section 313 chemicals, as well as 20 categories of Toxic Release Inventory (TRI) chemicals for which reporting is required. EPA has the authority to add to and delete from this list. The Agency has identified approximately 175 chemicals that it is classifying for the purposes of this general permit as "Section 313 water priority chemicals." For the purposes of this permit, Section 313 water priority chemicals are defined as chemicals or chemical categories that (1) are listed at 40 CFR 372.65 pursuant to EPCRA Section 313; (2) are manufactured, processed, or otherwise used at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and (3) meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic toxicity criteria. A list of the water priority chemicals is provided in Addendum F to today's notice. In today's permit, EPA is not extending the special requirements to facilities that store liquid chemicals in above-ground tanks or handle liquid chemicals in areas exposed to precipitation if such facilities are not subject to EPCRA Section 313 reporting requirements.

[12] Where annual site inspections are shown in the plan to be impractical for inactive mining sites, due to remote location and inaccessibility, site inspections must be conducted at least once every 3 years.

[13] Large and medium municipal separate storm sewer systems are systems located in an incorporated city with a population of 100,000 or more, or in a county identified as having a large or medium system (see 40 CFR 122.26(b) (4) and (7) and Appendices F through I to Part 122). A list of these municipalities is provided in Addendum D to today's notice.

a. Summary of Special Requirements. The special requirements in today's permit for facilities subject to reporting requirements under EPCRA Section 313 for a water priority chemical, except those that are handled and stored only in gaseous or non-soluble liquids or solids (at atmospheric pressure and temperature) forms (see Part VI.D.2.c below), state that storm water pollution prevention plans, in addition to the baseline requirements for plans, must contain special provisions addressing areas where Section 313 water priority chemicals are stored, processed, or otherwise handled. These requirements reflect the Best Available Technology for controlling discharges of water priority chemicals in storm water. The permit provides that appropriate containment, drainage control, and/or diversionary structures must be provided for such areas. An exemption from the special provisions for Section 313 facilities will be granted if the facility can certify in the pollution prevention plan that all water priority chemicals handled or used are gaseous or non-soluble liquids or solids (at atmospheric pressure and temperature). At a minimum, one of the following preventive systems or its equivalent must be used: curbing, culverting, gutters, sewers, or other forms of drainage control to prevent or minimize the potential for storm water runon to come into contact with significant sources of pollutants; or roofs, covers, or other forms of appropriate protection to prevent storage piles from exposure to storm water and wind.

In addition, the permit establishes requirements for priority areas of the facility. Priority areas of the facility include the following: liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals; material storage areas for Section 313 water priority chemicals other than liquids; truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals; and areas where Section 313 water priority chemicals are transferred, processed, or otherwise handled.

The permit provides that site runoff from other industrial areas of the facility that may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals must incorporate the necessary drainage or other control features to prevent the discharge of spilled or improperly disposed material and to ensure the mitigation of pollutants in runoff or leachate. The permit also establishes special requirements for preventive maintenance and good housekeeping, facility security, and employee training.

In the proposed permit, EPA proposed to require facilities subject to EPCRA Section 313 requirements to have a Registered Professional Engineer (PE) certify their pollution prevention plans every 3 years. However, in response to commentors' concerns, EPA has revised the permit to eliminate the PE certification requirement. Instead, the permit now requires facilities subject to the special requirements to satisfy the pollution prevention plan signature requirements in Part IV.B.1. of the permit. EPA agrees with commentors that the operator is the most appropriate person to perform the certification. In addition, instead of certifying the plan every 3 years, facilities subject to EPCRA Section 313 requirements must amend the pollution prevention plan only when significant modifications are made to the facility, such as the addition of material handling areas or chemical storage units.

b. Requirements for Priority Areas. The permit provides that drainage from priority areas should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these must be manually activated. Flapper-type drain valves must not be used to drain containment areas, as these will not effectively control spills. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design. If facility drainage does not meet these requirements, the final discharge conveyance of all in-facility storm sewers must be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material or contaminated storm water to the facility. Records must be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

Additional special requirements are related to the types of industrial activities that occur within the priority area. These requirements are summarized below:

(1) Liquid Storage Areas. Where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals, the material and construction of tanks or containers used for the storage of a Section 313 water priority chemical must be compatible with the material stored and conditions of storage, such as pressure and temperature. Liquid storage areas for Section 313 water priority chemicals must be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures. A strong spill contingency plan would typically contain, at a minimum, a description of response plans, personnel needs, and methods of mechanical containment (such as use of sorbents, booms, collection devices, etc.), steps to taken for removal of spill chemicals or materials, and procedures to ensure access to and availability of sorbents and other equipment. The testing component of the plan would provide for conducting integrity testing of storage tanks at set intervals such as once every 5 years, and conducting integrity and leak testing of valves and piping at a minimum frequency, such as once per year. In addition, a strong plan would include a written and actual commitment of manpower, equipment and materials required to comply with the permit and to expeditiously control and remove any quantity of spilled or leaked chemicals that may result in a toxic discharge.

(2) Other Material Storage Areas. Material storage areas for Section 313 water priority chemicals other than liquids that are subject to runoff, leaching, or wind must incorporate drainage or other control features to minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

(3) Truck and Rail Car Loading and Unloading Areas. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals must be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include the placement and maintenance of drip pans (including the proper disposal of materials collected in the drip pans) where spillage may occur (such as hose connections, hose reels, and filler nozzles) when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

(4) Other Transfer, Process, or Handling Areas. Processing equipment and materials handling equipment must be operated to minimize discharges of Section 313 water priority chemicals.

Materials used in piping and equipment must be compatible with the substances handled. Drainage from process and materials handling areas must minimize storm water contact with Section 313 water priority chemicals. Additional protection such as covers or guards to prevent exposure to wind, spraying or releases from pressure relief vents to prevent a discharge of Section 313 water priority chemicals to the drainage system, and overhangs or door skirts to enclose trailer ends at truck loading/unloading docks must be provided as appropriate. Visual inspections or leak tests must be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

c. Today's permit allows facilities to provide a certification, signed in accordance with Part VII.G. (signatory requirements) of this permit, that all Section 313 water priority chemicals handled and/or stored onsite are only in gaseous or non-soluble liquid or solid (at atmospheric pressure and temperature) forms in lieu of the additional requirements in Part VI.E.2 of today's permit. By allowing such a certification, EPA hopes to limit the application of the special requirements Part IV.E.2. of the permit to those facilities with 313 water priority chemicals that truly have the potential to contaminate storm water discharges associated with industrial activity.

3. Special Requirements for Storm Water Discharges Associated With Industrial Activity From Salt Storage Facilities

Today's general permit contains special requirements for storm water discharges associated with industrial activity from salt storage facilities. Storage piles of salt used for deicing or other commercial or industrial purposes must be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile. This requirement only applies to runoff from storage piles discharged to waters of the United States. Facilities that collect all of the runoff from their salt piles and reuse it in their processes or discharge it subject to a separate NPDES permit do not need to enclose or cover their piles. Permittees must comply with this requirement as expeditiously as practicable, but in no event later than 3 years from the date of permit issuance.

These special requirements have been included in today's permit based on human health and aquatic effects resulting from storm water runoff from salt storage piles compounded with the prevalence of salt storage piles across the United States.

4. Consistency With Other Plans

Storm water pollution prevention plans may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under Section 311 of the CWA or Best Management Practices (BMP) Programs otherwise required by an NPDES permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

E. Monitoring and Reporting Requirements

The permit contains three general types of monitoring requirements: analytical monitoring or chemical monitoring; compliance monitoring for effluent guidelines compliance, and visual examinations of storm water discharges. This section provides a general description of each of these types of monitoring. Actual monitoring requirements for a given facility under the permit will vary depending upon the industrial activities that occur at a facility and the criteria for determining monitoring used to develop the permit. Table 3 lists the sections of the permit and of this fact sheet that describe the monitoring requirements as they apply to the specific industrial activities eligible for coverage under the permit. These are minimum monitoring requirements and if a permittee so chooses, he may conduct additional sampling to acquire more data to improve the statistical validity of the results. Through increased analytical or visual monitoring the permittee may be able to better ascertain the effectiveness of their pollution prevention plan.

Analytical monitoring requirements involve laboratory chemical analyses of samples collected by the permittee. The results of the analytical monitoring are quantitative concentration values for different pollutants, which can be easily compared to the results from other sampling events, other facilities, or to National benchmarks. Section VI.E.1. describes the analytical monitoring requirements and the process and criteria by which an industry sector or subsector was selected for analytical monitoring. Compliance monitoring requirements are imposed under today's permit to insure that discharges subject to numerical effluent limitations under the storm water effluent limitations guidelines are in compliance with those limitations. The compliance monitoring requirements are explained in Section VI.E.2.

Visual examinations of storm water discharges are the least burdensome type of monitoring requirement under the permit. Almost all of the industrial activities are required to perform visual examinations of their storm water discharges when they are occurring on a quarterly basis. Visual examinations are described in Section VI.E.8.

TABLE 3.—STORM WATER MONITORING REQUIREMENTS

Industrial activity	Section of fact sheet describing monitoring requirements	Permit section describing monitoring requirements
Timber Products Facilities*	VIII.A.8	XI.A.5.
Paper and Allied Products Manufacturing Facilities*	VIII.B.7	XI.B.5.
Chemical and Allied Products Manufacturing Facilities*	VIII.C.8	XI.C.5.
Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers*	VIII.D.5	XI.D.5.
Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities*	VIII.E.7	XI.E.5.
Primary Metals Facilities*	VIII.F.7	XI.F.5.
Metal Mining (Ore Mining and Dressing) Facilities*	VIII.G.8	XI.G.5.
Coal Mines and Coal Mining-Related Facilities*	VIII.H.6	XI.H.5.
Oil and Gas Extraction Facilities*	VIII.I.7	XI.I.5.
Mineral Mining and Processing Facilities*	VIII.J.6	XI.J.5.
Hazardous Waste Treatment, Storage, or Disposal Facilities*	VIII.K.7	XI.K.5.
Landfills and Land Application Sites*	VIII.L.6	XI.L.5.

TABLE 3.—STORM WATER MONITORING REQUIREMENTS—Continued

Industrial activity	Section of fact sheet describing monitoring requirements	Permit section describing monitoring requirements
Automobile Salvage Yards*	VIII.M.6	XI.M.5.
Scrap and Waste Recycling Facilities*	VIII.N.6	XI.N.5.
Steam Electric Power Generating Facilities, Including Coal Handling Areas*	VIII.O.6	XI.O.5.
Vehicle Maintenance or Equipment Cleaning Areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and the United States Postal Service Transportation Facilities.	VIII.P.6	XI.P.5
Vehicle Maintenance Areas and/or Equipment Cleaning Operations at Water Transportation Facilities*	VIII.Q.6	XI.Q.5.
Ship and Boat Building or Repairing Yards	VIII.R.6	XI.R.5.
Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities*.	VIII.S.6	XI.S.5.
Treatment Works*	VIII.T.6	XI.T.5.
Food and Kindred Products Facilities*	VIII.U.5	XI.U.5.
Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities*	VIII.V.6	XI.V.5.
Wood and Metal Furniture and Fixture Manufacturing Facilities	VIII.W.5	XI.W.5.
Printing and Publishing Facilities	VIII.X.7	XI.X.5.
Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries*	VIII.Y.7	XI.Y.5.
Leather Tanning and Finishing Facilities	VIII.Z.7	XI.Z.5.
Fabricated Metal Products Industry*	VIII.AA.7	XI.AA.5.
Facilities That Manufacture Transportation Equipment, Industrial, or Commercial Machinery	VIII.AB.7	XI.AB.5.
Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods.	VIII.AC.7	XI.AC.5.

* Denotes a sector that contains analytical monitoring requirements for an entire sector or a subsector.

1. Analytical Monitoring Requirements.

Today's permit requires analytical monitoring for discharges from certain classes of industrial facilities. EPA believes that industries may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of a storm water pollution prevention plan discussed in today's permit. Analytical monitoring is a means by which to measure the concentration of a pollutant in a storm water discharge. Analytical results are quantitative and therefore can be used to compare results from discharge to discharge and to quantify the improvement in storm water quality attributable to the storm water pollution prevention plan, or to identify a pollutant that is not being successfully controlled by the plan. EPA realizes there are greater cost burdens associated with analytical monitoring in comparison to visual examinations. Today's permit only requires analytical monitoring for the industry sectors or subsectors that demonstrated a potential to discharge pollutants at concentrations of concern.

To determine the industry sectors and subsectors that would be subject to analytical monitoring requirements contained in the sections listed in Table 3, EPA reviewed the data submitted in the group application process. First, EPA divided the Part 1 and Part 2 application data by the industry sectors listed in Table 3. Where a sector was found to contain a wide range of industrial activities or potential pollutant sources, it was further subdivided into the industry subsectors listed in Table 4. Next, EPA reviewed the information submitted in Part 1 of the group applications regarding the industrial activities, significant materials exposed to storm water, and the material management measures employed. This information helped identify potential pollutants that may be present in the storm water discharges. Then, EPA entered into a database, the sampling data submitted in Part 2 of the group applications. That data was arrayed according to industrial sector and subsector for the purposes of determining when analytical monitoring would be appropriate. Data received by EPA prior to January 1, 1993 (three months after the application deadline) were entered into EPA's database. Some additional data that was submitted even after January 1, 1993 was also entered into the database to bolster the data set for some sectors or subsectors (e.g., the auto salvage industry). All data submitted even later by group applicants which was not loaded into the database was reviewed by EPA during development of the permit. EPA notes that preliminary copies of the database were distributed to the public upon request in advance of a complete screening of the quality of the data set. These copies of the database contained a variety of errors that were screened and removed prior to EPA statistical analysis and evaluation of the results. The results of the statistical analyses are presented in the appropriate section of the fact sheet referenced in Table 3.

TABLE 4.—SECTOR/SUBSECTOR DIVISION OF GROUP APPLICANTS FOR ANALYSES OF SAMPLING DATA

Subsector	SIC code	Activity represented
		Sector A. Timber Products
1*	2421	General Sawmills and Planning Mills.
2	2491	Wood Preserving.
3*	2411	Log Storage and Handling.
4*	2426	Hardwood Dimension and Flooring Mills.

TABLE 4.—SECTOR/SUBSECTOR DIVISION OF GROUP APPLICANTS FOR ANALYSES OF SAMPLING DATA—Continued

Subsector	SIC code	Activity represented
	2429	Special Product Sawmills, Not Elsewhere Classified.
	243X	Millwork, Veneer, Plywood, and Structural Wood.
	244X	Wood Containers.
	245X	Wood Buildings and Mobile Homes.
	2493	Reconstituted Wood Products.
	2499	Wood Products, Not Elsewhere Classified.
Sector B. Paper and Allied Products Manufacturing		
1	261X	Pulp Mills.
2	262X	Paper Mills.
3*	263X	Paperboard Mills.
4	265X	Paperboard Containers and Boxes.
5	267X	Converted Paper and Paperboard Products, Except Containers and Boxes.
Sector C. Chemical and Allied Products Manufacturing.		
1*	281X	Industrial Inorganic Chemicals.
2*	282X	Plastics Materials and Synthetic Resins, Synthetic Rubber, Cellulosic and Other Manmade Fibers Except Glass.
3	283X	Drugs.
4*	284X	Soaps, Detergents, and Cleaning Preparations; Perfumes, Cosmetics, and Other Toilet Preparations.
5	285X	Paints, Varnishes, Lacquers, Enamels, and Allied Products.
6	286X	Industrial Organic Chemicals.
7*	287X	Agricultural Chemicals.
8	289X	Miscellaneous Chemical Products.
Sector D. Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers		
1*	295X	Asphalt Paving and Roofing Materials.
2	299X	Miscellaneous Products of Petroleum and Coal.
Sector E. Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing		
1	321X	Flat Glass.
	322X	Glass and Glassware, Pressed or Blown.
	323X	Glass Products Made of Purchased Glass.
2	324X	Hydraulic Cement.
3*	325X	Structural Clay Products.
	326X	Pottery and Related Products.
	3297	Non-Clay Refractories.
4*	327X	Concrete, Gypsum and Plaster Products.
	3295	Minerals and Earth's, Ground, or Otherwise Treated.
Sector F. Primary Metals		
1*	331X	Steel Works, Blast Furnaces, and Rolling and Finishing Mills.
2*	332X	Iron and Steel Foundries.
3	333X	Primary Smelting and Refining of Nonferrous Metals.
4	334X	Secondary Smelting and Refining of Nonferrous Metals.
5*	335X	Rolling, Drawing, and Extruding of Nonferrous Metals.
6*	336X	Nonferrous Foundries (Castings).
7	339X	Miscellaneous Primary Metal Products.
Sector G. Metal Mining (Ore Mining and Dressing)		
1	101X	Iron Ores.
2*	102X	Copper Ores.
3	103X	Lead and Zinc Ores.
4	104X	Gold and Silver Ores.
5	106X	Ferroalloy Ores, Except Vanadium.
6	108X	Metal Mining Services.
7	109X	Miscellaneous Metal Ores.
Sector H. Coal Mines and Coal Mining-Related Facilities		
NA*	12XX	Coal Mines and Coal Mining-Related Facilities.

TABLE 4.—SECTOR/SUBSECTOR DIVISION OF GROUP APPLICANTS FOR ANALYSES OF SAMPLING DATA—Continued

Subsector	SIC code	Activity represented
Sector I. Oil and Gas Extraction		
1*	131X	Crude Petroleum and Natural Gas.
2	132X	Natural Gas Liquids.
3*	138X	Oil and Gas Field Services.
Sector J. Mineral Mining and Dressing		
1*	141X	Dimension Stone.
	142X	Crushed and Broken Stone, Including Rip Rap.
	148X	Nonmetallic Minerals, Except Fuels.
2*	144X	Sand and Gravel.
3	145X	Clay, Ceramic, and Refractory Materials.
4	147X	Chemical and Fertilizer Mineral Mining.
Sector K. Hazardous Waste Treatment Storage or Disposal Facilities		
NA*	NA	Hazardous Waste Treatment Storage or Disposal.
Sector L. Landfills and Land Application Sites		
NA*	NA	Landfills and Land Application Sites.
Sector M. Automobile Salvage Yards		
NA*	5015	Automobile Salvage Yards.
Sector N. Scrap Recycling Facilities		
NA*	5093	Scrap Recycling Facilities.
Sector O. Steam Electric Generating Facilities		
NA*	NA	Steam Electric Generating Facilities.
Sector P. Land Transportation		
1	40XX	Railroad Transportation.
2	41XX	Local and Highway Passenger Transportation.
3	42XX	Motor Freight Transportation and Warehousing.
4	43XX	United States Postal Service.
5	5171	Petroleum Bulk Stations and Terminals.
Sector Q. Water Transportation		
NA*	44XX	Water Transportation.
Sector R. Ship and Boat Building or Repairing Yards		
NA	373X	Ship and Boat Building or Repairing Yards.
Sector S. Air Transportation Facilities		
NA*	45XX	Air Transportation Facilities.
Sector T. Treatment Works		
NA*	NA	Treatment Works.
Sector U. Food and Kindred Products		
1	201X	Meat Products.
2	202X	Dairy Products.
3	203X	Canned, Frozen and Preserved Fruits, Vegetables and Food Specialties.
4*	204X	Grain Mill Products.

TABLE 4.—SECTOR/SUBSECTOR DIVISION OF GROUP APPLICANTS FOR ANALYSES OF SAMPLING DATA—Continued

Subsector	SIC code	Activity represented
5	205X	Bakery Products.
6	206X	Sugar and Confectionery Products.
7*	207X	Fats and Oils.
8	208X	Beverages.
9	209X	Miscellaneous Food Preparations and Kindred Products.
Sector V. Textile Mills, Apparel, and Other Fabric Product Manufacturing		
1	22XX	Textile Mill Products.
2	23XX	Apparel and Other Finished Products Made From Fabrics and Similar Materials.
Sector W. Furniture and Fixtures		
NA	25XX	Furniture and Fixtures.
	2434	Wood Kitchen Cabinets.
Sector X. Printing and Publishing		
NA	27XX	Printing and Publishing.
Sector Y. Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries		
1*	301X	Tires and Inner Tubes.
	302X	Rubber and Plastics Footwear.
	305X	Gaskets, Packing, and Sealing Devices and Rubber and Plastics Hose and Belting.
	306X	Fabricated Rubber Products, Not Elsewhere Classified.
2	308X	Miscellaneous Plastics Products.
	393X	Musical Instruments.
	394X	Dolls, Toys, Games and Sporting and Athletic Goods.
	395X	Pens, Pencils, and Other Artists' Materials.
	396X	Costume Jewelry, Costume Novelties, Buttons, and Miscellaneous Notions, Except Precious Metal.
	399X	Miscellaneous Manufacturing Industries.
Sector Z. Leather Tanning and Finishing		
NA	311X	Leather Tanning and Finishing.
Sector AA. Fabricated Metal Products		
1*	342X	Cutlery, Handtools, and General Hardware.
	344X	Fabricated Structural Metal Products.
	345X	Screw Machine Products, and Bolts, Nuts, Screws, Rivets, and Washer.
	346X	Metal Forgings and Stampings.
	3471	Electroplating, Plating, Polishing, Anodizing, and Coloring.
	349X	Miscellaneous Fabricated Metal Products.
	391X	Jewelry, Silverware, and Plated Ware.
2*	3479	Coating, Engraving, and Allied Services.
Sector AB. Transportation Equipment, Industrial or Commercial Machinery		
NA	35XX	Industrial and Commercial Machinery.
Sector AC. Electronic, Electrical, Photographic and Optical Goods		
NA	36XX	Electronic, Electrical.
	38XX	Measuring, Analyzing and Controlling Instrument; Photographic and Optical Goods.

* Denotes subsector with analytical (chemical) monitoring requirements.
NA indicated those industry sectors in which subdivision into subsectors was determined to be not applicable.

To conduct a comparison of the results of the statistical analyses to determine when analytical monitoring would be required, EPA established "benchmark" concentrations for the pollutant parameters on which monitoring results had been received. The "benchmarks" are the pollutant concentrations above which EPA determined represents a level of concern. The level of concern is a concentration at which a storm water discharge could potentially impair, or contribute to impairing water quality or affect human health from ingestion of

water or fish. The benchmarks are also viewed by EPA as a level, that if below, a facility represents little potential for water quality concern. As such, the benchmarks also provide an appropriate level to determine whether a facility's storm water pollution prevention measures are successfully implemented. The benchmark concentrations are not effluent limitations and should not be interpreted or adopted as such. These values are merely levels which EPA has used to determine if a storm water discharge from any given facility merits further monitoring to insure that the facility has been successful in implementing a storm water pollution prevention plan. As such these levels represent a target concentration for a facility to achieve through implementation of pollution prevention measures at the facility. Table 5 lists the parameter benchmark values.

As can be seen in Table 5, benchmark concentrations were determined based upon a number of existing standards or other sources to represent a level above which water quality concerns could arise. EPA has also sought to develop values which can realistically be measured and achieved by industrial facilities. Moreover, storm water discharges with pollutant concentrations occurring below these levels would not warrant further analytical monitoring due to their de minimis potential effect on water quality.

The primary source of benchmark concentrations is EPA's National Water Quality Criteria, published in 1986 (often referred to as the "Gold Book"). For the majority of the benchmarks, EPA chose to use the acute aquatic life, fresh water ambient water quality criteria. These criteria represent maximum concentration values for a pollutant, above which, could cause acute effects on aquatic life such as mortality in a short period of time. Where acute criteria values were not available, EPA used the lowest observed effect level (LOEL) acute fresh water value. The LOEL values represent the lowest concentration of a pollutant that results in an adverse effect over a short period of time. These two acute freshwater values were selected as benchmark concentrations if the value was not below the approved method detection limit as listed in 40 CFR Part 136 and the value was not substantially above the concentration which EPA believes a facility can attain through the implementation of a storm water pollution prevention plan. These acute freshwater values best represent, on a national basis, the highest concentrations at which typical fresh water species can survive exposures of pollutants for short durations (i.e., a storm discharge event).

Acute freshwater criteria do not exist for a number of parameters on which EPA received data. For these parameters, EPA selected benchmark values from several other references. The benchmark concentrations for five day biochemical oxygen demand (BOD_5) and for pH are determined based upon the secondary wastewater treatment regulations (40 CFR 133.102). EPA believes that the BOD_5 value of 30 mg/L is a reasonable concentration below which adverse effects in receiving waters under wet weather flow conditions should not occur. EPA also believes, that given group application data on BOD_5, this value should be readily achievable by industrial storm water dischargers. The benchmark value for pH is a range of 6.0–9.0 standard units. EPA believes this level, given the group application data, is reasonably achievable by industrial storm water dischargers and represents and acceptable range within which aquatic life impacts will not occur. The benchmark concentration for chemical oxygen demand (COD) is based upon the State of North Carolina benchmark values for storm water discharges, and is a factor of four times the BOD_5 benchmark concentration. EPA has concluded that COD is generally discharged in domestic wastewater at four times the concentration of BOD_5 without causing adverse impacts on aquatic life. EPA selected the median concentration from the National Urban Runoff Program as the benchmark for total suspended solids (TSS) and for nitrate plus nitrite as nitrogen. EPA believes the median concentration, which is the mid-point concentration (half the samples are above this level and half are below) represents concentration above which water quality concerns may result. For TSS a value of 100mg/L is similar to the storm water benchmark used by North Carolina for storm water permits, and given the group application data, should be readily achievable by industry with implementation of BMPs, many of which are designed for the purpose of controlling TSS. EPA also believes, given the group application data, that there is a relationship between TSS and the amount of exposed industrial activity and that industrial activities even in arid western States should be able to implement BMPs that will accomplish this benchmark. EPA selected the storm water effluent limitation guideline for petroleum refining facilities as the benchmark for oil and grease. Given the lack of an acute criteria, EPA selected the chronic fresh water quality criteria as the benchmark for iron. Water quality criteria for waterbodies in the State of North Carolina were used to determine benchmarks for total phosphorus and for fluoride. The concentration value for phosphorus was designed to prevent eutrophication of fresh waterbodies from storm water runoff. The fluoride value was designed by North Carolina to be protective of water quality, as was the manganese value developed by Colorado. EPA believes that each of these benchmark values represent a reasonable level below which water quality impacts should not occur and they therefore represent a useful level to assess whether a pollution prevention plan is controlling pollution in storm water discharges.

For several other parameters, EPA chose a benchmark value base on a numerical adjustment of the acute fresh water quality criteria. Where the acute water quality criteria was below the method detection level for a pollutant, EPA used the "minimum level" (ML) as the benchmark concentration to ensure that the benchmark levels could be measured by permittees. For a few pollutants minimum levels have been published and these were used. For other pollutants, minimum levels need to be calculated. EPA calculated the minimum levels using the methodology described in the draft "National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations Set Below Analytical Detection/Quantitation Levels" (Michael Cook, OWEC, March 18, 1994).

Additionally, several organic compounds (ethylbenzene, fluoranthene, toluene, and trichloroethylene) have acute fresh water quality criteria at substantially high concentrations, much higher than criteria developed for the protection of human health when ingesting water or fish. In addition, trichloroethylene is a human carcinogen. Therefore, EPA selected the human health criteria as benchmarks for these parameters. For dimethyl phthalate and total phenols, EPA selected benchmark concentrations based upon existing discharge limitations and compliance data (no industry had median concentrations above the selected benchmark for these parameters and therefore no industry sector is required to monitor for these two pollutants).

EPA conducted statistical analyses of the group Part 2 data for each parameter within every industry sector or subsector listed in Table 5. The

pollutants, benchmark values, and source of the benchmark values are indicated below in Table 5.

TABLE 5.—PARAMETER BENCHMARK VALUES

Parameter name	Benchmark level	Source
Biochemical Oxygen Demand(5)	30 mg/L	4
Chemical Oxygen Demand	120 mg/L	5
Total Suspended Solids	100 mg/L	7
Oil and Grease	15 mg/L	8
Nitrate + Nitrite Nitrogen	0.68 mg/L	7
Total Phosphorus	2.0 mg/L	6
pH	6.0–9.0 s.u.	4
Acrylonitrile (c)	7.55 mg/L	2
Aluminum, Total (pH 6.5–9)	0.75 mg/L	1
Ammonia	19 mg/L	1
Antimony, Total	0.636 mg/L	9
Arsenic, Total (c)	0.16854 mg/L	9
Benzene	0.01 mg/L	10
Beryllium, Total (c)	0.13 mg/L	2
Butylbenzyl Phthalate	3 mg/L	3
Cadmium, Total (H)	0.0159 mg/L	9
Chloride	860 mg/L	1
Copper, Total (H)	0.0636 mg/L	9
Dimethyl Phthalate	1.0 mg/L	11
Ethylbenzene	3.1 mg/L	3
Fluoranthene	0.042 mg/L	3
Fluoride	1.8 mg/L	6
Iron, Total	1.0 mg/L	12
Lead, Total (H)	0.0816 mg/L	1
Manganese	1.0 mg/L	13
Mercury, Total	10.0024 mg/L	1
Nickel, Total (H)	1.417 mg/L	1
PCB–1016 (c)	0.000127 mg/L	9
PCB–1221 (c)	0.10 mg/L	10
PCB–1232 (c)	0.000318 mg/L	9
PCB–1242 (c)	0.00020 mg/L	10
PCB–1248 (c)	0.002544 mg/L	9
PCB–1254 (c)	0.10 mg/L	10
PCB–1260 (c)	0.000477 mg/L	9
Phenols, Total	1.0 mg/L	11
Pyrene (PAH,c)	0.01 mg/L	10
Selenium, Total (*)	0.2385 mg/L	9
Silver, Total (H)	0.0318 mg/L	9
Toluene	10.0 mg/L	3
Trichloroethylene (c)	0.0027 mg/L	3
Zinc, Total (H)	0.065 mg/L	1

Sources:
1. "EPA Recommended Ambient Water Quality Criteria." Acute Aquatic Life Freshwater.
2. "EPA Recommended Ambient Water Quality Criteria." LOEL Acute Freshwater.
3. "EPA Recommended Ambient Water Quality Criteria." Human Health Criteria for Consumption of Water and Organisms.
4. Secondary Treatment Regulations (40 CFR 133).
5. Factor of 4 times BOD5 concentration—North Carolina benchmark.
6. North Carolina storm water benchmark derived from NC Water Quality Standards.
7. National Urban Runoff Program (NURP) median concentration.
8. Median concentration of Storm Water Effluent Limitation Guideline (40 CFR Part 419).
9. Minimum Level (ML) based upon highest Method Detection Limit (MDL) times a factor of 3.18.
10. Laboratory derived Minimum Level (ML).
11. Discharge limitations and compliance data.
12. "EPA Recommended Ambient Water Quality Criteria." Chronic Aquatic Life Freshwater.
13. Colorado—Chronic Aquatic Life Freshwater—Water Quality Criteria.

Notes:
(*) Limit established for oil and gas exploration and production facilities only.
(c) carcinogen.
(H) hardness dependent.
(PAH) Polynuclear Aromatic Hydrocarbon.

Assumptions:
Receiving water temperature—20 C.
Receiving water pH—7.8.
Receiving water hardness CaCO3 100 mg/L.
Receiving water salinity 20 g/kg.
Acute to Chronic Ratio (ACR)—10.

EPA prepared a statistical analysis of the sampling data for each pollutant parameter reported within each sector or subsector. (Only where EPA did not subdivide an industry sector into subsectors was an analysis of the entire

sector's data performed.) The statistical analysis was performed assuming a delta log normal distribution of the sampling data within each sector/subsector. The analyses calculated median, mean, maximum, minimum, 95th, and 99th percentile concentrations for each parameter. The results of the analyses may be found in the appropriate section of Part VIII of this Fact Sheet. From this analysis, EPA was able to identify pollutants for further evaluation within each sector or subsector.

EPA next compared the median concentration for each pollutant for each sector or subsector to the benchmark concentrations listed in Table 5. EPA also compared the other statistical results to the benchmarks to better ascertain the magnitude and range of the discharge concentrations to help identify the pollutants of concern. EPA did not conduct this analysis if a sector had data for a pollutant from less than three individual facilities. Under these circumstances, the sector or subsector would not have this pollutant identified as a pollutant of concern. This was done to ensure that a reasonable number of facilities represented the industry sector or subsector as a whole and that the analysis did not rely on data from only one facility.

For each industry sector or subsector, parameters with a median concentration higher than the benchmark level were considered pollutants of concern for the industry and identified as potential pollutants for analytical monitoring under today's permit. EPA then analyzed the list of potential pollutants to be monitored against the lists of significant materials exposed and industrial activities which occur within each industry sector or subsector as described in the part I application information. Where EPA could identify a source of a potential pollutant which is directly related to industrial activities of the industry sector or subsector, the permit identifies that parameter for analytical monitoring. If EPA could not identify a source of a potential pollutant which was associated with the sector/subsector's industrial activity, the permit does not require monitoring for the pollutant in that sector/subsector. Industries with no pollutants for which the median concentrations are higher than the benchmark levels are not required to perform analytical monitoring under this permit, with the exceptions explained below.

In addition to the sectors and subsectors identified for analytical monitoring using the methods described above, EPA determined, based upon a review of the degree of exposure, types of materials exposed, special studies and in some cases inadequate sampling data in the group applications, that industries in the following sections of today's fact sheet also warrant analytical monitoring not withstanding the absence of data on the presence or absence of certain pollutants in the group applications: VIII.K.7 (hazardous waste treatment storage and disposal facilities), and VIII.S.6 (airports which use more than 100,000 gallons per year of glycol-based fluids or 100 tons of urea for deicing). These industries are required to perform analytical monitoring under the permit due to the high potential for contamination of storm water discharge, which EPA believes was not adequately characterized by group applicants in the information they provided in the group application process.

All facilities within an industry sector or subsector identified for analytical monitoring must, at a minimum, monitor their storm water discharges during the second year of permit coverage, unless the facility exercises the Alternative Certification described in Section VI.E.3 of this fact sheet. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter for which the facility is required to monitor. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed. Monitoring must be conducted for the same storm water discharge outfall in each sampling period. Where a given storm water discharge is addressed by more than one sector/subsector's monitoring requirements, then the monitoring requirements for the applicable sector's/subsector's activities are cumulative. Therefore, if a particular discharge fits under more than one set of monitoring requirements, the facility must comply with all sets of sampling requirements. Monitoring requirements must be evaluated on an outfall-by-outfall basis.

If the average concentration for a pollutant parameter is less than or equal to the benchmark value, then the permittee is not required to conduct analytical monitoring for that pollutant during the fourth year of the permit. If, however, the average concentration for a pollutant is greater than the benchmark value, then the permittee is required to conduct quarterly monitoring for that pollutant during the fourth year of permit coverage. Analytical monitoring is not required during the first, third, and fifth year of the permit. The exclusion from analytical monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit.

2. Compliance Monitoring

In addition to the analytical monitoring requirements for certain sectors, today's permit contains monitoring requirements for discharges which are subject to effluent limitations. These discharges must be sampled annually and tested for the parameters which are limited by the permit. Discharges subject to compliance monitoring include: coal pile runoff, contaminated runoff from phosphate fertilizer manufacturing facilities, runoff from asphalt paving and roofing emulsion production areas, material storage pile runoff from cement manufacturing facilities, and mine dewatering discharges from crushed stone, construction sand and gravel, and industrial sand mines located in Texas, Louisiana, Oklahoma, New Mexico, and Arizona. All samples are to be grabs taken within the first 30 minutes of discharge where practicable, but in no case later than the first hour of discharge. Where practicable, the samples shall be taken from the discharges subject to the numeric effluent limitations prior to mixing with other discharges.

Monitoring for these discharges is required to determine compliance with numeric effluent limitations. Furthermore, discharges covered under today's permit which are subject to numeric effluent limitations are not eligible for the alternative certification in Part VI.E.3. of this fact sheet.

3. Alternate Certification

Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is included in the permit to ensure that monitoring requirements are only imposed on those facilities which do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if there are no sources of a pollutant exposed to storm water at the site then the potential for that pollutant to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the analytical monitoring

requirements provided the discharger makes a certification for a given outfall, on a pollutant-by-pollutant basis, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to EPA in lieu of monitoring reports required under Part XI of the permit. The permittee is required to complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the date exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained. This certification is not to be confused with the low concentration sampling waiver. The test for the application of this certification is whether the pollutant is exposed, or can be expected to be present in the storm water discharge. If the facility does not and has not used a parameter, or if exposure is eliminated and no significant materials remain, then the facility can exercise this certification.

The permit does not allow facilities with discharges subject to numeric effluent limitations to submit alternative certification in lieu of the compliance monitoring requirements in Sections VI.C., XI.C.6., XI.D.5., XI.E.5., and XI.J.5. The permit also does not allow air transportation facilities subject to the analytical monitoring requirements under Section XI.S.5. to exercise an alternative certification.

A facility is not precluded from exercising the alternative certification in lieu of analytical monitoring requirements in the fourth year of permit coverage, even if that facility failed to qualify for a low concentration waiver in year two. EPA encourages facilities to eliminate exposure of industrial activities and significant materials where practicable.

4. Reporting and Retention Requirements

Permittees are required to submit all analytical monitoring results obtained during the second and fourth year of permit coverage within three months of the conclusion of the second and fourth year of coverage of the permit. For each outfall, one Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled. Permittees subject to compliance monitoring requirements are required to submit all compliance monitoring results annually on the 28th day of the month following the anniversary of the publication of this permit. Compliance monitoring results must be submitted on signed Discharge Monitoring Report Forms. For each outfall, one Discharge Monitoring Report form must be submitted for each storm event sampled.

Permittees are not required to submit records of the visual examinations of storm water discharges unless specifically asked to do so by the Director. Records of the visual examinations must be maintained at the facility. Records of visual examination of storm water discharge need not be lengthy. Permittees may prepare typed or hand written reports using forms or tables which they may develop for their facility. The report need only document: the date and time of the examination; the name of the individual making the examination; and any observations of color, odor, clarity, floating solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution.

The location for submittal of all reports is contained in the permit. Consistent with Office of Management and Budget Circular A–105, facilities located on the following Federal Indian Reservations, which cross EPA Regional boundaries, should note that permitting authority for such lands is consolidated in one single EPA Region.

a. Duck Valley Reservations lands, located in Regions IX and X, are handled by Region IX.

b. Fort McDermitt Reservation lands, located in Regions IX and X, are handled by Region IX.

c. Goshute Reservation lands, located in Regions VIII and IX, are handled by Region IX.

d. Navajo Reservation lands, located in Regions VI, VIII, and IX, are handled by Region IX.

e. Ute Mountain Reservation lands, located in Regions VI and VIII, are handled Region VIII (no areas in Region VIII are receiving coverage under this permit).

Pursuant to the requirements of 40 CFR 122.41(j), today's permit requires permittees to retain all records for a minimum of 3 years from the date of the sampling, examination, or other activity that generated the data.

5. Sample Type

The discussion below is a general description of the sample type required for monitoring under today's permit. Certain industries have different requirements, however, so permittees should check the industry-specific requirements in Part XI. of today's permit to confirm these requirements. Grab samples may be used for all monitoring unless otherwise stated. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval may be waived by the permittee where the preceding measurable storm event did not result in a measurable discharge from the facility. The 72-hour requirement may also be waived by the permittee where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample must be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger must submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. A minimum of one grab is required. Where the discharge to be sampled contains both storm water and non-storm water, the facility shall sample the storm water component of the discharge at a point upstream of the location where the non-storm water mixes with the storm water, if practicable.

6. Representative Discharge

The permit allows permittees to use the substantially identical outfalls to reduce their monitoring burden. This representative discharge provision provides facilities with multiple storm water outfalls, a means for reducing the number of outfalls that must be sampled and analyzed. This may result in a substantial reduction of the resources required for a facility to comply with analytical monitoring requirements. When a facility has two or more outfalls

that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explaining in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g., low (under 40 percent), medium (40 to 65 percent) or high (above 65 percent)) shall be provided in the plan. Facilities that select and sample a representative discharge are prohibited from changing the selected discharge in future monitoring periods unless the selected discharge ceases to be representative or is eliminated. Permittees do not need EPA approval to claim discharges are representative, provided they have documented their rationale within the storm water pollution prevention plan. However, the Director may determine the discharges are not representative and require sampling of all non-identical outfalls.

The representative discharge provision in the permit is available to almost all facilities subject to the analytical monitoring requirements (not including compliance monitoring for effluent guideline limit compliance purposes) and to facilities subject to visual examination requirements.

The representative discharge provisions described above are consistent with Section 5.2 of NPDES Storm Water Sampling Guidance Document (EPA 833–B–92–001, July 1992).

7. Sampling Waiver

a. Adverse Weather Conditions. The permit allows for temporary waivers from sampling based on adverse climatic conditions. This temporary sampling waiver is only intended to apply to insurmountable weather conditions such as drought or dangerous conditions such as lightning, flash flooding, or hurricanes. These events tend to be isolated incidents and should not be used as an excuse for not conducting sampling under more favorable conditions associated with other storm events. The sampling waiver is not intended to apply to difficult logistical conditions, such as remote facilities with few employees or discharge locations which are difficult to access. When a discharger is unable to collect samples within a specified sampling period due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate qualifying event in the next sampling period as well as a sample for the routine monitoring required in that period. Both samples should be analyzed separately and the results of that analysis submitted to EPA. Permittees are not required to obtain advance approval for sampling waivers.

b. Unstaffed and Inactive Sites—Chemical Waiver. The permit allows for a waiver from sampling for facilities that are both inactive and unstaffed. This waiver is only intended to apply to these types of facilities when the ability to conduct sampling would be severely hindered and result in the inability to meet the time and representative rainfall sampling specifications. This sampling waiver is not intended to apply to remote facilities that are active and staffed, or typical difficult logistical conditions. When a discharger is unable to collect samples as specified in this permit, the discharger shall certify to the Director in the DMR that the facility is unstaffed and inactive and the ability to conduct samples within the specifications is not possible. Permittees are not required to obtain advance approval for this waiver.

c. Unstaffed and Inactive Sites—Visual Waiver. The permit allows for a waiver from sampling for facilities that are both inactive and unstaffed. This waiver is only intended to apply to these types of facilities when the ability to conduct visual examinations would be severely hindered and result in the inability to meet the time and representative rainfall sampling specifications. This sampling waiver is not intended to apply to remote facilities that are active and staffed, or typical difficult logistical conditions. When a discharger is unable to perform visual examinations as specified in this permit, the discharger shall maintain on site with the pollution prevention plan a certification stating that the facility is unstaffed and inactive and the ability to perform visual examinations within the specifications is not possible. Permittees are not required to obtain advance approval for visual examination waivers.

8. Quarterly Visual Examination of Storm Water Quality

In order to provide a tool for evaluating the effectiveness of the pollution prevention plan, the permit requires the majority of industries covered under today's permit to perform quarterly visual examinations of storm water discharges. EPA believes these visual examinations will assist with the evaluation of the pollution prevention plan. This section provides a general description of the monitoring and reporting requirements under today's permit. The visual examination provides a simple, low cost means of assessing the quality of storm water discharge with immediate feedback. Most facilities covered under today's permit are required to conduct a quarterly visual examination of storm water discharges associated with industrial activity from each outfall, except discharges exempted under the representative discharge provision. The visual examination of storm water outfalls should include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. No analytical tests are required to be performed on these samples.

The examination of the sample must be made in well lit areas. The visual examination is not required if there is insufficient rainfall or snow-melt to runoff or if hazardous conditions prevent sampling. Whenever practicable the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible in recording observations. Grab samples for the examination shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained on site with the pollution prevention plan.

When conducting a storm water visual examination, the pollution prevention team, or team member, should attempt to relate the results of the examination to potential sources of storm water contamination on the site. For example, if the visual examination reveals an oil sheen, the facility personnel (preferably members of the pollution prevention team) should conduct an inspection of the area of the site draining to the examined discharge to look for obvious sources of spilled oil, leaks, etc. If a source can be located, then this information allows the facility

operator to immediately conduct a clean-up of the pollutant source, and/or to design a change to the pollution prevention plan to eliminate or minimize the contaminant source from occurring in the future.

To be most effective, the personnel conducting the visual examination should be fully knowledgeable about the storm water pollution prevention plan, the sources of contaminants on the site, the industrial activities conducted exposed to storm water and the day to day operations that may cause unexpected pollutant releases.

Other examples include; if the visual examination results in an observation of floating solids, the personnel should carefully examine the solids to see if they are raw materials, waste materials or other known products stored or used at the site. If an unusual color or odor is sensed, the personnel should attempt to compare the color or odor to the colors or odors of known chemicals and other materials used at the facility. If the examination reveals a large amount of settled solids, the personnel may check for unpaved, unstabilized areas or areas of erosion. If the examination results in a cloudy sample that is very slow to settle-out, the personnel should evaluate the site draining to the discharge point for fine particulate material, such as dust, ash, or other pulverized, ground, or powdered chemicals.

If the visual examination results in a clean and clear sample of the storm water discharge, this may indicate that no visible pollutants are present. This would be a indication of a high quality result, however, the visual examination will not provide information about dissolved contamination. If the facility is in a sector or subsector required to conduct analytical (chemical) monitoring, the results of the chemical monitoring, if conducted on the same sample, would help to identify the presence of any dissolved pollutants and the ultimate effectiveness of the pollution prevention plan. If the facility is not required to conduct analytical monitoring, it may do so if it chooses to confirm the cleanliness of the sample.

While conducting the visual examinations, personnel should constantly be attempting to relate any contamination that is observed in the samples to the sources of pollutants on site. When contamination is observed, the personnel should be evaluating whether or not additional BMPs should be implemented in the pollution prevention plan to address the observed contaminant, and if BMPs have already been implemented, evaluating whether or not these are working correctly or need maintenance. Permittees may also conduct more frequent visual examinations than the minimum quarterly requirement, if they so choose. By doing so, they may improve their ability to ascertain the effectiveness of their plan. Using this guidance, and employing a strong knowledge of the facility operations, EPA believes that permittees should be able to maximize the effectiveness of their storm water pollution prevention efforts through conducting visual examinations which give direct, frequent feedback to the facility operator or pollution prevention team on the quality of the storm water discharge.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. EPA recommends that the visual examination be conducted at different times than the chemical monitoring, but is not requiring this. In addition, more frequent visual examinations can be conducted if the permittee so chooses. In this way, better assessments of the effectiveness of the pollution prevention plan can be achieved. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the site's storm water problems and the effects of the management practices that are included in the plan.

9. SARA Title III, Section 313 Facilities

Today's permit does not contain special monitoring requirements for facilities subject to the Toxic Release Inventory (TRI) reporting requirements under Section 313 of the EPCRA. EPA has reviewed data submitted by facilities in the group application and determined that storm water monitoring requirements are more appropriately based upon the industrial activity or significant material exposed than upon a facility's status as a TRI reporter under Section 313 of EPCRA. This determination is based upon a comparison of the data submitted by TRI facilities included in the group application process to data from group application sampling facilities that were not found on the TRI list. Table 6 summarizes the data comparison. The data indicate that there are no consistent differences in the level of water priority chemicals present in samples from TRI facilities when compared to the samples from facilities not subject to TRI reporting requirements.

EPA has included a revised Appendix A that lists 44 additional water priority chemicals that meet the definition of a section 313 water priority chemical or chemical categories requirements as defined by EPA in the permit under Part X, Definitions.

TABLE 6.—COMPARISON OF POLLUTANT CONCENTRATION IN GRAB SAMPLES

Pollutant	Non-TRI facility median concentration (mg/L)	TRI facility median concentration (mg/L)	Non-TRI facility mean concentration (mg/L)	TRI facility mean concentration (mg/L)	Non-TRI facility 95th percentile concentration (mg/L)	TRI facility 95th percentile concentration (mg/L)
Acrylonitrile	0.100	0.000	0.085	0.000	0.100	0.000
Aluminum	0.922	0.819	12.061	28.893	58.000	12.000
Ammonia	0.640	0.000	10.507	23.231	9.500	17.200
Antimony	0.000	0.000	0.603	0.014	2.096	0.078
Arsenic	0.000	0.000	0.231	0.008	0.170	0.033
Benzene	0.000	0.000	0.001	0.000	0.001	0.000
Beryllium	0.001	0.000	0.002	0.080	0.007	0.400
Butylbenzyl phthalate	0.000	0.000	0.007	0.000	0.018	0.000
Cadmium	0.000	0.000	0.014	0.030	0.050	0.028
Chlorine	0.000	0.000	1.590	0.052	11.000	0.300

TABLE 6.—COMPARISON OF POLLUTANT CONCENTRATION IN GRAB SAMPLES—Continued

Pollutant	Non-TRI facility median concentration (mg/L)	TRI facility median concentration (mg/L)	Non-TRI facility mean concentration (mg/L)	TRI facility mean concentration (mg/L)	Non-TRI facility 95th percentile concentration (mg/L)	TRI facility 95th percentile concentration (mg/L)
Chloroform	0.000	0.000	0.083	0.001	0.022	0.006
Chromium	0.006	0.000	1.236	0.109	0.250	0.270
Copper	0.047	0.028	1.430	0.344	2.200	1.300
Cyanide	0.000	0.000	0.021	0.007	0.008	0.020
Di-n-butyl phthalate	0.000	0.000	0.005	0.168	0.014	1.595
Dimethyl phthalate	0.000	0.000	0.005	0.000	0.016	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.001	0.005
Hexavalent chromium	0.000	0.000	0.001	0.003	0.002	0.011
Lead	0.020	0.006	0.556	0.480	1.900	1.100
Manganese	0.150	0.090	2.015	0.273	9.550	1.244
Mercury	0.000	0.000	0.530	0.006	0.001	0.005
Naphthalene	0.000	0.000	2.998	0.001	24.000	0.013
Nickel	0.020	0.000	0.087	0.311	0.390	0.458
Phenols	0.000	0.000	0.063	0.019	0.100	0.075
Selenium	0.000	0.000	0.262	0.000	0.020	0.001
Silver	0.000	0.000	0.034	0.001	0.006	0.010
Toluene	0.000	0.000	0.052	0.011	0.037	0.009
Trichloroethylene	0.000	0.000	0.004	0.040	0.001	0.030
1,1,1-Trichloroethane	0.000	0.000	0.004	0.460	0.015	6.000
Xylene	0.000	0.000	0.000	0.004	0.003	0.037
Zinc	0.320	0.250	3.761	1.720	8.800	5.140

F. Numeric Effluent Limitations

1. Industry-specific Limitations

Part XI. of today's permit contains numeric effluent limitations for phosphate fertilizer manufacturing facilities, asphalt emulsion manufacturers, cement manufacturers, coal pile runoff from steam electric power generating facilities, and sand, gravel, and crushed stone quarries. These limitations are required under EPA's storm water effluent limitation guidelines in the Code of Federal Regulations at 40 CFR Part 418, Part 443, Part 411, Part 423, and Part 436. Parts VIII.C.6., VIII.D.5., VIII.E.6., and VIII.J.5. of this fact sheet discuss these limitations.

2. Coal Pile Runoff

Today's permit establishes effluent limitations of 50 mg/L total suspended solids and a pH range of 6.0–9.0 for coal pile runoff. Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff associated with a 10-year, 24-hour rainfall event is not subject to the 50 mg/L limitation for total suspended solids. Steam electric generating facilities must comply with these limitations upon submittal of the NOI. EPA has adopted these technology-based pH limitations in today's general permit in accordance with setting limits on a case-by-case basis as allowed under 40 CFR 125.3 and Section 402 of the Clean Water Act. These case-by-case limits are derived by transferring the known achievable technology from an effluent guideline to a similar type of discharge. When developing these technology-based limitations, variables such as rainfall pH, sizes of coal piles, pollutant characteristics, and runoff volume were considered. Therefore, these variables need not be considered again. As discussed above, these pH limitations are technology-based and are not based on water quality. All other types of facilities must comply with this requirement as expeditiously as practicable, but in no event later than 3 years from the date of permit issuance.

The pollutants in coal pile runoff can be classified into specific types according to chemical characteristics. Each type relates to the pH of the coal pile drainage. The pH tends to be of an acidic nature, primarily as a result of the oxidation of iron sulfide in the presence of oxygen and water. The potential influence of pH on the ability of toxic and heavy metals to leach from coal piles is of particular concern. Many of the metals are amphoteric with regard to their solubility behavior. These factors affect acidity, pH, and the subsequent leaching of trace metals: concentration and form of pyritic sulfur in coal; size of the coal pile; method of coal preparation and clearing prior to storage; climatic conditions, including rainfall and temperature; concentrations of calcium carbonate and other neutralizing substances in the coal; concentration and form of trace metals in the coal; and the residence time of water in the coal pile.

Coal piles can generate runoff with low pH values, with the acid values being quite variable. The suspended solids levels can be significant, with levels of 2,500 mg/L not uncommon. Metals present in the greatest concentrations are copper, iron, aluminum, nickel, and zinc. Others present in trace amounts include chromium, cadmium, mercury, arsenic, selenium, and beryllium [14].

G. Regional Offices

1. Notice of Intent Address

Notices of Intent to be authorized to discharge under this permit should be sent to: NOI/NOT Processing Center (4203), 401 M Street, S.W., Washington, DC 20460.

2. Address for Other Submittals

Other submittals of information required under this permit or individual permit applications should be sent to the appropriate EPA Regional Office:

a. ME, MA, NH, Federal Indian Reservations in CT, MA, NH, ME, RI, and Federal Facilities in VT

EPA, Region I, Water Management Division, (WCP), Storm Water Staff, JFK Federal Building, Boston, MA 02203

b. PR and Federal Facilities in PR

[14] A more complete description of pollutants in coal pile runoff is provided in the "Final Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category," (EPA–440/1–82/029), EPA, November 1982.

EPA, Region II, Water Management Division, (2WM-WPC), Storm Water Staff, 290 Broadway, New York, NY 10007–1866

c. DC and Federal Facilities in DC and DE

EPA, Region III, Water Management Division, (3WM55), Storm Water Staff, 841 Chestnut Building, Philadelphia, PA 19107

d. FL

EPA, Region IV, Water Management Division, Permits Section (WPEB–7), 345 Courtland Street, NE, Atlanta, GA 30365

e. LA, NM, OK, and TX and Federal Indian Reservations in LA, NM (Except Navajo and Ute Mountain Reservation Lands), OK, and TX

EPA, Region VI, Water Management Division, (6W–EA), EPA SW MSGP, P.O. Box 50625, Dallas, TX 75202

f. AZ, Johnston Atoll, Midway Island, Wake Island, all Federal Indian Reservations in AZ, CA, and NV; those portions of the Duck Valley, Fort McDermitt, and Goshute Reservations that are outside NV; those portions of the Navajo Reservation that are outside AZ; and Federal facilities in AZ, Johnston Atoll, Midway Island, and Wake Island.

EPA, Region IX, Water Management Division, (W–5–3), Storm Water Staff, 75 Hawthorne Street, San Francisco, CA 94105

g. ID, OR, and WA; Federal Indian Reservations in AK, ID (except the Duck Valley Reservation), OR (except the Fort McDermitt Reservation), and WA; and Federal facilities in ID, and WA

EPA, Region X, Water Division, (WD–134), Storm Water Staff, 1200 Sixth Avenue, Seattle, WA 98101

H. Compliance Deadlines

For most permittees, today's permit imposes a deadline of 270 days following date of publication of this permit for development of pollution prevention plans and for compliance with the terms of the plan.

Today's general permit provides additional time if constructing structural best management practices is called for in the plan. The portions of a plan addressing these BMP construction requirements must provide for compliance with the plan as soon as practicable, but in no case later than 3 years from the effective date of the permit. However, storm water pollution prevention plans for facilities subject to these additional requirements must be prepared within 270 days of the date of publication of this permit and provide for compliance with the baseline terms and conditions of the permit (other than the numeric effluent limitation) as expeditiously as practicable, but in no case later than 270 days after the publication date of this permit.

Facilities are not required to submit the pollution prevention plans for review unless they are requested by EPA or by the operator of a large or medium municipal separate storm sewer system. When a plan is reviewed by EPA, the Director can require the permittee to amend the plan if it does not meet the minimum permit requirements.

VII. Cost Estimates for Common Permit Requirements

The conditions of today's general permit reflects the baseline permit requirements established in EPA's NPDES permits for Storm Water Discharges Associated With Industrial Activity (57 FR 41175 and 57 FR 44412). The requirements found under today's permit are more specific to the conditions found in the industries. EPA does not consider these requirements to be more costly than the pollution prevention plan requirements established in the baseline general permit. The following section contains the estimates of the cost of compliance with the baseline permit requirements.

A. Pollution Prevention Plan Implementation

Storm water pollution prevention plans for the majority of facilities will include relatively low cost baseline controls. EPA's analysis of storm water pollution prevention plans indicates that the cost of developing and implementing these plans is variable and will depend on a number of the following factors: the size of the facility, the type and amount of significant materials stored or used at a facility, the nature of the plant operations, the plant designs (e.g., the processes used and layout of a plan), and the extent to which housekeeping measures are already employed. Table 7 provides estimates of the range of costs for preparing and implementing the common requirements for a storm water pollution prevention plan. It is expected that the low cost estimates provided in Table 7 are appropriate for the majority of smaller facilities. The high cost estimates in Table 7 are more applicable to larger, more complex facilities with more potential sources of pollutants. Please note that the costs in this table exclude special requirements, such as EPCRA 313 requirements. EPA estimated the cost of preparing a storm water pollution prevention plan for a hypothetical small business in the automobile salvage yard industry. Based on experience and best professional judgment, EPA estimates that a typical small automobile salvage yard would face a one-time cost of about $874. This cost is lower than the low end of the cost estimate provided in Table 7 because it is based on a particular (though hypothetical) small business. Table 7 estimates are based on what EPA expects are appropriate for the majority of small facilities. Some facilities are likely to face lower costs, such as the hypothetical small automobile junk yard, and other facilities are likely to face higher costs.

The cost of compliance, monitoring and preparing the PPP for the multi-sector permit are not high when compared to the site-specific requirements to comply with an individual permit. The Clean Water Act does not give EPA the authority to exempt permitted facilities from requirements designed to improve the quality of the nation's waters. The economic ability of small businesses to comply with this permit can be a factor to consider if water quality concerns are not applicable to the surface water body receiving the storm water discharge.

The operators of regulated storm water discharges have to consider the economic effects of coverage under the multi-sector permit, the baseline general permit, or an individual NPDES permit. Coverage under either of the two general permits is not required by EPA. The NPDES regulations give EPA the authority to require coverage under an individual NPDES permit, not general permits. A facility's decision to be covered under a general permit is voluntary. Individual permits can require numerical limits and more frequent monitoring and reporting, along with the development and implementation of SWPPPs. The burden of developing an SWPPP is controlled by the facility's ability to achieve the permits goal: reduce or eliminate the discharge of pollutants to the nation's waters.

TABLE 7.—SUMMARY OF ESTIMATED RANGES OF COSTS FOR COMPLIANCE WITH STORM WATER POLLUTION PREVENTION PLANS WITH BASELINE REQUIREMENTS

	Low costs		High costs	
	First year costs	Annual costs	First year costs	Annual costs
Submittal of NOI	$14	.....	$14	.....
Notification of Municipality	14	.....	14	.....
Plan Preparation	1,518	.....	76,153	.....
Plan Implementation	90	294	35,400	9,371
Comprehensive Site Compliance Evaluation/Plan Revision	.....	267	.....	8,875
Reportable Quantities	(1) No Costs	.....	8,501	.....
Total	1,636	561	120,082	18,246

This table identifies estimated low and high costs (in 1992 dollars) to develop and implement storm water pollution prevention plans.
Low costs of implementing program components are zero where existing programs or procedures is assumed adequate.
The estimated costs for plan preparation and plan revisions includes costs of preparing/revising plan to address baseline requirements. However, the costs of implementing special requirements, such as those for EPCRA Section 313 facilities coal piles and salt piles are not otherwise addressed in this table.

B. Cost Estimates for EPCRA Section 313

Table 8 provides estimates of the range of costs of preparing and implementing a storm water pollution prevention plan for facilities subject to the special requirements for facilities subject to EPCRA Section 313 reporting requirements for chemicals classified as "Section 313 water priority chemicals." EPA expects the majority of facilities to have existing containment systems that meet the majority of the requirements of this permit. High cost estimates correspond to facilities that are expected to be required to undertake some actions to upgrade existing containment systems to meet the requirements of this permit.

TABLE 8.—SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR COMPLIANCE WITH STORM WATER POLLUTION PREVENTION PLANS FOR FACILITIES SUBJECT TO SECTION 313 OF EPCRA FOR WATER PRIORITY CHEMICALS

	Low costs		High costs	
	Costs during first 3 years	Annual costs	Costs during first 3 years	Annual costs
Plan Preparation	$630	.....	0	.....
Liquid Storage Areas	.....	.....	$11,200	.....
Material Storage Areas	.....	.....	560	.....
Loading Areas	.....	.....	21,000	.....
Process Areas	.....	.....	11,190	.....
Drainage/Runoff	.....	.....	7,750	.....
Housekeeping/Maintenance	.....	.....	.....	$5,957
Facility Security	.....	.....	3,240	.....
Employee Training	.....	.....	.....	1,403
Toxicity Reduction	.....	.....	.....	3,046
Totals	630	$0	54,940	10,406

This table identifies estimated additional low and high costs to develop and implement storm water pollution prevention plans for EPCRA Section 313 facilities subject to special conditions.
Low costs of implementing program components are zero where existing programs, procedures or security is assumed adequate.
The high costs for preparing pollution prevention plans to include EPCRA Section 313 additional requirement were addressed as part of the estimated high costs for preparation of baseline pollution prevention plans (see Table 7).

C. Cost Estimates for Coal Piles

The effluent limitations for coal pile runoff in the permit can be achieved by these two primary methods: limiting exposure to coal by use of covers or tarpaulins and collecting and treating the runoff. In some cases, coal pile runoff may be in compliance with the effluent limitations without covering of the pile or collection or treatment of the runoff. In these cases, the operator of the discharge would not have a control cost.

The use of covers or tarpaulins to prevent or minimize exposure of the coal pile to storm water is generally expected to be practical only for relatively small piles. Coal pile covers or tarpaulins are anticipated to have a fixed cost of $400 and annual cost of $160.

Table 9 provides estimates of the costs of treating coal pile runoff.[15] These costs are based on a consideration of a treatment train requiring equalization, pH adjustment, and settling, including the costs for impoundment (for equalization), a lime feed system and mixing tanks for pH adjustment, and a clarifier for settling. The costs for the

[15] The type and degree of treatment required to meet the effluent limitations of this permit vary depending on factors such as the amount of sulfur in the coal. This section describes a model treatment scheme for estimating costs for compliance with the effluent limitations. Dischargers may implement other less expensive treatment approaches to enable them to discharge in accordance with these limits where appropriate.

impoundment area include diking and containment around each coal pile and associated sumps and pumps and piping from runoff areas to the impoundment area. The costs for land are not included. The lime feed system employed for pH adjustment includes a storage silo, shaker, feeder, and lime slurry storage tank, instrumentation, electrical connections, piping, and controls.

Additional costs may be incurred if a polymer system is needed. In this case, costs would include impoundment for equalization, a lime feed system, mixing tank, and polymer feed system for chemical precipitation, a clarifier for settling, and an acid feeder and mixing tank to readjust the pH within the range of 6 to 9. The equipment and system design, with the exception of the polymer feeder, acid feeder, and final mixing tank, are essentially the same as shown in Table 9. Two tanks are required for a treatment train with a polymer system, one for precipitation and another for final pH adjustment with acid. The cost of mixing is therefore twice that shown in Table 9. The polymer feed system includes storage hoppers, chemical feeder, solution tanks, solution pumps, interconnecting piping, electrical connections, and instrumentation. The costs of clarification are identical to that of Table 9. A treatment train with a polymer system requires the use of an acid addition system to readjust the pH within the range of 6 to 9. The components of this system include a lined acid storage tank, two feed pumps, an acid pH control loop, and associated piping, electrical connections, and instrumentation.

Additional information regarding the cost of these technologies can be found in "Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category," (EPA–440/182/029), November 1982, EPA.

TABLE 9.—SUMMARY OF ESTIMATED COSTS FOR TREATMENT OF COAL PILE RUNOFF

	30,000 cubic meter coal pile	120,000 cubic meter coal pile
IMPOUNDMENT:		
Installed Capital Cost	6,850	6,850
Operation and Maintenance ($/year)	Negligible	Negligible
LIME FEED SYSTEM:		
Installed Capital Cost ($)	138,800	255,700
Operation and Maintenance ($/year)	5,780	10,655
Energy Requirements (kwh/yr)	3.6x10**4	3.6x10**4
Land Requirements (ft**2)	5,000	5,000
MIXING EQUIPMENT:		
Installed Capital Cost ($)	65,750	91,320
Operation and Maintenance ($/year)	2,280	2,430
Energy Requirements (kwh/yr)	1.3x10**3	3.3x10**3
Land Requirements (ft**2)	2,000	2,000
CLARIFICATION:		
Installed Capital Cost ($)	182,650	237,450
Operation and Maintenance ($/year)	3,200	3,650
Energy Requirements (kwh/yr)	1.3x10**3	3.3x10**3
Land Requirements (acres)	0.1	0.1

Source: "Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category" (EPA–440/182/029), November 1982, EPA). Costs estimates are in 1992 dollars.

D. Cost Estimates for Salt Piles

Salt pile covers or tarpaulins are anticipated to have a fixed cost of $400 and an annual cost of $160 for medium-sized piles and a fixed cost of $4,000 and an annual cost of $2,000 for very large piles. Structures such as salt domes are generally expected to have a fixed cost of between $30,000 for small piles ($70 to $80 per cubic yard) and $100,000 for larger piles ($18 per cubic yard) with costs depending on size and other construction parameters.

VIII. Special Requirements for Discharges Associated With Specific Industrial Activities

The industry-specific requirements allow the implementation of site-specific measures that address features, activities, or priorities for control associated with the identified storm water discharges. This framework provides the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with the different types of industrial activity addressed by this permit. This approach also assures that facilities have the opportunity to identify procedures to prevent storm water pollution at a particular site that are appropriate, given processes employed, engineering aspects, functions, costs of controls, location, and age of the facility (as contemplated by 40 CFR 125.3). The approach taken also allows the flexibility to establish controls that can appropriately address different sources of pollutants at different facilities.

A. Storm Water Discharges Associated With Industrial Activity From Timber Products Facilities

1. Discharges Covered Under This Sector

Eligibility for coverage under this section is limited to those facilities in the lumber and wood products industry (primary SIC Major Group is 24), except wood kitchen cabinets manufacturers (SIC Code 2434). Permit conditions for facilities in the wood kitchen cabinets manufacturers industry (SIC Code 2434) are discussed in the wood and metal furniture and fixture manufacturing sector (Part XI.W of today's permit). SIC Major group 24 represents those "establishments engaged in cutting timber and pulpwood, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in wood preserving or in manufacturing finished articles made entirely of wood or related materials." [16]

[16] "Handbook of Standard Industrial Classifications," Office of Management and Budget, 1987.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Wood kitchen cabinet facilities (SIC Code 2434) are excluded from coverage under this section because EPA believes it is more appropriate to cover manufacturers of wood cabinets with furniture manufacturing facilities (SIC Major group 25). As indicated in the November 16, 1990, **Federal Register** (55 FR 48008), "Facilities under SIC Code 2434 and 25 are establishments engaged in furniture making." EPA believes that this grouping is more appropriate due to the typical use by cabinet makers of wood treating solutions such as mineral spirits and propenyl butyl.[17] This practice is common to wood furniture manufacturing, but is atypical of the other industrial operations performed at facilities in the lumber and wood products industry (SIC Major group 24).

Certain silvicultural activities are not required to be covered under National Pollutant Discharge Elimination System (NPDES) storm water permits (40 CFR 122.27). In accordance with 40 CFR 122.27(b), point sources that must be covered by an NPDES permit are "any discernible, confined and discrete conveyance related to rock crushing, gravel washing, log sorting, or log storage facilities, which are operated in connection with silvicultural activities and from which pollutants are discharged into waters of the United States." Discharges from nonpoint source silvicultural activities, including harvesting operations (see 40 CFR 122.27) are not required to be covered.

It is EPA's determination harvesting activities include: the felling, skidding, preparation (e.g., delimbing and trimming), loading and initial transport of forest products from an active harvest site. An active harvest site is considered to be an area where harvesting operations are actually on-going. EPA also interprets the definition of harvesting operations to include incidental stacking and temporary storage of harvested timber on the harvest site prior to its initial transport to either an intermediate storage area or other processing site. EPA considers this activity to be an inherent part of harvesting operations. However, EPA does not intend the definition of active harvesting operations to include sites that are processing, sorting, or storing harvested timber which has been transported there from one or more active harvesting sites. Consequently, EPA considers these site activities a point source under 40 CFR 122.27(b)(1) and operators of these sites must seek an NPDES permit for discharges of storm water.

Effluent guidelines have been promulgated for the Timber Products Processing Point Source Category at 40 CFR Part 429 (46 FR 8260; January 26, 1981). Under these regulations, effluent limitations and standards were set for process wastewaters from any timber products processing operation, and any plant producing insulation board with wood as the major raw material. The definition of process wastewater excluded "noncontact cooling water, material storage yard runoff (either raw material or processed wood storage) and boiler blowdown. For the dry process hardboard, veneer, finishing, particleboard, and sawmills and planing mills subcategories, fire control water is excluded from the definition." Any discharge subject to an effluent limitation guideline is not eligible for coverage under this section. Even though discharges of boiler blowdown and noncontact cooling water are not considered "process water discharges," they do not fall under the definition of storm water discharges. As such, this section does not provide for their coverage. In addition, contact cooling waters and water treatment wastewater discharges from steam operated sawmills will not be covered. Finally, material storage yard runoff, exempted from coverage under the effluent limitation guidelines, is eligible to be covered in accordance with the terms and conditions of this section.

In addition, it should be noted that certain wood preserving wastes have been listed under 40 CFR 261.31 as hazardous wastes from nonspecific sources (55 FR 50450; December 6, 1990). Storm water discharges that come in contact and/or commingle with these wastes will be considered a hazardous waste and will not be authorized for discharge under this section. Despite the listing of these wastes, however, there remains a potential for storm water to become contaminated through incidental activities such as tracking of materials, fugitive emissions, and miscellaneous other activities. These discharges are covered under today's permit. Wastewaters, process residuals, preservative or protectant drippage, and spent formulations from wood preserving processes that use chlorophenolic formulations, creosote formulations, or arsenic and chromium formulations have been listed as hazardous wastes. Wastes from wood surface protection were proposed for listing under this subpart (53 FR 53282; December 30, 1988, and 58 FR 25706; April 27, 1993) but listing the wastes was determined unnecessary in a subsequent rulemaking (59 FR 458; January 4, 1994). Storm water discharges containing these wastes are therefore covered under today's permit.

2. Industry Profile/Description of Industrial Activities

Facilities engaged in activities classified under SIC Major Group 24 use wood as their primary raw material. Although there is diversity among the types of final products that are produced at timber products facilities, there are common industrial activities performed among them. These activities are broadly classified for ease of discussion and include the following: log storage and handling; untreated wood lumber and residue generation activities, and untreated wood materials storage; wood surface protection activities, and chemicals and surface protected materials storage; wood preservation activities, and chemicals and preserved wood material storage; wood assembly/fabrication activities and final fabricated wood product storage; and equipment/vehicle maintenance, repair and storage.

In many cases, more than one of these activities may be conducted at a single facility location.

a. Log Storage and Handling. Log storage and handling activities may occur onsite at many types of facilities covered under this section of today's permit, such as wood collection yards and lumber processing and veneer manufacturing facilities. However, facilities that are primarily engaged in these activities (e.g., wood collection yards) are most appropriately classified under SIC Code 2411.

Typical industrial activities performed include loading and unloading of logs onto trucks or railroad cars for transport to other facilities, log

[17] Part 1 Storm Water Group Permit Applications. Summaries from individual applicant descriptions including Applicant No. 1156 (Westvaco), Applicant No. 92 (Bowater), and Applicant No. 866 (Louisiana-Pacific).

sorting, and storage of logs. In addition, some cutting may be performed such as chopping off tree branches and sectioning of tree trunks for easier handling during transport. Although not typically performed at wood collection facilities, chipping may be performed at facilities serving pulp industries. Residues generated at these sites may include bark, coarse sawdust, and wood chunks.

Significant materials that have the potential to come in contact with storm water discharges at facilities practicing these activities include: uncut logs (hardwood and softwoods), wood bark, wood chips, coarse saw dust, other waste wood material, petroleum and other products for equipment maintenance (fuels, motor oils, hydraulic oils, lubricant fluids, brake fluids, and antifreeze), herbicides, pesticides, and fertilizers, material handling equipment (forklifts, loaders, vehicles, chippers, debarkers, cranes, etc.).

These log storage and handling activities described above have the potential to discharge pollutants including bark and wood debris, total suspended solids (TSS), and leachates.[18] The leachate generated from these operations from the decay of wood products can contain high levels of TSS and biochemical oxygen demand (BOD_5).[19]

b. Untreated Wood Lumber and Residue Generation Activities and Untreated Wood Materials Storage. The primary product from sawmills and other cutting activities is lumber. However, residues such as debarked wood chips; whole tree chips and slab wood; bark; and sawdust constitutes approximately 25 percent of the total wood production.[20] At large saw mills, approximately 2,500 lbs of residue is generated for each 1,000 board feet of lumber derived.[21]

Facilities that produce untreated lumber and residues can be classified under most of the SIC Codes in Major group 24. These facilities include saw mill and planing mill facilities classified in group 242; millwork, veneer, plywood and structural wood member manufacturing facilities classified in group 243; wood container manufacturing facilities in group 244; wood building and mobile home manufacturing facilities in group 245; and miscellaneous wood product manufacturers in group 249.

These facilities may engage in one or more activities such as log washing, bark removal, milling, sawing, resawing edging, trimming, planing, machining, air drying, and kiln drying. In addition, there may be associated boiler operations, loading and unloading activities and storage activates.

Effluent guidelines have been established at 40 CFR Part 429 Subparts A, I, and J for discharges from log washing, debarking and wet storage, respectively. These discharges are considered process waters and are subject to the effluent limitations of each subpart.

Some facilities generate residue as a product, in lieu of lumber or other finished products, while other facilities may generate residues as a waste product. In most cases, there are markets for these residues. For example, chips and sawdust are used in the production of pulp and paper and wood products manufacturing. A summary of the residues generated and their potential uses include: bark (used in landscaping, compost, recreational applications (trails), energy recovery); wood chips (used in pulp and paper mill feed, landscaping, recreational applications, fire logs, energy recovery); planer shavings (used in particle board, livestock bedding, compost, fire logs, domestic pet litter, energy recovery); and sawdust (used in particle board, livestock bedding, compost, fire logs, domestic pet litter, energy recovery.)[22]

Storage activities at these sites include wet and dry storage of logs and storage of residuals. Wet storage, called "wet decking," is a process used when logs are to be stored for an extended period of time. Wet storage retards decaying and infestation by insects. The logs may be stored under water in ponds or may be placed in areas where water is continuously sprayed over them. Residuals are typically stored dry.

Storm water discharges from lumber and residue generation and storage may come in contact with the following types of wastes and/or materials at the facility which can then contribute pollutants to the storm water: uncut logs (hardwood and softwoods), wood bark, wood chips, wood shavings, sawdust, green lumber, rough and finished lumber, other waste wood material, nonhazardous wood ash, above and below ground fuel storage tanks for diesel, gasoline, propane and fuel oil, finishing chemicals (stain, lacquer, varnish, paints, water repellant, sealants), solvents and cleaners, petroleum and other products for equipment maintenance (fuels, motor oils, hydraulic oils, lubricant fluids, brake fluids, and antifreeze), herbicides, pesticides, and fertilizers, sawmill equipment, material handling equipment (Forklifts, loaders, vehicles, chippers, debarkers, cranes, etc.), boiler water treatment chemicals, scrap metals, scrap equipment and plastics, boiler blowdown water, and leachate from decaying organic matter.

Pollutants resulting from lumber and residue generation and storage activities are typically conventional in nature. Low pH levels can result from the leachate of decaying organic materials. TSS and BOD_5 may be elevated in this leachate.[23] In addition to leachate, washed away residue particles contribute to TSS loadings. Equipment and machinery at the facility site may result in the discharge of oil and grease.

c. Wood Surface Protection Activities, Chemicals and Surface Protected Materials Storage. At many hardwood saw mills, wood surface protection is conducted to prevent sap stain. Sap stain is the unsightly discoloration of lumber products caused by fungus.[24] Surface protection is a cosmetic fix only and differs from wood preservation which is a practice designed to enhance the wood's structural integrity.

Surface protection is accomplished by one of three methods: spraying, ranging from manual spraying with a garden hose to more sophisticated on-line high pressure spray boxes; dipping, a batch process where lumber is immersed then removed from the formulation; and green chain operations, a continuous immersion operation where lumber is pulled through the protection tanks by conveyer.[25]

Historically, the primary chemical used in surface protection has been commercial pentachlorophenate. Concentrated chemicals are diluted to 0.5 to 1 percent pentachlorophenol for surface protection. This concentration is lower than the 2 percent to 9 percent pentachlorophenol used in wood

[18] "NPDES Docket No. 1085–07–22–402, NPDES Appeal No. 86–14: In the Matter of Shee Atika, Incorporated," January 21, 1988.

[19] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

[20] "Using Best Management Practices to Prevent and Control Pollution from Hardwood Residue Storage Sites," Pennsylvania Hardwoods Development Council, May 15, 1992.

[21] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

[22] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

[23] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

[24] "Background Document Supporting the Proposed Listing of Wastes from Surface Protection Processes, Part One Final Engineering Analysis Volume 1," EPA Office of Solid Wastes, February 1993.

[25] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

preserving. Producers of chlorophenolic formulations used in surface protection have recently discontinued the product due to the pending hazardous waste regulations and it is expected that stocks will soon be exhausted. Alternatives to pentachlorophenate solutions which have been developed and are currently used include: iodo-prophenyl butyl carbamate, dimethyl sulfoxide, didecyl dimethyl ammonium chloride mixtures; sodium azide mixtures; iodo-prophenyl butyl carbamate, didecyl dimethyl ammonium chloride mixture; 8-quinolinol, copper (II) chelate mixtures; iodo-prophenyl butyl carbamate mixtures; sodium ortho-phenylphenate mixtures; 2-(thiocyanomethylthio)-benzothiozole (TCMTB) and methylene bis (thiocyanate) mixture; and zinc naphthenate mixtures.[26]

Industrial activities at saw mills with the potential to contaminate storm water include spills from surface protection areas, storage and mixing tank areas, treated wood drippage, transport or storage areas, maintenance and shop areas, and areas used for treatment/disposal of wastes. Fugitive emissions from negative pressure spraying activities and hand spraying surface protection formulations may also result in the contamination of storm water.[27]

Significant materials that have the potential to come in contact with storm water discharges at facilities practicing these activities include: all of the materials stated in 3.b. above (under untreated wood lumber and residue generation activities and untreated materials storage) plus treated lumber, treatment chemicals, and treatment equipment (dipping tanks, green chain, material handling equipment, etc.).

Pollutants which result from these types of surface protection operations may include the constituents of those surface protection chemicals listed above, as well as aggregate parameters such as BOD_5, COD, and TSS.

d. Wood Preservation Activities, and Chemicals and Preserved Wood Material Storage. Wood preserving is the application of chemicals to wood and wood products to preserve the structural integrity of the wood. Wood preserving is designed to prevent/delay the deterioration/decay of wood through the addition of flame retardants, water repellents, and chemicals. Wood preserving differs from wood surface protection which is generally performed for aesthetic reasons.[28]

Wood preserving is accomplished by two steps. First, the moisture content of wood is reduced to increase its permeability (this is referred to as conditioning). Conditioning may be accomplished by: (1) allowing wood to dry at ambient temperatures; (2) kiln drying; (3) steaming the wood, then applying a vacuum; (4) dipping the wood in a heated salt bath; or (5) vapor drying, and immersing the wood in a solvent (usually naphtha or Stoddard solvent). After conditioning, wood is impregnated with a preservative for fire retardency, insecticidal resistance, and/or fungicidal resistance. Preservation may be accomplished by either nonpressurized and pressurized methods. The nonpressurized method involves dipping stock in a bath containing the preservatives (either heated or at ambient temperatures), while pressurized methods involve subjecting the wood to the preservative when under pressure. After treatment, the wood stock is often subject to cleaning in order to remove excess preservative prior to stacking treated lumber products outside.[29]

There are a number of different avenues by which wood preserving wastes may contaminate storm water. These may include: drippage of condensate or preservative after pressurized treatment; washing after preservation to remove excess preservative, which usually occurs either in the treatment or storage areas; spills and leaks from process equipment and preservative tanks; fugitive emissions from vapors in the process, as well as blow outs and emergency pressure releases; and kick-back (phenomenon where preservative leaks as it returns to normal pressure) from the lumber.[30]

A wide variety of chemicals are used in the preservation of wood, the most common are creosote, pentachlorophenol and inorganics.

Creosote-based preservatives are mixtures of coal-tar derivatives and creosote solutions (creosotes fortified with insecticide additives such as pentachlorophenol, arsenic trioxide, copper compounds or malathion). Pentachlorophenol preservatives are typically formulations using petroleum solvents and 5 percent total pentachlorophenol. Waxes and resins may also be added.[31] Inorganic preservatives consist of arsenical and chromate salts and fluorides dissolved in water. The most commonly used inorganic preservatives include:[32] chromated copper arsenate (CCA); ammoniacal copper arsenate (ACA); acid copper chromate (ACC); chromated zinc chloride (CZC); and fluor-chrome-arsenate-phenol (FCAP).

Significant materials that have the potential to come in contact with storm water discharges at facilities practicing wood preservation include: all of the materials stated in 3.b. (untreated wood lumber and residue generation activities and untreated wood materials storage) plus treated lumber, treatment chemicals, and treatment equipment (preservative, tanks, preservative contaminated material handling equipment).

Pollutants expected to be discharged from wood preserving facilities typically include conventional pollutants such as BOD_5, TSS and oil and grease, as well as toxics which are dependent upon the preserving formulations used. Organic solvent components such as benzene, toluene, xylene, and ethylbenzene can be found at pentachlorophenol preservation operations. Phenolic compounds such as phenol, chlorophenols, nitrophenols can be found at plants using pentachlorophenol and creosote preservatives. The polynuclear aromatic hydrocarbons of creosote, including anthracene, pyrene, and phenanthrene are often contained in the entrained oils. High phenolic, COD, and oil and grease concentrations have been noted to result from creosote and pentachlorophenol operations. Traces of copper, chromium, arsenic, zinc, and boron often can be found in the wastewaters of plants which use waterborne salt preservatives.[33]

e. Wood Assembly/Fabrication Activities and Final Fabricated Wood Product Storage. The industrial

[26] "Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.

[27] "Background Document Support the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.

[28] "Background Document Supporting the Proposed Listing of Wastes from Surface Protection Processes, Part One Final Engineering Analysis Volume 1," EPA Office of Solid Wastes, February 1993.

[29] "Development Document for Effluent Limitations Guidelines and Standards for the Timber Products Point Source Category, Final (EPA 440/1-81/023)," EPA, Effluent Guidelines Division, January 1981.

[30] "Background Document Support the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.

[31] "Background Document Support the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.

[32] "Background Document Support the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.

[33] "Development Document for Effluent Limitations Guidelines and Standards for the Timber Products Point Source Category, Final (EPA 440/1-81/023)," EPA, Effluent Guidelines Division, January 1981.

activities conducted as part of the assembly and fabrication process are very diverse. For the most part, industrial activities that have the potential to come in contact with precipitation are similar to those described under lumber and residue generation (see Section A.3.b). However, there are a number of additional industrial activities that differ. For example, the fabrication of fiberboard, insulation board, and hardboard may involve the use of wax emulsions, paraffin, aluminum sulfate, melamine formaldehyde, and miscellaneous thermosetting resins. These chemicals may be introduced as part of the board formation process or as a coating to maintain the board's integrity. Generally, these additives account for less than 20 percent of the board. In the formation of fiberboard/insulation board/hardboards, the digestion of pulp and fiber by mechanical, thermal, and sometimes chemical means takes place.[34] Another operation which involves resinous agents is the formation of veneer. In this process, veneer is placed in hot ponds or vats to soften the wood. Veneer strips are removed and often bound by glue or a resinous agent. Glues are also used in the assembly of wood components.[35] Other types of activities include the finishing of wood products. Stains, paints, lacquers, varnish, water repellents and sealants, etc. may be applied to some of the wood products. Many of these materials may not have the potential to come in contact with precipitation as most of these processes are performed within a covered area or building.

Pollutants expected to be found in storm water discharges at facilities that perform these types of industrial activities include BOD_5 and TSS. Oil and grease may be present due to material handling equipment and transport vehicles.

f. Equipment/Vehicle Maintenance, Repair and Storage. Many of the facilities included in the SIC Major group 24 employ the use of material handling equipment, vehicles and other machinery. These facilities store the equipment onsite and may also engage in maintenance and repair activities on them. These types of activities are performed in either covered or outdoor areas of the facility. Associated with these activities is the storage of significant materials such as petroleum products and other maintenance fluids such as fuels, motor oil, hydraulic oils, lubricant fluids, brake fluids, solvents, cleaners and antifreeze.

3. Pollutants Contributing to Storm Water Contamination

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the timber products industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: general saw mills and planning mills; wood preserving; log storage and handling; and hardwood dimension and flooring mills, special products saw mills, millwork, veneer, plywood and structural wood, wood containers, wood buildings and mobile homes, reconstituted wood products and wood products not elsewhere classified. Tables A–1 through A–4 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also lists those parameters that EPA has determined may merit further monitoring.

TABLE A–1.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY GENERAL SAWMILLS AND PLANING MILLS FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	34	35	74	73	48.6	47.2	0.0	0.0	440.0	660.0	18.5	18.0	169.8	151.5	400.2	322.6
COD	34	34	75	72	337.0	289.6	0.0	0.0	2156.0	1804.0	115.0	165.5	1346.7	1012.2	3442.9	2170.3
Nitrate + Nitrite Nitrogen	35	34	75	71	0.47	0.47	0.00	0.00	1.50	2.00	0.40	0.40	1.82	1.92	3.57	3.87
Total Kjeldahl Nitrogen	35	34	75	71	2.80	2.42	0.00	0.00	21.00	27.00	1.40	1.40	9.41	7.01	19.18	12.99
Oil & Grease	35	N/A	79	N/A	8.5	N/A	0.0	N/A	55.0	N/A	3.8	N/A	30.5	N/A	62.0	N/A
pH	40	N/A	84	N/A	N/A	N/A	4.7	N/A	9.7	N/A	7.5	N/A	9.5	N/A	10.8	N/A
Total Phosphorus	35	35	75	72	0.61	0.57	0.00	0.00	2.80	3.97	0.30	0.38	2.78	2.34	6.78	5.34
Total Suspended Solids	34	34	74	71	1459	798	1	0	18000	6460	252	400	8998	4376	36040	12921
Zinc	5	5	13	12	0.448	0.362	0.050	0.11	1.7	1.2	0.32	0.29	1.359	0.842	2.456	1.307

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE A–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY WOOD PRESERVING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	9	9	13	13	14.5	14.3	2.4	2.1	39.0	32.0	13.7	12.4	45.9	44.7	84.4	80.9
COD	9	9	13	13	115.2	98.7	36.0	31.0	274.0	191.0	100.0	98.0	264.3	236.1	398.4	362.7
Nitrate + Nitrite Nitrogen	9	9	13	13	1.05	1.47	0.30	0.20	2.20	5.20	0.90	1.10	2.29	4.74	3.36	9.06
Total Kjeldahl Nitrogen	9	9	13	13	2.20	2.25	1.00	0.80	4.00	3.60	2.20	2.20	3.97	4.74	5.21	6.78
Oil & Grease	9	N/A	13	N/A	7.6	N/A	0.0	N/A	80.0	N/A	0.00	N/A	60.9	N/A	380.8	N/A
pH	8	N/A	12	N/A	N/A	N/A	6.0	N/A	16.0	N/A	7.0	N/A	11.4	N/A	13.5	N/A
Total Phosphorus	9	9	13	13	0.44	0.26	0.60	0.06	1.57	0.90	0.25	0.19	1.54	0.74	3.19	1.30

[34] "Development Document for Effluent Limitations Guidelines and Standards for the Timber Products Point Source Category, Final (EPA 440/1–81/023)," EPA, Effluent Guidelines Division, January 1981.

[35] Part 1 Storm Water Group Permit Applications. Summaries from individual applicant descriptions including Applicant No. 1156 (Westvaco), Applicant No. 92 (Bowater), and Applicant No. 866 (Louisiana-Pacific).

TABLE A–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY WOOD PRESERVING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)—Continued

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
Total Suspended Solids	9	9	13	13	242	107	11	12	916	260	50	99	1025	343.8	2661	638.5

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE A–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY LOG STORAGE AND HANDLING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	22	24	52	56	18.7	22.6	0.0	0.0	260.0	130.0	8.3	7.3	66.4	89.3	150.7	206.6
COD	21	23	51	54	286.8	262.1	0.0	0.0	1500	1500	136.0	110.0	1127.8	940.5	2713.2	2110.7
Nitrate + Nitrite Nitrogen	15	17	43	46	0.17	0.19	0.0	0.0	0.82	1.10	0.09	0.11	0.74	0.74	1.61	1.48
Total Kjeldahl Nitrogen	14	17	40	45	2.30	2.14	0.0	0.0	9.30	12.2	1.46	1.30	8.12	5.98	15.63	10.49
Oil & Grease	25	N/A	57	N/A	3.8	N/A	0.0	N/A	37.0	N/A	1.8	N/A	12.9	N/A	24.5	N/A
pH	25	N/A	57	N/A	N/A	N/A	2.8	N/A	8.3	N/A	7.0	N/A	9.3	N/A	10.5	N/A
Total Phosphorus	22	24	52	55	89.49	21.38	0.0	0.0	3000.00	1160	0.20	0.23	15.63	3.86	87.17	13.49
Total Suspended Solids	22	24	52	55	1024	566.8	0.0	0.0	16520	5192	518	164	6657	3121	25663	10723

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE A–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY HARDWOOD DIMENSION AND FLOORING MILLS; SPECIAL PRODUCTS SAWMILLS, NOT ELSEWHERE CLASSIFIED; MILLWORK, VENEER, PLYWOOD AND STRUCTURAL WOOD; WOOD CONTAINERS; WOOD BUILDINGS AND MOBILE HOMES; RECONSTITUTED WOOD PRODUCTS; AND WOOD PRODUCTS FACILITIES NOT ELSEWHERE CLASSIFIED SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	41	42	74	74	55.8	94.9	0.0	0.0	580.0	1925.0	13.5	17	201.8	225.8	532.8	599.6
COD	41	42	74	74	366.3	239.4	636.5	0.0	3315.0	1350.0	151.5	128.0	1155.0	702.3	2417.4	1333.8
Nitrate + Nitrite Nitrogen	41	42	74	74	2.78	1.43	0.0	0.0	66.00	22.5	0.25	0.31	7.49	4.81	25.93	13.03
Total Kjeldahl Nitrogen	41	42	74	74	2.65	2.56	0.0	0.0	14.70	12.5	1.68	1.70	9.11	8.78	18.16	17.85
Oil & Grease	41	N/A	74	N/A	30.7	N/A	0.0	N/A	591.7	N/A	2.0	N/A	74.8	N/A	252.3	N/A
pH	40	N/A	74	N/A	7.0	N/A	3.6	N/A	9.8	N/A	7.0	N/A	9.1	N/A	10.2	N/A
Total Phosphorus	41	42	73	74	0.91	0.55	0.0	0.0	12.00	3.10	0.36	0.38	3.42	2.03	8.15	4.17
Total Suspended Solids	41	42	74	74	891	444	0.0	1.0	17000	3700	242	282	5555	2957	21438	9434

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

The descriptions of industrial activities and significant materials exposed submitted by the group applicants in the wood preserving subsector indicated that these facilities has a high potential to discharge wood preservatives in their storm water discharge. These preservatives typically contain copper and arsenic compounds. The monitoring data which was statistically analyzed for the wood treatment indicated the presence of both arsenic and copper in the discharges. However, data from only eight facilities had been submitted in time for EPA to perform a statistical analysis. EPA, therefore reviewed additional data submitted by wood preserving facilities,and found that copper was present in concentrations greater than the benchmark value in 22 out of 34 observations. Arsenic was higher than bench mark in 12 out of 34 observations.

4. Options for Controlling Pollutants

There are three options for controlling pollutants at timber products facilities: source reduction, best management practices (BMPs), and/or end-of-pipe treatment. In evaluating the options for controlling pollutants in discharges of storm water associated with industrial activity, EPA must provide for compliance with the Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) requirements of Section 402(p)(3) of the Clean Water Act. The variabilities in both the industrial activities performed on a specific site and the storm water discharges from timber product facilities, coupled with the lack of sufficient characterization data make it infeasible to develop effluent limitations at this point in time. EPA believes that enabling the owner/operator of the facility to develop BMPs based on site-specific factors such as facility size, industrial activities performed, climate, geographic location, hydrogeology and the environmental setting of each facility will provide the flexibility needed to address appropriate controls to meet the BAT/BCT requirements. Development of a storm water pollution prevention plan that addresses exposure minimization BMPs, will be required for all facilities that discharge storm water from timber product facilities. EPA believes that exposure minimization BMPs will provide appropriate levels of control for pollutants in storm water discharges while allowing relatively inexpensive BMPs to be implemented.

In some instances, however, more labor and resource intensive structural controls such as sedimentation ponds may be appropriate. EPA believes that the BMPs discussed below will help provide a sufficient level of control for the types of pollutants found in discharges associated with timber product facilities.

In developing these industry-specific BMPs both the part 1 application data for facilities that sampled were reviewed, as well as industry-specific literature sources. The BMPs provided are separated into those most appropriate for certain areas of a site where pollutants may be released such as: log, lumber, and other wood product storage areas; residue storage areas; loading and unloading and material handling areas; chemical storage areas; and equipment/vehicle maintenance, storage and repair areas. These types of activities can be found at all types of timber product facilities. Table A–5 provides a summary of the effective practices for the control of pollutants for all timber product facilities.

TABLE A–5.—EFFECTIVE POLLUTANT CONTROL OPTIONS FOR ALL TIMBER PRODUCT FACILITIES

Activity	Associated BMPs
Log, Lumber, and Other Wood Product Storage Areas.	Divert storm water around storage areas with ditches, swales and/or berms.
	Locate storage areas on stable, well-drained soils with slopes of 2–5 percent.
	Line storage areas with crushed rock or gravel or porous pavement to promote infiltration, minimize discharge and provide sediment and erosion control.
	Stack materials to minimize surface areas of materials exposed to precipitation.
	Practice good housekeeping measures such as frequent removal of debris.
	Provide collection and treatment of runoff with containment basins, sedimentation ponds and infiltration basins.
	Use ponds for collection, containment and recycle for log spraying operations.
	Use of silt fence and rip rap check dams in drainage ways.
Residue Storage Areas	Locate stored residues away from drainage pathways and surface waters.
	Avoid contamination of residues with oil, solvents, chemically treated wood, trash, etc.
	Limit storage time of residues to prevent degradation and generation of leachates.
	Divert storm water around residue storage areas with ditches, swales and/or berms.
	Assemble piles to minimize surface areas exposed to precipitation.
	Spray surfaces to reduce windblown dust and residue particles.
	Place materials on raised pads of compacted earth, clay, shale, or stone to collect and drain runoff.
	Cover and/or enclose stored residues to prevent contact with precipitation using silos, van trailers, shed, roofs, buildings or tarps.
	Limit slopes of storage areas to minimize velocities of runoff which may transport residues.
	Provide collection and treatment of runoff with containment basins, sedimentation ponds and infiltration basins.
	Use of silt fence and rip rap check dams in drainage ways.
Loading and Unloading and Material Handling Areas.	Provide diversion berms and dikes to limit runon.
	Cover loading and unloading areas.
	Enclose material handling systems for wood wastes.
	Cover materials entering and leaving areas.
	Provide good housekeeping measures to limit debris and to provide dust control.
	Provide paved areas to enable easy collection of spilled materials.
Chemical Storage Areas	Provide secondary containment around chemical storage areas.
	Provide fluid level indicators.
	Inventory of fluids to identify leakage.
	Locate storage areas away from high traffic areas and surface waters.
	Develop spill prevention, containment and countermeasure (SPCC) plans and implement.
	Cover and/or enclose chemical storage areas.
	Provide drip pads to allow for recycling of spills and leaks.

Sources:
NPDES Storm Water Group Application—Part 1. Received by EPA March 18, 1991, through December 31, 1992.
"Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.
"Background Document Supporting the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.
"Chlorophenate Wood Protection, Recommendations for Design and Operation," Environment Canada, December 1983.
Wood Preserving; Identification and Listing of Hazardous Wastes; Final Rule, "FEDERAL REGISTER," Volume 55, No. 235, December 6, 1990.
Selected pages from "Texas Best Management Practices for Silviculture," Texas Forestry Association, 1989. Submitted for inclusion by American Pulpwood Association, Washington, D.C.

Wood surface protection and preserving facilities should consider additional controls for their storm water discharges because of the types of pollutants which may contaminate the discharges. Therefore, Table A–6 contains a summary of effective practices for the control of pollutants from timber product facilities that treat their wood. These BMPs are to be considered in conjunction with BMPs in Table A–5.

TABLE A–6.—ADDITIONAL EFFECTIVE POLLUTANT CONTROL OPTIONS FOR TIMBER PRODUCT FACILITIES THAT SURFACE PROTECT OR PRESERVE

Activity	Associated BMPs
Wood surface protection and preserving activities.	Extend drip time in process areas before moving to storage areas.
	Pave and berm areas used by equipment that has come in contact with treatment chemicals.
	Dedicate equipment that is used for treatment activities to that specific purpose only to prevent the tracking of treatment chemicals to other areas on the site.
	Locate treatment chemical loading and unloading areas away from high traffic areas where tracking of the chemical may occur.
	Provide drip pads under conveyance equipment from treatment process areas.
	Provide frequent visual inspections of treatment chemical loading and unloading areas during and after activities occur to identify any spills or leaks needing clean-up.
	Cover and/or enclose treatment areas.
	Provide containment in treated wood storage areas.
	Cover storage areas to prevent contact of treated wood products with precipitation.
	Elevate stored, treated wood products to prevent contact with runon/runoff.

Sources:
NPDES Storm Water Group Application—Part 1. Received by EPA March 18, 1991 through December 31, 1992.
"Regulatory Guidance and Waste Reduction Manual for United States Sawmills (Draft)," EPA Office of Solid Waste, January 12, 1993.
"Background Document Supporting the Proposed Listing of Wastes From Wood Preservation and Surface Protection Processes," EPA Office of Solid Waste, July 1987.
"Chlorophenate Wood Protection, Recommendations for Design and Operation," Environment Canada, December 1983.
Wood Preserving; Identification and Listing of Hazardous Wastes; Final Rule, "FEDERAL REGISTER," Volume 55, No. 235, December 6, 1990.
Selected pages from "Texas Best Management Practices for Silviculture," Texas Forestry Association, 1989. Submitted for inclusion by American Pulpwood Association, Washington, D.C.

Control of sediments leaving the site should also be considered by timber product facilities as sediments contribute to the total suspended solids in the storm water discharges. There are several areas of the site that may be prone to erosion due to intense industrial activities. These areas include, but are not limited to: loading and unloading areas, access roads, material handling areas, storage areas, and any other areas where heavy equipment and vehicle use is prevalent. Specific erosion and sediment controls should be implemented to minimize the discharge of sediments from the site. Measurements that timber facilities may consider include, but are not limited to: stabilization measures such as seeding, mulching, chemical stabilization, sodding, soil retaining measures and dust control and structural measures such as sediment traps, contouring, sediment basins, check dams and silt fences.

5. Special Conditions

a. Prohibition of Non-storm Water Discharges. Today's permit authorizes, in addition to the discharges described in part III.A.2., an additional non-storm water discharge specific to the timber products industry that, when combined with storm water, is authorized to be discharged under this permit. To be authorized under the permit, the sources of non-storm water must be identified in the storm water pollution prevention plan prepared for the facility. Where these discharges occur, the plan must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water components of the discharge. Authorized discharges include the following: spray down of lumber and wood product storage yards.

Spray down of lumber and wood product in storage yards is intermittently performed for fire control and pest control. Discharges from spray down activities are not storm water discharges; however, resulting discharges created as a result of spray down of raw lumber and wood product storage yards are authorized under this section where no chemical additives are used in the spray down waters and no chemicals are applied to the wood during storage. EPA believes that this practice, when performed in compliance with the terms and conditions of this section, will not pose any additional risks to human health and the environment because it is an industrial activity which is performed intermittently and within the confines of an area that should already contain controls for pollutants in storm water discharges.

It should be noted that the following discharges are not authorized under this section: noncontact cooling wastewater; contact cooling wastewater; boiler blowdown and water treatment wastewater; and storm water from areas of surface protection hand spraying activities.

This prohibition of unpermitted non-storm water discharges ensures that these discharges are not inadvertently covered under this section and requires the permittee to submit the appropriate NPDES permit applications to gain coverage for the non-storm water portion of the discharge.

6. Storm Water Pollution Prevention Plan Requirements

Several storm water pollution prevention plan requirements are added in the section of today's permit for the timber products industry, in addition to the baseline conditions described in part VI.C. of today's fact sheet. These deal with the identification and description of potential pollutant sources, and requirements to meet specific good housekeeping, inspection, and sediment/erosion control measures. EPA is also recommending that several criteria be considered during the development of the storm water pollution prevention plan.

a. Contents of the Plan

(1) Description of Potential Pollutant Sources

(a) Drainage—There are no additional requirements beyond those described in Part VI.C.2.a. of this fact sheet.

(b) Inventory of Exposed Materials—This section will require those facilities that have conducted activities associated with wood preserving and wood surface protection with pentachlorophenol formulations, creosote formulations, or arsenic/

chromium formulations in the past to identify: areas where soils are contaminated, treatment equipment, and/or stored materials which remain as a result of these operations. This section will also require the identification of any management practices being employed to minimize the contact of these materials with storm water runoff.

EPA has added these requirements because it is aware through studies performed for the hazardous waste listing process that sites where wood surface protection and wood preserving chemicals have been used in the past continue to contribute pollutants to the storm water discharges that come in contact with them, even once the industrial activity has ceased.[36] In particular, soils that have been contaminated with formulation chemicals, equipment such as dipping tanks and those used for material handling, and wastes and materials that are still stored on the site may continue to release pollutants. EPA is requiring the facility to identify these pollutant sources so that appropriate controls can be implemented.

During the EPA process to list wastes from wood preservation and surface protection processes, data were gathered that showed that the concentration of constituents (of the treatment chemicals) in storm water runoff, in some instances, were equivalent to those concentrations found in process wastewaters. These studies also found high concentrations of phenolic compounds, pentachlorodifluron and phenanthrenes, and metals in soils contaminated with process residuals at several sites. These concentrations were attributed to treated wood drippage and precipitation washoff of treated woods.[37]

Where facilities have used chlorophenolic, creosote, or chromium-copper-arsenic formulations for wood surface protection or preserving activities onsite in the past, and information is available, EPA is requiring that the facility inventory the following: areas where soils are contaminated, treatment equipment, and treated materials remain. Once these areas are identified, measures to minimize their exposure to storm water or to limit discharge of pollutants into storm water must be implemented. EPA is requiring this evaluation because soils, equipment, and other materials that are contaminated by treatment chemicals may continue to be a source of pollutants and can contribute to the contamination of storm water runoff.

(c) Non-storm Water Discharges—There are no additional requirements beyond those described in Part III.A.2. of this permit.

(d) Risk Identification and Summary of Potential Pollutant Sources—There are not additional requirements beyond those described in Part VI.C.2.f. of this fact sheet.

(2) Measures and Controls. As contained in Part VIII.A.5. of this fact sheet, EPA has set forth a number of options which are effective in controlling releases of pollutants to storm water discharges associated with industrial activity. Due to the success of BMPs as a cost effective method of pollution control, EPA is requiring that all facilities consider the implementation of BMPs in the following areas of the site: log, lumber and other wood product storage areas; residue storage areas, loading and unloading areas; material handling areas; chemical storage areas; and equipment/vehicle maintenance, storage and repair areas. The conditions of this section also require facilities that surface protect and/or preserve wood products to address specific BMPs for wood surface protection and preserving activities.

EPA believes it is appropriate to require that permittees indicate in their storm water pollution prevention plan all potential sources of pollution. Effective pollution control measures are currently being implemented at timber product facilities and/or are identified in literature sources specific to timber products facilities. Additional practices may also be found in the "Storm Water Management for Industrial Activities, Developing Pollution Prevention and Best Management Practices" (EPA 832–R–92–006), EPA, September 1992. The determination of the appropriateness or inappropriateness of a measure must be indicated in the facility's storm water management plan.

(a) Good Housekeeping—In addition to typical good housekeeping measures that require the maintenance of areas which may contribute pollutants to storm water in a clean and orderly manner, the pollution prevention plan must specifically address good housekeeping measures and the specific frequency of performance of these measures which are designed to: (1) limit the discharge of wood debris; (2) minimize the leachate generated from decaying wood materials; and (3) minimize the generation of dust.

EPA has specified that BMPs limit the discharge of solids because storm water discharges containing TSS and BOD_5 are prevalent at timber products facilities and can often be controlled by good housekeeping measures.

(b) Preventive Maintenance—This section requires periodic removal of debris from ditches, swales, diversion, containment basins, and infiltration measures. The discharge of solids at timber product facilities may inhibit the performance of storm water controls if they are not maintained properly.

(c) Spill Prevention and Response Procedures—This section requires the development of schedules for response procedures to limit the tracking of spilled materials to other areas of the site. Specifically, this section requires that leaks or spills of wood surface protection or preservation chemicals be cleaned up immediately.

Requirements have been placed in this section to limit the tracking of significant materials that have been leaked or spilled on the site from containers, facility equipment, or onsite vehicles. Of particular concern is the tracking of leaks or spills of treatment chemicals outside near where storm water controls are in place. This may occur, for example, during the filling of storage tanks. Vehicles or equipment used to transfer materials may come into contact with any materials spilled during the filling or emptying of tanks. As the vehicles move to other locations at the site, such material may be tracked and eventually lead to contamination of storm water discharges.

(d) Inspections—Facility operators must conduct visual inspections of BMPs on a quarterly basis. Inspections must be performed quarterly at processing areas, transport areas, and treated wood storage areas of facilities performing wood surface protection and preservation activities. Quarterly inspections are designed to assess the usefulness of practices in minimizing drippage of treatment chemicals on unprotected soils and in areas that will come in contact with storm water discharges. In addition, all timber products facilities must conduct daily inspections of material handling activities and unloading and loading areas whenever activities are occurring in those areas (if activities are not occurring in those areas, no inspection is required).

[36] "Background Document Supporting the Proposed Listing of Wastes from Surface Protection Processes, Part One Final Engineering Analysis Volume 1," EPA Office of Solid Wastes, February 1993.

[37] "Background Document Supporting the Proposed Listing of Wastes from Surface Protection Processes, Part One Final Engineering Analysis Volume 1," EPA Office of Solid Wastes, February 1993.

Records will be required to be maintained showing that these inspections have been performed at the required frequencies. In addition, a set of tracking or follow-up procedures must be implemented to ensure appropriate actions are taken based on the findings of the inspections. These records should be developed on a case-by-case basis depending upon the facility's needs.

(e) Employee Training—There are no additional requirements beyond those listed in Part VI.C.3.e. of this fact sheet.

(f) Sediment and Erosion Control—This section requires that the following areas of the plant be considered for sediment and erosion controls: loading and unloading areas, access roads, material handling areas, storage areas, and any other areas where heavy equipment and vehicle use is prevalent. Sediment and erosion controls include: stabilization measures such as seeding, mulching, chemical stabilization, sodding, soil retaining measures; and dust control and structural measures such as sediment traps, contouring, sediment basins, check dams, and silt fences. This requirement is added because part 2 storm water group permit application data showed that many of the sites were discharging high TSS concentrations in their storm water discharges. Identifying those areas of the site where erosion occurs will aid the permittee in determining appropriate BMPs that will achieve a reduction in TSS loadings.

(g) Storm Water Management—There are no additional requirements beyond those described in Part VI.C.3.h. of this fact sheet.

(3) Comprehensive Site Compliance Evaluation. There are no additional requirements beyond those described in Part VI.C.4. of this fact sheet.

7. Monitoring and Reporting Requirements

(a) Analytical Monitoring Requirements. Under the revised methodology for determining pollutants of concern for the timber products subsectors, all facilities must monitor their storm water discharges. EPA believes that timber product facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, today's permit requires timber products facilities to collect and analyze grab samples of their storm water discharges for the pollutants listed in the applicable Tables (A–7 through A–10). The pollutants listed in Tables A–7 through A–10 were found to be above benchmark levels for a significant portion of facilities in the subsectors that submitted quantitative data in the group application process. Because these pollutants have been reported at or above benchmark levels, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

Today's permit requires the wood preserving subsector to monitor for arsenic and copper. These parameters are commonly found in wood preservatives. The discharge data initially analyzed by EPA indicate that these parameters are found in the storm water discharges from wood preserving facilities. Review of additional sampling data revealed that there was a substantial portion of the facilities discharging these parameters in concentrations greater than the bench mark values. Therefore, EPA has determined that monitoring of arsenic and copper is necessary to ensure that the storm water pollution prevention plans developed by wood preserving facilities adequately addresses sources of these parameters.

Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity". The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, nitrate plus nitrite nitrogen is above the bench mark concentrations for the wood preserving subsector. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in this subsector, EPA has determined that the higher concentrations of nitrate plus nitrite nitrogen are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require wood preserving facilities to conduct analytical monitoring for this parameter.

At a minimum, storm water discharges from timber products facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in the applicable Tables (A–7 through A–10). If the permittee collects more than four grab samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE A–7.—MONITORING REQUIREMENTS FOR GENERAL SAWMILLS AND PLANING MILLS

Pollutants of concern	Cut-off concentration
Chemical Oxygen Demand (COD)	120 mg/L.
Total Suspended Solids (TSS)	100 mg/L.
Zinc, Total Recoverable	0.065 mg/L.

TABLE A–8.—ADDITIONAL MONITORING REQUIREMENTS FOR WOOD PRESERVATION FACILITIES WITH CHLOROPHENOLIC FORMULATIONS

Parameter of concern	Cut-off concentration
Total Recoverable Arsenic	0.16854 mg/L.
Total Recoverable Copper	0.0636 mg/L.

TABLE A–9.—MONITORING REQUIREMENTS FOR LOG STORAGE AND HANDLING FACILITIES

Parameter of concern	Cut-off concentration
Total Suspended Solids (TSS)	100 mg/L.

TABLE A–10.—MONITORING REQUIREMENTS FOR HARDWOOD DIMENSION AND FLOORING MILLS; SPECIAL PRODUCTS SAWMILLS; MILLWORK, VENEER, PLYWOOD AND STRUCTURAL WOOD; WOOD CONTAINERS; WOOD BUILDINGS AND MOBILE HOMES; RECONSTITUTED WOOD PRODUCTS; AND WOOD PRODUCTS FACILITIES NOT ELSEWHERE CLASSIFIED

Parameter of concern	Cut-off concentration
Chemical Oxygen Demand (COD)	120 mg/L.
Total Suspended Solids (TSS)	100 mg/L.

If the average concentration for a parameter is less than or equal to the value listed in the appropriate Tables (A–7 through A–10), then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Tables (A–7 through A–10), then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit.

TABLE A–11.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Tables A–7 through A–10, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Tables A–7 through A–10, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Tables A–7 through A–10. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut off concentrations listed in Tables A–7 through A–10 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities that submitted Part 2 data from the applicable subsectors reported concentrations more than or equal to the values listed in Tables A–7 through A–10. Facilities that achieve average discharge concentrations which are less than or equal to the values in Tables A–7 through A–10 are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, there are monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a

certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports described under paragraph (c) below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, and significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in accordance with Part VI.C of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (c) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Timber products facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination(s) must be made at least once in each of the following 3-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of

a sample impracticable (drought, extended frozen conditions, etc.).

(5) EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

B. Storm Water Discharges Associated With Industrial Activity From Paper and Allied Products Manufacturing Facilities

1. Discharges Covered Under This Section

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from 11 categories of facilities, including paper and allied product manufacturing facilities that are commonly identified by Standard Industrial Classification (SIC) Major Group 26. Today's permit establishes special conditions for the storm water discharges associated with industrial activities at paper and allied product manufacturing facilities. Based on an evaluation of part 1 and part 2 group application data, these facilities were determined to perform similar operations, use similar raw materials, and employ similar material handling and storage practices. In light of the available information, it was determined that the storm water discharge characteristics would be similar for facilities covered by this section.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Industry Profile

SIC Major Group 26, the production of pulp, paper, and paperboard, is a highly diversified industry group which manufactures a variety of products. Products include newsprint, printing and writing papers, bleached and unbleached packaging paper, glassine, tissue papers, vegetable parchment, greaseproof papers, bleached and unbleached paperboard, special industrial papers, and pulp. Pulp, paper, and paperboard is produced from wood and nonwood products such as jute, hemp, rags, cotton linters, bagasse, and esparto. Secondary fibers, or wastepaper, is also used to produce paper and paperboard.

Four standard manufacturing processes are involved in the production of pulp, paper, and paperboard: (1) Raw material preparation, (2) pulping, (3) bleaching, and (4) papermaking.

a. Raw Material Preparation. Wood is the most widely used raw material for manufacturing pulp and paper products. Wood must be prepared for pulping by log washing, bark removal, and chipping/sawing. These activities are usually conducted outdoors and produce large amounts of wood chips, sawdust, and other wood debris. If exposed to storm water, these activities may contribute TSS and BOD_5 to the storm water discharge.

b. Pulping. Pulping involves reducing a cellulosic raw material into a form that may be further processed to produce paper or paperboard, or into a form that may be chemically converted. Two pulping methods are used to reduce the raw material: mechanical pulping and chemical pulping.

Mechanical pulping, also known as groundwood pulping, uses two processes to produce pulp, stone groundwood and refiner groundwood. Stone groundwood uses a grindstone to tear fiber from the side of short logs. Refiner groundwood passes wood chips through a disc refiner. In both processes, wood may be softened with chemicals or heat to reduce the amount of energy required for grinding. Mechanical pulp is very suitable for use in newspapers, catalogs, tissues, and one-time publications.

Chemical pulping, using cooking chemicals under controlled conditions, produces a variety of pulps for multipurposes. This process generally produces high quality paper products. Three types of chemical pulping are used: alkaline, sulfite, and semichemical.

Alkaline pulping, more commonly known as the kraft process, produces a very strong pulp and is adaptable to almost all wood species. The pulp is formed by boiling wood chips in an alkaline solution usually containing sodium sulfate. Alkaline pulping also provides for the successful recovery of chemicals used in the process. This pulping technique is the most highly used pulping process worldwide.

Sulfite pulps are generally prepared from softwoods and produce various types of paper including tissue paper and writing paper. Wood chips are boiled with calcium-based chemicals, magnesium-based chemicals, or ammonia-based chemicals. Calcium was the original sulfite liquor base, however, the spent liquor from this base was difficult and expensive to recover. Many sulfite mills have now been converted to the kraft process or have been shut down because of the problems of chemical recovery and the reduced availability of softwoods.

Semichemical pulping involves the cooking of wood chips from hardwoods with a neutral or slightly alkaline sodium sulfite solution. Both sodium and ammonia-based chemicals are used in this process. Pulps produced from semichemical pulping are used in the manufacture of corrugated paperboard. Semichemical pulping mills practice chemical recovery from the waste liquor by balancing the pH of the waste liquor. Spent liquor is then burned in a furnace.

Some facilities use secondary fibers to produce the paper products. Secondary fibers are wastepapers and may be used with little or no preparation depending on their condition. The wastepaper may be blended directly with the virgin pulps or may have to be screened and filtered to remove dirt before being added to the pulp.

Some secondary fibers must be deinked before use. In order to reclaim a useful pulp, all noncellulosic materials, such as ink, fillers, and coatings, must be removed. This process uses detergents and solvents to remove these materials. The detergents and solvents may be stored in an area exposed to storm water.

c. Bleaching. After pulping, the pulp is brown or deeply colored. The color results from the presence of lignins and resins or residue from spent cooking liquor. The pulp must be bleached to produce a light colored or white product.

A brightness scale ranging up to 100 (the brightest) is used to determine the degree of bleaching needed. For example, newspaper and food containers do not need a high degree of brightness so semibleached pulps are used. For white paper products, fully-bleached pulps are used. A bleaching sequence is followed in which specific chemicals are sequentially added. The following sequence may be used in bleaching: chlorination and washing; alkaline extraction and washing;

chlorine dioxide addition and washing; alkaline extraction and washing, and chlorine dioxide addition and washing.

The sequence may be modified to meet specific bleaching requirements. In general, less bleaching is required for mechanical pulps because they contain all of the wood substrate and would require massive amounts of bleaching. Therefore, mechanical pulps are used to produce lower quality paper products, such as telephone directories, newsprint, and disposable products. Chemical pulps may be brightened to a higher degree. Hydrosulfite, hypochlorite, chlorine, oxygen, and peroxides are used in bleaching and may be stored in areas exposed to storm water.

d. Papermaking. After pulps have been bleached, further mixing and blending may be necessary and noncellulosic materials may be added to prepare the pulp for the papermaking stage. Different types of pulp may be blended for desired effects. Softwood pulps are very strong and are used to make high strength, tear resistant paper. These pulps may be blended with hardwood pulps which add porosity, opacity, and printability qualities to the paper. Other materials may be added to the pulp such as clay, talc, or calcium carbonate to improve the texture, brightness, or opacity of the paper. By adding resin or starch, the paper becomes more ink or water resistant. Each of these additives may be a source of contamination for storm water if stored outdoors.

After noncellulosic materials have been blended with the pulp, it is ready for papermaking. The mixture of pulp and additives is called a pulp furnish. In making paper, fiber from a dilute pulp furnish is placed on a fine screen, called a wire. The water is drained through, and the fiber layer is removed, pressed and dried.

Two basic types of processes are used in papermaking: the cylinder machine and the Fourdrinier. The cylinder machine has wire cylinders which rotate in the dilute pulp furnish and collect fibers. The cylinders deposit the collected fibers on a moving felt to form a fibrous sheet. In the Fourdrinier process, the dilute pulp furnish is placed on a continuous wire belt where the fibrous sheet is formed. The cylinder machine is usually associated with the manufacturing of heavy grades of paper and paperboard; the Fourdrinier process is mostly used for producing paper, but may also be used to make paperboard.

The pressing and drying operations are similar for the two processes. After the fibrous sheet is formed, it is transferred to two or more presses to remove water and enhance smoothness and density. The sheet is then dried by being passed through heated hollow iron or steel cylinders. For a smoother finish, the sheet may be passed through a series of rollers (calendaring) used to produce high density paper.

After the sheet is dry, coatings may be applied to increase appearance, printability, water resistance, or texture. Coatings consist of a high density water slurry of pigments and adhesives that are blended together. Mixtures of starches, latices, polyvinylacetate, and recoverable solvents are used depending on the purpose of the coating. The coating is applied using rolls, air knives, blades, or metering rods. High gloss and smoothness is achieved by using high speed rollers with alternating steel and fabric-filled rolls. The coatings, when stored exposed to storm water discharges may be a source of contamination.

e. Wastewater Treatment. Most pulp, paper, and paperboard facilities have onsite wastewater treatment systems for treating process wastewater, although some facilities may discharge to a POTW. To reduce BOD_5 and TSS loads, many facilities use biological treatment. The most common treatment process is aerated stabilization. At nonintegrated facilities (facilities that do not produce pulp) and secondary fibers facilities, however, primary treatment may be the only method used. At these facilities, primary treatment is usually very effective in reducing BOD_5.

f. Activities Contributing to Storm Water Contamination. Although there is diversity among the types of final products produced at pulp, paper, and paperboard facilities, several industrial activities are common to all. These activities are presented in Table B–1 Below.

Table B–1.—Common Industrial Activities at Paper and Allied Product Manufacturing Facilities

Industrial Activities
Bactericide use
Baghouse, cyclone, dust collectors
Coating
Corrugate
Creasing
Cutting
Equipment storage
Vehicle fueling
Gluing
Rail and Truck loading areas
Material handling sites
Printing
Access Railroads
Scoring
Stitching
Storage areas
Taping

Typical activities performed at pulp, paper, and paperboard facilities include log washing, chipping and cutting of logs, log sorting, log storage, and loading and unloading of logs onto trucks or railroad cars for transport to other facilities. These log storage and handling activities may contribute bark and wood debris, TSS, and leachates to a storm water discharge. Leachates from the decay of wood products may contain high levels of TSS and BOD_5.

Many of the facilities in SIC Major group 26 employ the use of material handling equipment (forklifts, loaders, vehicles, chippers, debarkers, cranes, etc.), vehicles, and other machinery. These facilities store the equipment onsite and may also engage in equipment maintenance and repair activities. These types of activities are performed in either covered or outdoor areas of the facility. Associated with these activities is the storage of signi ficant materials such as petroleum products and other maintenance fluids such as fuels, motor oils, hydraulic oils, lubricant fluids, brake fluids, and antifreeze. When exposed to storm water, these materials may cause contamination of a storm water discharge.

The manufacturing processes at paper and allied product manufacturing facilities are not typically exposed to storm water. Because of the lack of industrial activities occurring outdoors, the primary sources of storm water pollutants originate from materials handling, storage of materials, and waste management or disposal activities. Sources of pollutant are most often from spills and leaks of materials at loading and unloading areas, storage areas, and waste disposal areas. Table B–2 lists the materials that may be exposed to storm water at paper and allied product manufacturing facilities.

Table B–2.—Common Significant Materials at Paper and Allied Product Manufacturing Facilities

Significant Materials Onsite
Solvents
Glues
Fuels

TABLE B–2.—COMMON SIGNIFICANT MATERIALS AT PAPER AND ALLIED PRODUCT MANUFACTURING FACILITIES—Continued

Significant Materials Onsite
Oils
Lubricants
Alcohol
Starch
Wooden pallets
Paper rollstock
Waxes
Air emissions from solvent recovery processes
Baled waste paper
Dyes
Inks
Ammonia
Biocides
Miscellaneous materials removed during pulping
Final products
Adhesives
Paper wastes
Dust and particulates from cyclones used in paper trim activities, resins/polymers
Clay slurries.

3. Pollutants in Storm Water Discharges Associated With Industrial Activity From Paper and Allied Product Manufacturing Facilities

Few pollutants are expected in storm water discharges from the manufacturing of paper and allied products, because the majority of industrial activities occur indoors. Pollutants may be present in storm water as a result of outdoor activities associated with the industry such as discharges which come into contact with the following areas of the site: loading or unloading of materials; outdoor storage of raw materials or unpackaged products; outdoor process activities; dust or particulate generating processes; and illicit connections or inappropriate management practices.

The volume and quantity of storm water discharges associated with industrial activity depend upon a number of factors, including the nature of the industrial activities occurring at the facility, the nature of the precipitation, and the degree of surface imperviousness. Storm water may pick up pollutants from structures and other surfaces as it drains from the facility. Even within a group of facilities with similar activities and materials used, handled, stored, or produced, the quality of the storm water can vary greatly.

The regulatory deadline for submission of the part 2 data was October 1, 1992. Many part 2 data submittals remain incomplete and many of those that did submit data did not identify the significant material or industrial activity that may have contributed the pollutants to the storm water discharge. Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the paper and allied products manufacturing industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: paper mills; paperboard mills, paperboard containers and boxes; and converted paper and paperboard products, except containers and boxes. Tables B–2, B–3, and B–4 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also list those parameters that EPA has determined merit further monitoring. A table has not been included for paper mill facilities because less than 3 facilities submitted data in that subsector.

TABLE B–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY PAPERBOARD MILL FACILITIES SUBMITTING PART II SAMPLING DATA (MG/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	9	9	10	10	164.2	77.7	2.0	0.0	1000.0	306.0	18.0	28.0	733.9	412.7	2708.8	1153.4
COD	9	9	10	10	402.3	228.9	50.0	31.0	1720.0	780.0	200.0	124.5	1318.6	701.4	2729.5	1301.7
Nitrate + Nitrite Nitrogen	9	9	10	10	0.86	0.84	0.00	0.13	3.19	1.85	0.50	0.62	2.83	2.78	5.38	5.31
Total Kjeldahl Nitrogen	9	9	10	10	3.72	3.88	0.52	0.31	10.20	10.8	2.19	2.47	12.88	15.88	25.84	35.33
Oil & Grease	8	N/A	9	N/A	9.3	N/A	1.0	N/A	35.0	N/A	5.0	N/A	37.8	N/A	87.8	N/A
pH	9	N/A	10	N/A	N/A	N/A	7.1	N/A	.....	N/A	7.7	N/A	.....	N/A	.....	N/A
Total Phosphorus	9	9	10	10	0.37	0.31	0.08	0.09	1.50	0.58	0.27	0.29	1.04	0.71	1.86	1.07
Total Suspended Solids	9	9	10	10	481	54.5	9	8.0	3390	198.0	168	36	1840	184.7	5161	370.0

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE B–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY PAPERBOARD CONTAINERS AND BOXES FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	47	44	74	66	21.9	16.9	0.0	0.0	163.0	271.0	10.5	8.0	75.4	47.72	164.5	92.63
COD	47	44	74	67	184.8	115.8	0.0	0.0	2200.0	1400.0	79.5	51.00	698.5	350.8	1663.4	738.9
Nitrate + Nitrite Nitrogen	47	44	74	67	1.03	0.838	0.00	0.0	4.97	5.6	0.59	0.48	3.80	3.07	8.44	6.80
Total Kjeldahl Nitrogen	47	44	74	67	4.23	3.61	0.00	0.0	89.60	64.9	1.94	1.90	11.42	9.69	22.99	18.4
Oil & Grease	47	N/A	74	N/A	4.3	N/A	0.0	N/A	61.0	N/A	1.0	N/A	18.4	N/A	44.4	N/A
pH	47	N/A	72	N/A	N/A	N/A	3.8	N/A	9.0	N/A	6.8	N/A	8.8	N/A	9.9	N/A
Total Phosphorus	46	43	73	66	0.45	0.41	0.00	0.0	10.30	10.8	0.17	0.15	1.12	0.94	2.23	1.79
Total Suspended Solids	47	44	74	66	141	39.55	0	0.0	2340	550	47	12.5	658	157.88	1987	413.3

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE B–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY CONVERTED PAPER AND PAPERBOARD PRODUCTS, EXCEPT CONTAINERS AND BOXES MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	19	17	37	35	26.8	24.2	0.0	0.0	152.0	367.0	6.7	8.0	98.8	70.7	239.9	157.2
COD	19	17	37	36	159.1	154.1	8.0	0.0	1300.0	1486.0	49.0	43.5	484.9	503.4	1137.2	1220.7
Nitrate + Nitrite Nitrogen	19	17	37	34	0.93	0.74	0.00	0.0	5.20	2.44	0.40	0.46	3.17	2.19	6.72	3.98
Total Kjeldahl Nitrogen	19	17	37	35	3.28	2.40	0.00	0.0	38.70	23.1	1.00	1.03	10.95	8.45	25.02	18.1
Oil & Grease	19	N/A	39	N/A	1.9	N/A	0.0	N/A	18.0	N/A	0.6	N/A	7.5	N/A	15.9	N/A
pH	19	N/A	39	N/A	N/A	N/A	4.2	N/A	8.9	N/A	7.0	N/A	8.8	N/A	9.8	N/A
Total Phosphorus	19	17	37	35	0.30	0.28	0.00	0.0	2.58	1.25	0.18	0.15	0.92	0.86	1.76	1.56
Total Suspended Solids	19	17	37	35	89	42.9	0	0.0	1240	761	16	9.0	319	160.0	893	500.8

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

4. Options for Controlling Pollutants

There are two options for reducing pollutants in storm water discharge; end-of-pipe treatment, and implementing best management practices (BMPs) to prevent and/or eliminate the contact between significant materials and storm water. A comprehensive storm water management program for a given plant may include controls from each of these categories and should be based on a consideration of site and facility plant characteristics. End-of-pipe treatment is effective for the control of process waters when the types of pollutants and the volume of water to be treated is known. However, storm water discharges from any industry, including the paper and allied product manufacturing industry, can be numerous, intermittent, and of various volumes. Therefore, the channelization of storm water that comes into contact with significant materials into a single treatment facility, or construction of numerous treatment devices for each discharge, may be burdensome and ineffective for treating pollutants contained in storm water from these types of facilities. EPA believes that the most appropriate means of storm water management at paper and allied product manufacturing facilities can be sufficiently determined by the operator of the facility.

EPA believes that the most effective storm water management control for limiting the offsite discharge of pollutants in storm water is a combination of passive and active BMPs.

Examples of BMPs range from simple housekeeping, material handling practices, preventive maintenance, diversions practices, to more advanced structural control such as detention and retention ponds and infiltration devices.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, volume and type of discharge generated, and number of outfalls. Each facility will be unique in that the source, type and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with the paper and allied product manufacturing industry.

As part of the group application review process, a review of the part 1 data was analyzed. The applications indicated that numerous BMPs were already being implemented at many of the representative sites. Table B–5 provides the most common practices presently being employed and the relative percentage of facilities who are implementing them. Table B–6 provides an additional list of BMPs that may be appropriate for the industry. Many of the BMPs identified are examples of practices intended to limit the exposure of significant materials and industrial activities to storm water. Facility operators should review their current operations and consider implementing these BMPs if they are applicable to the site and are expected to reduce the discharge of pollutants from the site in storm water.

TABLE B–5.—BEST MANAGEMENT PRACTICES DISCUSSED IN PART 1 GROUP APPLICATIONS[i]

BMP	Percent of facilities
Catch Basins	22.2
Diversion structures around potential contaminants	43.8
Spill Control Procedures, Contingency Plans (SPCC)	67.4
Swales, ditches, trench or graded surfaces	51.4
Employee training	62.5

[i] Material Management Practices were identified in over 20 percent of the 144 facilities in the sampling subset.

TABLE B–6.—SUGGESTED BEST MANAGEMENT PRACTICES AT PULP AND ALLIED PRODUCTS MANUFACTURING FACILITIES

Activity	Suggested BMPs
Outdoor loading and unloading	• Confine loading/unloading activities to a designated response and control area. • Avoid loading/unloading materials in the rain. • Cover loading/unloading area/or conduct these activities indoors. • Develop and implement spill plans. • Use berms or dikes around area.

TABLE B–6.—SUGGESTED BEST MANAGEMENT PRACTICES AT PULP AND ALLIED PRODUCTS MANUFACTURING FACILITIES—Continued

Activity	Suggested BMPs
Raw and/or waste material storage areas	• Inspect containers for leaks or damage prior to loading. • Use catch buckets, drop cloths, and other spill prevention measures where liquid materials are loaded/unloaded. • Provide paved areas to enable easy collection of spilled materials. • Confine storage to a designated area. • Store materials inside. • Cover storage areas with a roof or tarp. • Use dikes or berms for storage tanks and drum storage. • Cover dumpsters used for waste paper and other materials. • Store materials on concrete pads to allow for recycling and spills of leaks. • Expedite recycling process for exposed scrap paper. • Develop and implement spill plans.
Log, lumber and other wood product storage areas.	• Provide paved areas to enable easy collection of spilled materials. • Provide good housekeeping (i.e., dust and debris collection) where cyclones are utilized. • Divert storm water around storage areas with ditches, swales, and/or berms. • Practice good housekeeping measures such as frequent removal of debris. • Line storage areas with crushed rock or gravel or porous pavement to promote infiltration, minimize discharge and provide sediment and erosion control. • Use ponds for collection, containment and recycle for log spraying operations.

5. Special Conditions

There are no requirements beyond those described in Part VI.B. of this fact sheet.

6. Storm Water Pollution Prevention Plan Requirements

There are no requirements beyond those described in Part VI.C. of this fact sheet.

a. Description of Potential Pollutant Sources. There are no requirements beyond those described in Part VI.C. of this fact sheet.

b. Measures and Controls. There are no requirements beyond those described in Part VI.C. of this fact sheet.

c. Comprehensive Site Compliance Evaluation. There are no requirements beyond those described in Part VI.C. of this fact sheet.

7. Numeric Effluent Limitation.

There are no effluent limits beyond those described in Part VI.B. of this permit.

8. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. Under the revised methodology for determining pollutants of concern for the various industrial sectors, only one subsector, paperboard mills, is required to monitor storm water discharges. As discussed previously, the median value for COD of 124.5 mg/L is higher than the benchmark value for COD of 120 mg/L for the paperboard subsector, thus triggering monitoring for COD. The monitoring requirements are presented in Table B–7 for paperboard mills.

At a minimum, storm water discharges from paperboard mills must be monitored quarterly during the second year of permit coverage. Monitoring must be performed during each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table B–7. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE B–7.—PAPERBOARD MILLS MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Chemical Oxygen Demand	120 mg/L.

If the average concentration for a parameter is less than or equal to the cut-off concentration, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table B–8.

TABLE B–8.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table B–7, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table B–7, then no further sampling is required for that parameter.

TABLE B–8.—SCHEDULE OF MONITORING—Continued

4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table B–7. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will be used to reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

(1) Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

(2) Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(3) Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall on a pollutant-by-pollutant basis in lieu of monitoring described in Table B–8 under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements) of the permit, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, and that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports required under paragraph b. The permittee is required to complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the date exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained. This certification option is not applicable to compliance monitoring requirements associated with effluent guidelines. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

b. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled.

c. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of a storm water discharge from each outfall are required at all paper and allied products manufacturing facilities. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each designated period during daylight hours unless there is insufficient rainfall or snow-melt to runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Examinations shall be conducted in each of the following periods for the purposes of inspecting storm water quality associated with storm water runoff and snow melt: January through March; April through June; July through September; October through December. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent from one such outfall and report that the examination data also apply to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

C. Storm Water Discharges Associated With Industrial Activity From Chemical and Allied Products Manufacturing Facilities

1. Discharges Covered Under This Section

EPA regulations define "storm water discharges associated with industrial activity" at 40 CFR 122.26(b)(14) in order to specify those discharges that are required to be permitted under the NPDES program. Category (ii) of this definition includes facilities classified as Standard Industrial Classification (SIC) code 28, Chemical and Allied Products Manufacturing, with the exception of facilities classified as SIC code 285—Paints, Varnishes, Lacquers, Enamels, and Allied Products Manufacturing, which are included in category (xi) of the definition. EPA did not receive any group applications from facilities with primary SIC code 283 (Drugs Manufacturing). Therefore, as EPA had no data on such facilities, they are not eligible for coverage under this section of today's permit. The following section describes facilities covered by Part XI.C. of today's permit and the conditions and requirements of facilities covered by Part XI.C.

For additional information on the subsectors and their industrial activities, please see the following documents:

"Development Document for Effluent Limitations Guidelines and Standards for the Paint Formulating Point Source Category." EPA–440/1–79/049–b. 1979.

"Development Document for Interim Final Effluent Limitations Guidelines for the Pesticide Chemicals Manufacturing Point Source Category." EPA–440/1–75/060d. 1976.

"Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Major Organic Products Segment of the Organic Chemicals Manufacturing Point Source Category." EPA–440/1–74–009a. 1974.

"Development Document for Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for Organic Chemicals and the Plastics and Synthetic Fibers Point Source Category." EPA–440/1–87/009. 1987.

"Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Basic Fertilizer Chemicals Segment of the Fertilizer Manufacturing Point Source Category." 1974.

"Development Document for Final Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Pharmaceutical Manufacturing Point Source Category." EPA–440/1–83/084. 1983.

"Development Document for Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Inorganic Chemicals Manufacturing Point Source Category, Phase 2." EPA–440/1–84/007. 1984.

Part XI.C. of today's permit has been developed for storm water discharges at facilities primarily engaged in the manufacture of chemicals and allied products. This sector of industry includes facilities which manufacture a broad range of products including plastic and synthetic materials, detergents, paints and varnishes, drugs, fertilizers and pesticides, adhesives, inks, explosives, artist's inks and paints, and organic and inorganic chemicals used for industrial purposes. Specifically, Part XI.C. of today's permit applies to establishments primarily engaged in manufacturing:

a. Industrial inorganic chemicals (including SIC 281).

b. Plastic materials and synthetic resins, synthetic rubbers, and cellulosic

and other humanmade fibers, except glass (including SIC 282).

c. Soaps and detergents; specialty cleaning, polishing, and sanitation preparations; surface active preparations used as emulsifiers, wetting agents, and finishing agents, including sulfonated oils; perfumes, cosmetics, and other toilet preparations; glycerin made from vegetable and animal fats and oils (including SIC 284).

d. Paints (in paste and ready-mixed form), varnishes, lacquers, enamels, shellac, putties, wood fillers, and sealers, paint and varnish removers, paint brush cleaners, and allied paint products (including SIC 285).

e. Industrial organic chemicals (including SIC 286).

f. Nitrogenous fertilizers; phosphatic fertilizers; fertilizers, mixing only; pesticides; and other agricultural chemicals, not elsewhere classified (including SIC 287).

g. Industrial and household adhesives, glues, caulking compounds, sealants, and linoleum, tile, and rubber cements from vegetable, animal, or synthetic plastics materials (including SIC 2891).

h. Explosives (including SIC 2892).

i. Printing ink, including gravure, screen process, and lithographic ink, and carbon black (including SIC 2893 and 2895); and, due to the nature of manufacturing activities, EPA has included industrial facilities represented by SIC 3952 in this category, but only those primarily engaged in the manufacturing of ink and paints, including china painting enamels, india and drawing ink, platinum paints for burnt wood or leather work, paints for china painting, artists' paints and artists' water colors.

j. Miscellaneous that are not in Sections a. through i. of this part, such as fatty acids, essential oils, nonvegetable gelatin, sizes, bluing, laundry sours, writing and stamp pad ink, industrial compounds, such as boiler and heat insulating compounds, metal, oil, and water treatment compounds, waterproofing compounds, and chemical supplies for foundries (including SIC 2899).

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Pollutants Found in Storm Water Discharges

Water quality impacts caused by storm water discharges associated with an industrial activity from Chemical and Allied Products Manufacturing facilities are expected to vary depending on several factors. Such factors include the geographic location and hydrology of the site, the type of manufacturing and/or industrial activities, the amount and type of operations and material storage occurring outside, imperviousness of surfaces at the site, and the impact of a given precipitation event. In addition, sources of pollutants from non-storm water discharges such as washwaters from industrial areas, illicit connections, and spills may increase the pollutant loading to waters of the United States. Because there is wide variety of products and manufacturing activities in this sector of today's permit, EPA has subdivided the chemicals and allied products manufacturing industry into "subsectors."

Part 1 of the group application required a summary of industrial activities and the significant materials stored exposed to precipitation. This provided useful qualitative information to EPA, but information that is not possible to quantify reliably due to differences in terminology and thoroughness. For the summary of industrial activities, some participants reported their industrial activity as "manufacture of product X," rather than listing the components of that main activity. Other participants listed some or all general industrial actions, e.g., "shredding" or "wastewater treatment." (Products listed represent most of the industrial classifications which are subject to this section of today's permit). Table C.1. lists the general industrial actions occurring at facilities according to part 1 of their group applications.

TABLE C–1.—INDUSTRIAL ACTIVITIES OCCURRING AT CHEMICAL AND ALLIED PRODUCT MANUFACTURERS (AS REPORTED IN PART 1 OF GROUP APPLICATIONS)

1. Storage of materials in tanks, either below or above ground.
2. Wastewater treatment, use of activated sludge process, or land application of wastewaters.
3. Bagging of materials/products.
4. Blending and mixing of chemicals.
5. Packaging of chemicals.
6. Cooling towers.
7. Crushing, Milling, Shredding, Granulation and Grinding of materials.
8. Storage of cylinders used to contain industrial gases.
9. Distribution of products.
10. Storage of empty or full drums.
11. Equipment storage and maintenance, including vehicles.
12. Application of fertilizers or pesticides.
13. Operation of a foundry.
14. Fueling of vehicles.
15. Hazardous waste temporary storage or operation of RCRA treatment, storage, or disposal facility.
16. Hot oil system for cooling/heat exchange.
17. Landfills or temporary refuse site.
18. Application of lime.
19. Loading/Unloading.
20. Use of machinery to process materials.
21. Material handling and warehousing.
22. Plant yard and areas of past industrial activity.
23. Access roads and rail tracks.
24. Steam boilers.

TABLE C–1.—INDUSTRIAL ACTIVITIES OCCURRING AT CHEMICAL AND ALLIED PRODUCT MANUFACTURERS (AS REPORTED IN PART 1 OF GROUP APPLICATIONS)—Continued

25. Thermal oxidation of lead.
26. Washing of drums.
27. Waste dumpster or compactor.

Table C–2 shows the subsectors and their corresponding SIC codes and letters (from discharges covered under this section in this fact sheet).

Part 2 of the storm water group application required that quantitative data be submitted by a representative sampling subgroup. Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the chemical and allied products industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: industrial inorganic chemicals; plastics, synthetics, and resins; drugs; soaps, detergents, cosmetics, perfumes; paints, varnishes, lacquers, enamels, and allied products; industrial organic chemicals; agricultural chemicals; and miscellaneous chemical products. Tables C–2, C–3, C–4, C–5, C–6, C–7, and C–8 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also list those parameters that EPA has determined merit further monitoring. A table has not been included for industrial organic chemical manufacturing facilities because less than 3 facilities submitted data in that subsector.

TABLE C–2.—SUBSECTOR INDEX

Subsector		SIC Code(s)
1	.....	281
2	.....	282
3	.....	284
4	.....	285
5	.....	286
6	.....	287
7	.....	289, 2891, 2892, 2893, 2894, 2899, 3952
8	.....	28[i]

[i] Subsector 8 includes those facilities that indicated their SIC code only as 28, without the following 1 or 2 digits.

TABLE C–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY INDUSTRIAL INORGANIC CHEMICALS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	10	10	16	16	12.1	8.872	0.0	0.0	67.0	26.0	7.0	7.5	35.0	22.8	60.4	34.3
COD	10	10	16	16	101.4	63.6	20.0	0.0	350.0	320.0	80.0	36.5	269.2	185.1	453.4	334.2
Nitrate + Nitrite Nitrogen	10	10	16	16	2.79	1.92	0.60	0.07	7.30	7.1	2.40	1.25	14.72	8.24	37.34	18.7
Total Kjeldahl Nitrogen	10	10	16	16	18.71	7.09	0.00	0.0	132.00	19.4	4.09	3.15	110.69	30.8	392.88	68.3
Oil & Grease	9	N/A	15	N/A	1.9	N/A	0.0	N/A	18.0	N/A	0.1	N/A	9.5	N/A	39.7	N/A
pH	9	N/A	15	N/A	N/A	N/A	5.4	N/A	10.4	N/A	7.6	N/A	11.2	N/A	13.1	N/A
Total Phosphorus	10	10	16	16	0.98	0.83	0.00	0.0	6.59	6.14	0.34	0.40	3.32	3.19	7.55	7.61
Total Suspended Solids	10	10	16	16	156	80.4	6	0.82	790	320	99	21.5	769	658.5	2043	3258.4
Aluminum	7	7	13	13	2.41	1.7	0.49	0.06	7.82	7.87	1.06	0.77	7.02	6.83	12.8	16.47
Iron	5	5	11	11	3.0	2	0.5	0.1	8.8	7.6	2.2	1.2	10.6	8.7	21.7	21.7

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE C–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY PLASTICS MATERIALS AND SYNTHETIC RESINS, SYNTHETIC RUBBERS, CELLULOSIC AND OTHER MANMADE FIBERS EXCEPT GLASS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	16	14	41	36	11.5	11.4	0.0	1.0	66.0	66.0	6.0	6.6	34.1	34.2	62.8	64.8
COD	17	15	42	38	58.1	52.6	0.0	0.0	162.0	169.0	38.5	35.5	191.7	142.6	360.6	237.7
Nitrate + Nitrite Nitrogen	17	15	43	39	4.31	5.35	0.00	0.0	140.30	158.0	0.76	0.95	7.67	8.88	20.81	23.1
Total Kjeldahl Nitrogen	17	15	42	38	3.51	3.96	0.20	0.0	47.20	56.8	1.50	1.40	9.67	10.6	20.29	22.9
Oil & Grease	16	N/A	42	N/A	2.0	N/A	0.0	N/A	15.0	N/A	0.0	N/A	10.2	N/A	22.4	N/A
pH	15	N/A	42	N/A	N/A	N/A	3.6	N/A	7.7	N/A	6.8	N/A	8.4	N/A	9.4	N/A
Total Phosphorus	17	15	43	39	0.40	0.41	0.00	0.0	4.20	4.40	0.11	0.07	1.45	1.56	3.60	4.27
Total Suspended Solids	17	15	42	38	157	94.6	0.0	0.0	2708	816	40	26.5	570	345.4	1665	845.5
Zinc	14	12	36	31	0.391	0.425	0	0	2.1	2.07	0.19	0.23	1.427	1.712	3.183	4.031

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE C–5.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY SOAPS, DETERGENTS, AND CLEANING PREPARATIONS; PERFUMES, COSMETICS, AND OTHER TOILET PREPARATIONS FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	12	13	19	20	53.2	23.2	0.0	0.0	340.0	108.0	16.0	6.5	286.2	99.8	892.7	253.6
COD	12	12	19	19	245.3	132.5	28.0	0.0	1200.0	530.0	120.0	80.0	834.2	486.8	1803.7	1015.5
Nitrate + Nitrite Nitrogen	12	12	19	19	1.40	0.97	0.00	0.0	5.00	4.2	1.16	0.76	5.60	3.17	12.16	5.97
Total Kjeldahl Nitrogen	12	12	19	19	3.48	2.3	0.80	0.0	11.40	9.0	2.60	1.4	8.90	6.93	14.73	12.2
Oil & Grease	12	N/A	19	N/A	4.6	N/A	0.0	N/A	40.0	N/A	0.0	N/A	21.1	N/A	42.8	N/A
pH	12	N/A	19	N/A	N/A	N/A	3.5	N/A	8.0	N/A	7.1	N/A	9.1	N/A	10.5	N/A
Total Phosphorus	12	12	19	19	1.60	0.57	0.02	0.0	9.00	1.9	0.40	0.40	8.93	2.34	28.97	5.20
Total Suspended Solids	13	13	20	20	313	154	6	0.0	1522	880	74	39	1519	633.2	4714	1744
Zinc	6	6	7	7	1.584	0.941	0.13	0.15	4.8	2.7	0.41	0.26	7.438	3.761	20.20	99.146

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE C–6.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY PAINTS, VARNISHES, LACQUERS, ENAMELS, AND ALLIED PRODUCTS FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	3	3	3	3	4.7	20.7	0.0	12.0	11.0	36.0	3.0	14.0	21.6	48.5	42.2	72.7
COD	3	3	3	3	50.3	42.3	0.0	0.0	84.0	72.0	67.0	55.0	94.4	82.8	106.1	95.1
Nitrate + Nitrite Nitrogen	3	3	3	3	0.43	0.53	0.00	0.0	1.20	1.3	0.09	0.28	4.59	2.88	17.50	6.36
Total Kjeldahl Nitrogen	3	3	3	3	1.27	1.56	0.30	0.60	1.90	2.78	1.62	1.30	5.24	4.57	10.52	7.70
Oil & Grease	3	N/A	3	N/A	4.7	N/A	0.0	N/A	9.6	N/A	4.6	N/A	14.1	N/A	20.6	N/A
pH	3	N/A	3	N/A	N/A	N/A	6.7	N/A	7.7	N/A	7.1	N/A	8.0	N/A	8.4	N/A
Total Phosphorus	3	3	3	3	0.24	0.23	0.22	0.13	0.26	0.30	0.24	0.25	0.28	0.44	0.29	0.59
Total Suspended Solids	3	3	3	3	433	47.0	4	2.0	824	130	470	9.0	14276	429.9	104964	1815.8

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE C–7.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY AGRICULTURAL CHEMICALS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	17	17	27	27	4.2	6.00	0.0	0.0	13.0	43.5	4.0	4.0	10.6	19.5	15.2	35.9
COD	17	17	27	27	70.3	45.3	0.0	0.0	400.0	138	55.0	36.0	239.5	166.3	472.2	325.4
Nitrate + Nitrite Nitrogen	12	12	22	22	43.88	19.47	0.00	0.00	315.00	85.0	3.78	3.86	220.52	119.0	898.55	409.7
Total Kjeldahl Nitrogen	17	17	27	27	75.70	92.1	0.00	0.8	1020.00	1460.0	10.00	12.90	214.61	250.0	710.55	777.61
Oil & Grease	17	N/A	28	N/A	8.6	N/A	0.0	N/A	95.0	N/A	0.0	N/A	36.6	N/A	121.2	N/A
pH	15	N/A	2	5N/A	N/A	N/A	5.3	N/A	7.8	N/A	7.1	N/A	8.0	N/A	8.5	N/A
Total Phosphorus	17	17	27	27	15.80	54.96	0.13	0.19	110.00	982.0	5.00	11.0	80.24	180.16	252.70	693.3
Total Suspended Solids	17	15	27	25	434	113	0	0	5182	593.0	103	58	1734	510.8	5506	1251.8
Iron	4	4	9	9	5.3	3.6	0.6	0.6	22	11	1.8	1.5	19	13.2	42.6	28.3
Lead	4	4	6	6	0.094	0.042	0	0	0.167	0.104	0.1	0.03	0.348	0.119	0.652	0.193
Zinc	5	5	10	10	1.527	0.862	0.075	0.063	7.7	4.2	0.58	0.40	6.997	3.116	19.075	6.915

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE C–8.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY MISCELLANEOUS CHEMICAL PRODUCTS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA; (mg/L)

Pollutant	# of Facilities		# of Samples		Grab	Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Mean	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	18	14	26	21	143.2	11.3	0.0	0.0	3420.0	98.0	9.0	6.0	128.6	29.3	353.6	51.4
COD	19	15	28	23	70.4	63.3	0.0	19.0	394.0	382.0	42.5	41.0	180.6	150.1	300.5	247.1
Nitrate + Nitrite Nitrogen	19	14	28	22	0.97	1.00	0.00	0.0	4.88	3.12	0.57	0.60	3.37	3.22	6.79	6.18
Total Kjeldahl Nitrogen	19	15	31	23	1.61	1.34	0.00	0.0	5.50	4.1	1.40	1.10	5.83	4.25	11.27	7.45
Oil & Grease	20	N/A	29	N/A	4.4	N/A	0.0	N/A	23.0	N/A	2.0	N/A	16.8	N/A	32.9	N/A
pH	20	N/A	29	N/A	N/A	N/A	4.6	N/A	9.3	N/A	7.3	N/A	9.2	N/A	10.1	N/A
Total Phosphorus	20	15	29	23	0.18	0.11	0.00	0.0	1.63	0.39	0.07	0.10	0.65	0.32	1.29	0.46

TABLE C–8.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY MISCELLANEOUS CHEMICAL PRODUCTS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)—Continued

Pollutant	# of Facilities		# of Samples			Grab	Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Mean	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
Total Suspended Solids	19	15	28	23	50	47.8	0	0.0	415	350	13	8.0	246	220.5	728	687.3

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

As required in part 1 of the storm water group permit application, participants were required to provide information regarding existing storm water management practices and controls. Table C–9 below identifies the material management practices for the identified sampling facilities.

TABLE C–9.—CURRENT STORM WATER MANAGEMENT PRACTICES USED BY THE CHEMICAL AND ALLIED PRODUCTS MANUFACTURING INDUSTRY (AS REPORTED IN PART 1 OF THE GROUP APPLICATIONS)[i]

Subsector	Current management practices
1	Unloading Boot, Catch Basin, Containment, Covering, Curbing, Dike Diversion, Housekeeping, Inspection of Equipment, Infiltration, Oil/Water Separator, Roof, SPCC, Sump, Storm Water Collector for Water Reuse, Training, Indoor Storage.
2	Catch Basin, Covering, Dike, Indoor Storage, Pond, SPCC, Swale, Vegetation Strip.
3	Caps on Tank Vents, Concrete Pad, Containment, Covering, Curbing, Dike, Diversion, Drain, Hazardous Waste Management, Hazardous Waste Pad, Holding Tank, Indoor Storage, Infiltration, Pond, Roof, Sealed Drums, SPCC, Storm Water Collector, Tarp, Vaulted.
4	Containment, Covering, Dike, Holding Tank, Infiltration, Pond, Roof Drain, Site Inspection, SPCC, Swale, Training, Waste Minimization.
5	Curbing, Dike, Pond, SPCC.
6	Catch Basin, Covering, Dike, Housekeeping, Indoor Storage, Infiltration, Oil/Water Separator, Pond, Roof, Site Inspection, SPCC, Sump, Swale, Sweep, Valves.
7	Absorbent Materials, BMP Plan, Catch Basin, Concrete Pad, Containment, Covering, Curbing, Dike, Drain, Drip Pan, Housekeeping, Indoor Storage, Infiltration, Oil/Water Separator, Pond, Roof, Inspection, Sloped Containment, SPCC, Sump, Swale, Training, Valves.
8	Catch basin, Containment, Covering, Dike, Indoor Storage, Pond, Roof, Site Inspection, SPCC, Swale, Training.

[i] The information presented in this table was received from part 1 group applications for Sector 3.

In order to develop achievable storm water management practices and controls, EPA has evaluated all existing management practices as well as practices developed and implemented under the September 9, 1992, storm water general permit. For a detailed explanation regarding specific storm water controls and management practices, the reader may refer to the pollution prevention plan requirements section below.

4. Special Conditions

a. Prohibition of Non-storm Water Discharges. In addition to the discharges prohibited under Part III.A.2 of today's permit, EPA has specified that the following types of discharges are not authorized by this section:

(1) Inks, paints or substances (hazardous, nonhazardous, etc.) resulting from an onsite spill including materials collected in drip pans.

(2) Washwaters from material handling and processing areas. This includes areas where containers, equipment, industrial machinery, and any significant materials are exposed to storm water.

(3) Washwaters from drum, tank or container rinsing and cleaning.

EPA has included these prohibitions in order to emphasize that spilled materials should be cleaned up and properly disposed, and that washwaters constitute process wastewater and not storm water. These types of discharges contribute excessive amounts of pollutants to water bodies and must be permitted by an NPDES permit for process wastewater, as they are not authorized by this section.

5. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan. Today's permit requires that all facilities covered under this section prepare a Drainage and Site Plan. Based on the information contained in the part 1 application, EPA has identified and specified areas where materials are commonly handled. EPA is requiring that the site plan detail the drainage patterns of the runoff and identify the outfall and receiving water body. [Language on site map not included.]

(1) Description of Potential Pollutant Sources. The Inventory of Exposed Materials as well as Risk Identification and Summary of Potential Pollutants Sources requirements were further defined to avoid confusion. In addition, EPA is requiring that the information submitted in the group application regarding pollutant sources and current management practices be evaluated and considered when developing the plan.

Measures and Controls. EPA has divided this section of the permit into two parts. The first part addresses nonstructural pollution prevention controls, while the second part addresses structural controls.

The following requirements were established by EPA under the nonstructural conditions to identify specific practices that must be implemented by all permittees:

(a) Good Housekeeping—In addition to the information provided in the group application process, EPA conducted a series of inspections to identify areas of concern, materials exposed to storm water and current management practices used by the chemicals and allied products manufacturing industry. EPA also reviewed a series of existing pollution prevention plans that were developed under the requirements of the baseline general permit. Based on this information, EPA is requiring that at a minimum, permittees shall consider establishing the following good housekeeping practices:

(i) Schedule regular pickup and disposal of garbage and waste materials or other measures to dispose of waste. This schedule may be included in the plan. Individuals responsible for waste management and disposal should be informed of the procedures es ablished under the plan,

(ii) Routinely inspect for leaks and conditions of drums, tanks and containers. Ensure that spill cleanup procedures are understood by employees,

(iii) Keep an up-to-date inventory of all materials present at the facility. While preparing the inventory, all containers should be clearly labeled. Hazardous containers that require special handling, storage, use and disposal considerations should be clearly marked and readily recognizable,

(iv) Maintain clean ground surfaces by using brooms, shovels, vacuum cleaners or cleaning machines.

(b) Employee Training—Training should also address procedures for equipment and containers cleaning and washing. The training should emphasize the human hazards and the potential environmental impacts from the discharges of washwaters. In addition, today's permit requires that the pollution prevention plan for chemical and allied products manufacturing facilities identify periodic dates for such training of at least once per year. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to the storm water pollution prevention plan.

(c) Inspections—Qualified personnel shall conduct quarterly inspections. A wet weather inspection (during a rainfall event) shall be conducted in the second (April to June) and third quarters (July to September) of each year. A dry weather inspection (no precipitation) shall be conducted in the first (January to April) and fourth quarters (October to December).

However, where a seasonal arid period is sustained for more than 3 months, a dry weather inspection will satisfy the wet weather inspection requirement. This requirement will assure that permittees conduct at least one inspection every quarter.

EPA believes that this requirement will satisfy the requirements of this section by measuring the effectiveness of the pollution prevention plan during dry and wet weather conditions. These inspections will increase awareness and responsibility for storm water pollution. Moreover, conducting these dry and wet weather inspections on a quarterly basis will provide permittees with a tool for evaluating best management practices, structural and nonstructural measures, good housekeeping and spill cleaning procedures, among other pollution prevention activities.

(d) Facility Security—Facilities should consider evaluating existing security systems such as fencing, lighting, vehicular traffic control, and securing of equipment and buildings and should include existing and new system into the plan to prevent accidental or intentional entry which could cause a discharge of pollutants to waters of the United States.

(e) Structural Storm Water Management Controls—Under the structural conditions, EPA has identified specific practices that should be considered by all permittees. These structural practices are divided into four activities/areas: material handling and storage; management of runoff; sediment and erosion control; and sampling.

(f) Practices for Material Handling and Storage Areas—Under material handling and storage, EPA is recommending a series of management practices to minimize materials exposed to precipitation. These areas were selected after evaluation of part 1 data and current practices used by the group participants. For areas where liquid or powdered materials are stored, facilities shall consider providing either diking, curbing, or berms. For all other outside storage areas including storage of used containers, machinery, scrap and construction materials, and pallets, facilities shall consider preventing or minimizing storm water runon to the storage area by using curbing, culverting, gutters, sewers or other forms of drainage control. For all storage areas, roofs, covers or other forms of appropriate protection shall be considered to prevent exposure to weather. In areas where liquid or powdered materials are transferred in bulk from truck or rail cars, permittees shall consider appropriate measures to minimize contact of material with precipitation. Permittees shall consider providing for hose connection points at storage containers to be inside containment areas and drip pans to be used in areas which are not in a containment area, where spillage may occur (e.g., hose reels, connection points with rail cars or trucks) or equivalent measures. In areas of transfer of contained or packaged materials and loading/unloading areas, permittees shall consider providing appropriate protection such as overhangs or door skirts to enclose trailer ends at truck loading/unloading docks or an equivalent.

In order to prevent facilities from discharging contaminated storm water from areas where precipitation is contained, contained areas should be restrained by valves or other positive means to prevent the discharge of a spill or leak. Containment units may be emptied by pumps or ejectors; however, these should be manually activated. Flapper-type drain valves should not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-or-closed design. If facility drainage is not engineered as above, the final discharge point of all in-facility sewers should be equipped to prevent the discharge in the event of an uncontrolled spill of materials.

(g) Management of Runoff—Under management of runoff conditions, EPA is requiring that the plan contain a description of storm water management practices used and/or to be used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site.

(h) Sediment and Erosion Control—For areas with a potential for significant soil erosion, the permittee should describe permanent stabilization practices to be used in order to stabilize disturbed areas. The measures will minimize the amount of sediment materials in the discharge.

(i) Non-storm Water Discharges—There are no additional requirements beyond those described in Part VI.C of this fact sheet.

(j) Comprehensive Site Comp iance Evaluation—In accordance with 40 CFR 122.24(i)(4)(i), EPA has established that comprehensive site compliance evaluations be conducted at least once every year. Members of the pollution prevention team or a qualified professional designated by the team must conduct the evaluation. Requirements for the evaluation are listed under Part VI.C.4 of this fact sheet.

6. Numeric Effluent Limitations

a. Phosphate Fertilizer Manufacturing Runoff. Part XI.C.5.a. of today's permit establishes numeric effluent limitations for storm water discharges from facilities identified by SIC 287, the Phosphate Subcategory of the Fertilizer Manufacturing Point Source Category, which are subject to effluent limitations guidelines at 40 CFR Part 418. The term contaminated storm water runoff shall mean precipitation runoff, which during manufacturing or processing, comes into incidental contact with any raw

materials, intermediate product, finished product, by-products or waste product. The concentration of pollutants in storm water discharges shall not exceed the following effluent limitations included in Table C–10 below:

TABLE C–10

Effluent characteristics	Effluent limitations (mg/L)	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total Phosphorus (as P)	105.0	35.0
Fluoride	75.0	25.0

Facilities with discharges as described above must be in compliance with these effluent limitations upon commencement of coverage and for the entire term of this permit. Discharges that are associated with industrial activities that do not contain runoff from the areas or activities specified above are not subject to the effluent limitation in Table C–10 above.

7. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that chemical manufacturing facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. Under the revised methodology for determining pollutants of concern for the various industrial sectors, four subsectors in the chemical and allied products manufacturing sector must monitor their storm water discharges. The monitoring requirements are presented in Tables C–11, C–12, C–13, and C–14 for agricultural chemical manufacturing facilities; industrial inorganic chemical facilities; soaps, detergents, cosmetics, and perfume manufacturing facilities; and plastics, synthetics, and resin manufacturing facilities. The pollutants listed in Tables C–11, C–12, C–13, and C–14 were found to be above benchmark levels. Because these pollutants have been reported at benchmark levels from agricultural chemical facilities; industrial inorganic chemical facilities; soaps, detergents, synthetics, and resin manufacturing facilities, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity". The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, nitrate plus nitrite nitrogen is above the bench mark concentrations for the plastics, synthetics, and resins subsector. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in this subsector, EPA has determined that the higher concentrations of nitrate plus nitrite nitrogen are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require plastics, synthetics, and resins facilities to conduct analytical monitoring for this parameter.

At a minimum, storm water discharges from agricultural chemical facilities; industrial inorganic chemical facilities; soaps, detergents, cosmetics, and perfume manufacturing facilities; and plastics, synthetics, and resin manufacturing facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Tables C–11, C–12, C–13, and C–14. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE C–11.—AGRICULTURAL CHEMICALS MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Nitrate plus Nitrite Nitrogen	0.68 mg/L
Total Recoverable Lead	0.0816 mg/L
Total Recoverable Iron	1.0 mg/L
Total Recoverable Zinc	0.065 mg/L
Phosphorus	2.0 mg/L

TABLE C–12.—INDUSTRIAL INORGANIC CHEMICALS MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Aluminum	0.75 mg/L
Total Recoverable Iron	1.0 mg/L
Nitrate plus Nitrite Nitrogen	0.68 mg/L

TABLE C–13.—SOAPS, DETERGENTS, COSMETICS, AND PERFUMES MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Nitrate plus Nitrite Nitrogen	0.68 mg/L
Total Recoverable Zinc	0.065 mg/L

TABLE C–14.—PLASTICS, SYNTHETICS, AND RESIN MANUFACTURING MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Zinc	0.065 mg/L

If the average concentration for a parameter is less than or equal to the cut-off concentration, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table C–15.

TABLE C–15.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Tables C–11, C–12, C–13, and C–14, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Tables C–11, C–12, C–13, and C–14, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Tables C–11, C–12, C–13, and C–14. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will be used to reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

(b). Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring described in Tables C–11, C–12, C–13, and C–14, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, and that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports required under paragraph *c.* below. The permittee is required to complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the date exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum requirements, an additional signed Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30

minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable, permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Compliance Monitoring Requirements. Today's permit requires permittees with phosphate fertilizer manufacturing facilities with contaminated storm water discharges to monitor for the presence of phosphorus and fluoride. These monitoring requirements are necessary to evaluate compliance with the numeric effluent limitation for these discharges. Monitoring shall be performed upon a minimum of one grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. Monitoring results shall be submitted on Discharge Monitoring Report Form(s) postmarked no later than the 31st day of the month following collection of the sample. Facilities which discharge through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit signed copies of discharge monitoring reports to the operator of the municipal separate storm sewer system. Alternative Certification provisions described in Section XI.C.5 of the permit do not apply to facilities subject to compliance monitoring requirements in this section. Compliance monitoring is required at least annually for discharges subject to effluent limitations. Therefore, EPA cannot permit a facility to waive compliance monitoring.

Phosphate fertilizer manufacturing facilities are not required to collect and analyze separate samples for the presence of total phosphorus to satisfy the Compliance Monitoring requirements of Section XI.C.6.c. during a year in which the facilities have collected and analyzed samples for total phosphorus in accordance with the Analytical Monitoring Requirements of Section XI.C.6.a. The results of all Analytical Monitoring analyses may be reported as Compliance Monitoring results in accordance with Section XI.C.5.d.(3) where the monitoring methodologies are consistent.

g. Quarterly Visual Examination of Storm Water Quality. Chemical and allied products manufacturing facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination(s) must be made at least once in each of the following 3-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfall and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.). EPA realizes that if a facility is inactive and

unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

D. Storm Water Discharges Associated With Industrial Activity From Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers

1. Discharges Covered Under This Section

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with an industrial activity." This definition includes point source discharges of storm water from eleven major categories of facilities, including facilities commonly identified by Standard Industrial Classification (SIC) 29. Today's permit only covers storm water discharges associated with industrial activities at facilities which manufacture asphalt paving mixtures and blocks (SIC code 2951), asphalt felts and coatings (SIC code 2952), and lubricating oils and greases (SIC code 2992). Hereinafter, facilities with primary SIC codes 2951 or 2952 will be referred to as "Asphalt Facilities," and facilities with primary SIC code 2992 as "Lubricant Manufacturers."

Section XI.D of today's permit does not apply to renderers of fats and oils, petroleum refining facilities or to oil recycling facilities. Petroleum refining facilities are not eligible for coverage under today's permit, because these types of facilities did not participate in the group application process. Renderers of fats and oils are covered under Section XI.U of today's permit. Oil recycling facilities are covered under Section XI.N of today's permit. These facilities are more appropriately grouped with the liquid waste recyclers covered under Section XI.N.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

This section is applicable to storm water discharges from portable plants. Although portable plants were not included in the group application process the significant materials and industrial activities conducted at these facilities are sufficiently similar to permanent facilities to allow coverage. This section is applicable to storm water discharges from portable plants, with the condition that a new Notice of Intent (NOI) be submitted for each location and the pollution prevention plan be revised accordingly with each change in location.

a. Industry Profile. Presented below are brief descriptions of the industrial activities associated with asphalt facilities and lubricant manufacturers. Table D–1 shows some common significant materials exposed at these types of facilities.

TABLE D–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS [i, ii]

Activity	Pollutant source	Pollutant
Asphalt Paving Manufacturing Facilities		
Material Storage and Handling	Additives, asphalt, asphalt cement, asphalt concrete, asphalt products, asphalt release agents, crushed stone, fuel, granite, granules, gravel, limestone, lubricants, mineral spirits, oil, quartzite rock, reclaimed asphalt pavement (RAP), sand, sandstone, slag.	TSS, Oil and Grease, pH, COD.
Asphalt Roofing Material Manufacturers		
Material Storage and Handling	Mineral spirits, asphalt, asphalt cutbacks, asphalt shingles, limestone, sand, slag, asphalt rolls, asphalt felt, talc oil and fuel.	TSS, Oil and Grease, pH and COD.
Lubricant Manufacturers		
Material Storage and Handling	Oils, waste solvents, petroleum distillates, lubricants, chemical additives.	Oil and Grease, pH, TSS.

[i] Storm water group applications, parts 1 and 2.
[ii] EPA. Development Document on Paving and Roofing Materials (EPA 440/1–74/049).

(1) Manufacturers of Asphalt Paving Mixtures and Blocks (SIC 2951). Manufacturers classified in SIC 2951 store purchased asphalt in above ground tanks. They stockpile a variety of raw materials such as sand, gravel, crushed limestone, and recycled asphalt products (RAP). These facilities produce asphalt concrete, and may also mold and cure asphalt concrete products such as asphalt blocks. There are two types of facilities associated with these activities, batch plants and drum plants.

Batch plants receive aggregate (sand, stone, limestone, gravel, etc.) in bulk by rail or truck. The aggregate is usually stockpiled outside. It is then transported by a conveyor or front-end loader to a rotary drier. When dried and heated the aggregate is transported to a screening unit which separates the aggregate into various sizes and deposits the graded aggregate into hot storage bins. Aggregate and mineral filler are then weighed and transported to a mixing unit or pug mill where they are mixed with heated asphalt cement to produce asphalt concrete. The resulting asphalt concrete is either stored in a heated silo or loaded directly onto trucks for transport to the job site.

At drum (cold feed) plants a measured amount of aggregate is placed in the drum where it is dried and heated. Heated asphalt cement is added to the

same drum and mixed with the aggregate to produce asphalt concrete. The hot asphalt concrete produced by this process then goes to a surge bin or silo for storage until it is loaded onto trucks for delivery.

Hot-mix asphalt plants are often portable. There are three types of portable plants: portable, permanent, and semipermanent. Portable plants move from site to site, and the significant materials and equipment are removed upon completion of the job or project. Portable plants remain at a site anywhere from several days to several months. Permanent portable plants remain at a site on a permanent basis.

Like portable plants, semipermanent plants move from site to site. They differ, however, in that they return to locations on a recurring basis. Significant materials such as aggregate piles remain at the site while the plant is operating elsewhere. For the purposes of this section, semipermanent plants will be referred to as permanent plants, given that the effect on runoff from significant materials will essentially be the same at both sites. 'Asphalt facilities' includes both permanent and portable plants unless specified otherwise.

Facilities which manufacture asphalt concrete block feed the asphalt/aggregate mixture into a block molding machine where the mix is rammed, pressed or vibrated into its final form. The product is then stacked and allowed to cure.

(2) Manufacturers of Roofing Materials (SIC 2952). Manufacturers classified in standard industrial code 2952 typically produce bitumen-based roofing products such as asphalt shingles, built-up roofing (BUR), modified bitumen sheet material, asphalt saturated felts and bitumen-based root coatings, mastics and cements.

The typical manufacturing of bitumen based roofing products, such as shingles, BUR, modified bitumen sheet materials and asphalt saturated felt is a continuous stationary process performed on a roofing machine that begins with a roll of base material such as fiberglass mat, polyester or organic felt, coated or saturated with an asphalt or blend, surfaced with mineral granules, and concludes with a finished product. The sequence of indoor operations builds the product up in stages, adding different raw materials along the way and monitoring their application.

Bitumen-based coatings, mastics and cements are produced inside in a stationary process mixing raw materials received in bulk and containers and blended into finished batches of product. "Batch processing" is the common production method relying on the same piece of equipment in manufacturing a variety of products. The products are packaged in containers or stored for bulk shipment.

(3) Manufacturers of Lubricating Oils and Greases (SIC 2992). Facilities primarily engaged in blending, compounding, and re-refining lubricating oils and greases from purchased mineral, animal, and vegetable materials are identified as SIC code 2992. SIC code 2992 includes manufacturers of metalworking fluids, cutting oils, gear oils, hydraulic brake fluid, transmission fluid, and other automotive and industrial oil and greases.

Raw materials for SIC code 2992 facilities are typically petroleum or synthetic-based stocks and various additives. The majority of lubricating manufacturers store base stocks and chemical additives in tank farms or 55-gallon drums. SIC code 2992 facilities do not manufacture these raw materials, but rather blend and compound them to produce the product. Raw materials are proportioned according to the type of lubricant being produced.

"Batch processing" is the common production method relying on the same piece of equipment in manufacturing a variety of products. For example, in one "batch" a facility may combine the petroleum base stock with additive X in a 10,000 gallon blending tank to produce product "A." Using the same blending tank, the next "batch" is a mixture of the base stock and additive Y to produce product "B." Batch processing allows facilities to manufacture a variety of products. Some facilities, however, tend to specialize in producing a particular type of lubricant (e.g., solid, synthetic, or water-based), often to meet the demands of a specific industry.

Finished products are packaged in containers or stored for bulk shipment. Almost all facilities have shipping and receiving areas and are involved with marketing and interstate distribution of their products. Most facilities have immediate access roads or rail lines at their facility sites.

2. Pollutants in Storm Water Discharges Associated With Asphalt Facilities and Lubricant Manufacturers.

Impacts caused by storm water discharges from asphalt facilities and lubricant manufacturers will vary. Several factors influence to what extent significant materials from these types of facilities and processing operations may affect water quality. Such factors include: geographic location; hydrogeology; the type of industrial activity occurring outside (e.g., material storage, loading and unloading); the type of material stored outside (e.g., asphalt, aggregate, limestone, oil, etc.); the size of the operation; and type, duration, and intensity of precipitation events. These and other factors will interact to influence the quantity and quality of storm water runoff. For example, air emissions (i.e., settled dust) may be a significant source of pollutants at some facilities, while materials storage is a primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections,[38] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Based on group application information and data, EPA has identified the storm water pollutants and sources resulting from asphalt facilities and lubricant manufacturers in Tables D–2 and D–3.

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the asphalt paving and roofing materials manufacturers and lubricating oils and greases manufacturers industry into 2 subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: asphalt paving and roofing materials and lubricating oils and greases manufacturers. The tables below include data for the eight pollutants that all facilities were required to monitor under Form 2F.

[38] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at mineral mining and processing facilities is low yet it still may be applicable at some operations.

TABLE D–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY ASPHALT PAVING AND ROOFING MATERIALS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD^5	25	22	45	41	52.5	13.9	0.0	0.0	1220.0	161.0	8.0	5.0	101.2	42.8	256.1	89.3
COD	26	22	46	40	232.4	207.8	0.0	0.0	2740.0	1880.0	83.5	70.5	800.5	903.4	1897.7	2343.1
Nitrate + Nitrite Nitrogen	26	22	46	41	1.02	0.84	0.00	0.0	19.0	12.0	0.44	0.41	3.43	2.15	8.17	4.08
Total Kjeldahl Nitrogen	25	22	45	39	2.24	1.74	0.00	0.0	19.00	18.0	1.10	0.88	6.75	4.79	13.22	9.19
Oil & Grease	27	N/A	47	N/A	5.5	N/A	0.0	N/A	78.0	N/A	1.3	N/A	21.8	N/A	49.9	N/A
pH	27	N/A	47	N/A	N/A	N/A	2.4	N/A	9.6	N/A	7.2	N/A	10.1	N/A	11.8	N/A
Total Phosphorus	25	22	45	41	0.49	0.51	0.00	0.0	3.90	4.30	0.14	0.19	2.06	1.56	5.22	3.38
Total Suspended Solids	25	22	45	41	669	509.6	0	0.0	8050	3320	286	145	3570	3421	12103	13860

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE D–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY (LUBRICANT OILS AND GREASES MANUFACTURERS) SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	13	8	15	10	10.7	6.70	0.0	0.0	47.0	22.0	4.0	4.0	36.5	22.52	75.2	40.87
COD	15	10	17	12	108.7	57.66	10.0	10.0	905.0	142.6	42.0	55.1	303.0	175.5	622.2	314.1
Nitrate + Nitrite Nitrogen	13	8	15	10	0.64	0.77	0.00	0.0	2.63	2.43	0.21	0.30	5.01	2.88	17.2	5.83
Total Kjeldahl Nitrogen	15	9	17	11	1.76	1.24	0.00	0.19	7.98	3.0	1.10	1.10	5.17	3.86	9.43	6.86
Oil & Grease	16	N/A	18	N/A	7.8	N/A	0.0	N/A	55.0	N/A	2.0	N/A	32.7	N/A	82.2	N/A
pH	14	N/A	16	N/A	N/A	N/A	5.7	N/A	7.9	N/A	7.1	N/A	8.0	N/A	8.6	N/A
Total Phosphorus	15	10	17	12	0.41	0.28	0.00	0.01	3.66	1.28	0.11	0.14	1.30	1.23	3.03	3.18
Total Suspended Solids	15	10	17	12	271	206	0	2	3870	2130	20	28	696	592	2912	2283

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

In evaluating options for controlling pollutants in storm water discharges, EPA must achieve compliance with the technology-based standards of the Clean Water Act [Best Available Technology (BAT) and Best Conventional Technology (BCT)]. This section establishes requirements for the development and implementation of a site-specific storm water pollution prevention plan consisting of a set of BMPs that are sufficiently flexible to address different sources of pollutants at different sites.

Two types of BMPs which may be implemented to prevent, reduce or eliminate pollutants in storm water discharges are those which minimize exposure (e.g., covering, curbing, or diking) and treatment type BMPs which are used to reduce or remove pollutants in storm water discharges (e.g., oil/water separators, sediment basins, or detention ponds). EPA believes exposure minimization is an effective practice for reducing pollutants in storm water discharges from asphalt facilities and lubricant manufacturers. Exposure minimization practices lessen the potential for storm water to come in contact with pollutants. These methods are often uncomplicated and inexpensive. They can be easy to implement and require little or no maintenance. EPA also believes that in some instances more resource intensive treatment type BMPs are appropriate to reduce pollutant levels such as suspended solids and oil/grease in storm water discharges associated with asphalt facilities or lubricant manufacturers. Though these BMPs are somewhat more resource intensive, they can be effective in reducing pollutant loads and may be necessary depending on the type of discharge, types and concentrations of contaminants, and volume of flow.

Table D–4 lists some BMPs which may be effective in limiting the amount of pollutants in storm water discharges from asphalt facilities and lubricant manufacturers. Based on part 1 information, several of the BMPs suggested are already in place at many of the facilities. Part 1 submittals indicate that diking, curbing, or other types of diversion occur at approximately 57 percent of the facilities. Some form of covering is used as a BMP at 25 percent of the facilities, and detention ponds are in place at 19 percent of the facilities. In addition, 38 percent of the facilities submitting part 1 information reported they had a Spill Prevention Control and Countermeasure Plan in place.

TABLE D–4.—MEASURES TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES FROM ASPHALT FACILITIES AND LUBRICANT MANUFACTURERS

Activity	Suggested BMPs
Material Storage, Handling, and Processing	Cover material storage and handling areas with an awning, tarp or roof. Practice good stockpiling practices such as: storing materials on concrete or asphalt pads; surrounding stockpiles with diversion dikes or curbs; and revegetating areas used for stockpiling in order to slow runoff. Use curbing, diking or channelization around material storage, handling and processing areas to divert runon around areas where it can come into contact with material stored or spilled on the ground. Utilize secondary containment measures such as dikes or berms around asphalt storage tanks and fuel oil tanks.

TABLE D–4.—MEASURES TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES FROM ASPHALT FACILITIES AND LUBRICANT MANUFACTURERS—Continued

Activity	Suggested BMPs
	Use dust collection systems (i.e., baghouses) to collect airborne particles generated as a result of material handling operations or aggregate drying. Properly dispose of waste materials from dust collection systems and other operations. Remove spilled material and dust from paved portions of the facility by shoveling and sweeping on a regular basis. Utilize catch basins to collect potentially contaminated storm water. Implement spill plans to prevent contact of runoff with spills of significant materials. Clean material handling equipment and vehicles to remove accumulated dust and residue. Use a detention pond or sedimentation basin to reduce suspended solids. Use an oil/water separator to reduce the discharge of oil/grease.

4. Storm Water Pollution Prevention Plan Requirements

EPA believes that pollution prevention is the most effective approach for controlling contaminated storm water discharges from asphalt facilities and lubricant manufacturers. Pollution prevention plans allow the operator of a facility to select BMPs based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology, the environmental setting of each facility, and volume and type of discharge generated. This flexibility is necessary because each facility will be unique in that the source, type and volume of contaminated surface water discharges will differ from site to site.

All facilities subject to this section must prepare and implement a storm water pollution prevention plan. The establishment of a pollution prevention plan requirement reflects EPA's decision to allow operators of asphalt facilities and lubricant manufacturers to utilize BMPs as the BAT/BCT level of control for the storm water discharges covered by this section. The requirements included in pollution prevention plans provide a flexible framework for the development and implementation of site specific controls to minimize pollutants in storm water discharges. This is consistent with the approach in EPA's storm water baseline general permits finalized on September 9, 1992 (57 FR 41236).

There are two major objectives to a pollution prevention plan: (1) To identify sources of pollution potentially affecting the quality of storm water discharges associated with industrial activity from a facility; and (2) to describe and ensure implementation of practices to minimize and control pollutants in storm water discharges associated with industrial activity from a facility. Specific requirements for a pollution prevention plan for asphalt facilities and lubricant manufacturers are described below. These requirements must be implemented in addition to the baseline pollution prevention plan provisions discussed previously.

a. Description of Potential Pollution Sources. There are no additional requirements beyond those described in Part VI.C.2. of this fact sheet.

b. Measures and Controls. There are no additional requirements beyond those described in Part VI.C.3. of this fact sheet.

c. Comprehensive Site Compliance Evaluation. The storm water pollution prevention plan must describe the scope and content of comprehensive site evaluations that qualified personnel will conduct to: (1) Confirm the accuracy of the description of potential pollution sources contained in the plan; (2) determine the effectiveness of the plan, and (3) assess compliance with the terms and conditions of today's permit.

Comprehensive site compliance evaluations shall be conducted at least once a year for asphalt facilities and lubricant manufacturers. The individual or individuals who will conduct the evaluations must be identified in the plan and should be members of the pollution prevention team. Inspection reports must be retained for at least 3 years after the date of the evaluation.

Comprehensive site compliance evaluations shall be conducted at least once a year at portable plant locations. Such evaluations shall be conducted at least once at portable plant locations that are not in operation a full year.

Based on the results of each evaluation, the description of potential pollution sources, and measures and controls, the plan must be revised as appropriate within 2 weeks after each evaluation. Changes in the measures and controls must be implemented on the site in a timely manner, but no later than 12 weeks after completion of the evaluation.

For portable plants, the plan must be revised as appropriate as soon as possible, but no later than 2 weeks after each evaluation. Two weeks is adequate time for portable plants to modify their plans due to the simpler and smaller nature of these operations in comparison to permanent facilities.

5. Numeric Effluent Limitations

In addition to the numeric effluent limitations established under Part V.B, part XI.D.4 of today's permit includes numeric effluent limitations for storm water discharges resulting from the production of asphalt paving and roofing emulsions. Discharges from areas where production of asphalt paving and roofing emulsions occurs may not exceed a TSS concentration of 23.0 mg/L of runoff for any one day, nor shall the average of daily values for 30 consecutive days exceed a TSS concentration of 15.0 mg/L of runoff. Oil and grease concentrations in storm water discharges from these areas may not exceed 15.0 mg/L of runoff for any 1 day, nor should the average daily values for 30 consecutive days exceed an oil and grease concentration of 10.0 mg/L of runoff. The pH of these discharges must be within the range of 6.0 to 9.0. Facilities with such discharges must be in compliance with these effluent limitations upon commencement of coverage and for the entire term of the permit. These effluent limitations are in accordance with 40 CFR 443.12 and 40 CFR 443.13, Effluent Guidelines and Standards, Paving and Roofing Materials Point Source Category, Asphalt Emulsion Subcategory. These limitations represent the degree of effluent reduction attainable by the application of best practicable control technology and best available technology.

6. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. Under the revised methodology for determining pollutants of concern for the various industrial sectors, only asphalt paving and roofing

materials manufacturers are required to perform analytical monitoring of storm water discharges. As discussed previously, the median composite sample concentration for TSS of 145 mg/L is higher than the benchmark value for TSS of 100 mg/L for the asphalt paving and roofing materials subsector, thus triggering monitoring for TSS. The monitoring requirements are presented in Table D–5 for asphalt paving and roofing materials manufacturers.

At a minimum, storm water discharges from asphalt paving and roofing materials manufacturers must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table D–5. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE D–5.—ASPHALT PAVING AND ROOFING MATERIALS MANUFACTURERS MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Suspended Solids	100 mg/L.

If the average concentration for a parameter is less than or equal to the cut-off concentration, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table D–6.

TABLE D–6.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table B–7, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table B–7, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table B–7. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will be used to reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

(1) Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

(2) Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(3) Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has

determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring described under paragraph *b.* below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, and that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports required under paragraph *b.* (below). If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent guidelines. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

b. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled.

EPA also believes that between quarterly visual examinations and site compliance evaluations potential sources of contaminants can be recognized, addressed, and then controlled with BMPs. In determining the monitoring requirements, EPA considered the nature of the industrial activities and significant materials exposed at these sites, and performed a review of data provided in Part 2 group applications.

c. Quarterly Visual Examination. Quarterly visual examinations of a storm water discharge from each outfall are required at asphalt facilities and lubricant manufacturers. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each designated period during daylight hours unless there is insufficient rainfall or snow-melt to runoff. Where practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Examinations shall be conducted in each of the following periods for the purposes of inspecting storm water quality associated with storm water runoff and snow melt: January through March; April through June; July through September; October through December. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual inspection will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

d. Compliance Monitoring Requirements. Today's permit requires permittees with storm water discharges associated with the production of asphalt paving or roofing emulsions to monitor for the presence of total suspended solids, oil and grease, and for pH at least annually. These monitoring requirements are necessary to evaluate compliance with the numeric effluent limitation imposed on these discharges. Monitoring shall be performed upon a minimum of one grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. Monitoring results shall be submitted on Discharge Monitoring Report Form(s) postmarked no later than the last day of the month following collection of the sample. For each outfall, one Discharge Monitoring Report form must be submitted per storm event sampled. Facilities which discharge through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit signed copies of discharge monitoring reports to the operator of the

municipal separate storm sewer system. Alternative Certification provisions described in Section XI.D.5 do not apply to facilities subject to compliance monitoring requirements in this section. Compliance monitoring is required at least annually for discharges subject to effluent limitations. Therefore, EPA cannot permit a facility to waive compliance monitoring.

Asphalt emulsion manufacturing facilities are not required to collect and analyze separate samples for the presence of TSS to satisfy the Compliance Monitoring requirements of Section XI.D.5.d. during a year in which the facilities have collected and analyzed samples for TSS in accordance with the Analytical Monitoring requirements of Section XI.D.5.a. The results of all TSS Analytical Monitoring analyses may also be reported as Compliance Monitoring results in accordance with Section XI.D.5.d.(3) where the monitoring methodologies are consistent.

E. Storm Water Discharges Associated With Industrial Activity From Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities

1. Discharges Covered Under This Section

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from eleven categories of facilities. Category (ii) identifies facilities classified as Standard Industrial Classification (SIC) code 32 as having storm water discharges associated with an industrial activity.

The following section describes the industrial activities and permit conditions for storm water discharges associated with industrial activity classified under Major SIC Group 32. The discussion focuses on the industries covered by today's permit. There are industries in Major SIC Group 32 beyond those discussed below; however, representatives of these industries did not choose to participate in the group application process on which this section is based. Therefore, they are not eligible for coverage under this permit.

This section only covers storm water discharges associated with industrial activities from facilities engaged in gypsum, cement, clay, glass, and concrete products manufacturing.[39] Facilities subject to the requirements of this section include the following types of manufacturing operations: flat glass, (SIC code 3211); glass containers, (SIC code 3221); pressed and blown glass, not elsewhere classified, (SIC code 3229); hydraulic cement, (SIC code 3241); brick and structural clay tile, (SIC code 3251); ceramic wall and floor tile, (SIC code 3253); clay refractories, (SIC code 3255); structural clay products not elsewhere classified (SIC code 3259); vitreous table and kitchen articles (SIC code 3262); fine earthenware table and kitchen articles (SIC code 3263); porcelain electrical supplies, (SIC code 3264); pottery products, (SIC code 3269); concrete block and brick, (SIC code 3271); concrete products, except block and brick (SIC code 3272); ready-mix concrete, (SIC code 3273); gypsum products, (SIC code 3275); minerals and earths, ground or otherwise treated, (SIC code 3295); and nonclay refractories, (SIC code 3297).

Wash waters from vehicle and equipment cleaning areas are process wastewaters. This section does not cover any storm water that combines with process wastewater, unless the process wastewater is in compliance with another NPDES permit. This section does not cover any discharge subject to an existing or expired NPDES general permit. The section may cover runoff which derives from the storage of materials used in or derived from the cement manufacturing process[40] unless storm water discharges are already subject to an existing or expired NPDES permit.

Discharges from several industrial activities in Major SIC Group 32 are not covered by this section. These activities are: lime manufacturing (SIC 3274); cut stone and stone products (SIC 3281); abrasive products (SIC 3291); asbestos products (SIC 3292); and mineral wool and mineral wool insulation products (SIC 3297).

These types of facilities are not covered by this (or any other) section of today's permit, because these types of industrial activities were not represented in the group application process nor are they believed to be sufficiently similar to industrial activities that were included in the group application process. Because these facilities were not included in the group application process there is no additional information with which to develop industry-specific permit language.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

a. Industry Profile. Part XI.E. of today's permit has been developed for storm water discharges from glass, clay, cement, concrete, and gypsum products manufacturers. As stated above, these facilities are regulated under category (ii) of the definition of storm water discharges associated with industrial activity. Part XI.E. of today's permit addresses the industry-specific permit requirements for storm water discharges from these industries.

There are a variety of industrial processes that occur at manufacturing facilities covered under this section. The following descriptions summarize basic operations occurring at each type of industry.

(1) Glass Product Manufacturing. Facilities primarily engaged in the manufacturing of glass and glassware, or manufacturing glass products from purchased glass are classified under standard industrial groups 321–323. Facilities covered by these SIC codes share several similar steps in the manufacturing process. Such processes include the storage of raw materials, weighing the materials, charging, melting and forming. Although the forming processes vary greatly, the steps with a potential exposure to storm water are somewhat homogeneous.

The first step in the glass manufacturing process is batch preparation. This involves the selection and storage of the raw materials that will be used in the process. Such materials may include silica sand, limestones, feldspars, borates, soda ash, boric acid, potash and barium carbonate. Once the desired characteristics of the final product are

[39] Please note that storm water discharges associated with industrial activity from facilities identified as SIC code 323 (glass products made of purchased glass) only occur where material handling equipment or activities, raw materials intermediate products, final products, waste materials, by-products or industrial machinery are exposed to storm water. SIC code 323 facilities are only required to submit storm water permit applications when activities or materials are exposed to storm water.

[40] These discharges are subject to effluent limitation guidelines under 40 CFR 412.11.

assessed, the composition of the batch is determined and the raw materials are mixed together. The batch is then conveyed to the furnaces.

Furnaces are used to melt the batch to produce glass. Most of the furnaces in the glass manufacturing industry are fueled by natural gas or oil. The batch is placed in the furnace and allowed to melt. Once the glass has been melted and conditioned it is channeled to a forming machine.

Forming operations consist of up to four major steps, the first of which involves a further conditioning process to prepare the glass for primary forming. Primary forming, which may include drawing, blowing, pressing, or casting, is the second step in the forming operation. This operation is usually followed by an annealing step. Annealing is the process of subjecting the glass to heat and slow cooling in order to toughen the product. The final process in the forming operation may include one or more secondary operations. Operations such as grinding and polishing, laminating, sealing and coating of glass are common secondary operations. Materials used for secondary operations vary, examples are the resins used to laminate glass to produce safety glass products, such as car windows.

(2) Cement Manufacturing. Facilities primarily engaged in manufacturing hydraulic cement (e.g., portland, natural, masonry, and pozzolana cements) are identified as SIC code 3241. The manufacturing process is generally the same for all facilities classified as SIC 3241. The three basic steps in cement manufacturing are: (1) Proportioning, grinding, and blending raw materials; (2) heating raw materials to produce a hard, stony substance known as "clinker"; and (3) combining the clinker with other materials and grinding the mixture into a fine powdery form.

The first step in cement manufacturing is proportioning, grinding and blending raw materials. The primary raw material is lime. Lime is typically obtained from limestone, cement rock, oyster shell marl, and chalk. Other ingredients in cement manufacturing may include silica, alumina, and iron. The blending and grinding of these raw materials is achieved through either "wet" processing or "dry" processing. Wet processing operations use water when grinding and blending raw materials, and dry processing operations grind and blend raw materials in a dried state. Until they are fed into kilns for clinker production, materials ground from wet processing are stored in slurry tanks, while dry processing materials are stored in silos.

Kilns typically are coal, gas, or oil fired. In the kiln raw materials are commonly heated to a temperature of 1600 degrees Celsius (2900 degrees Fahrenheit). At these extreme temperatures, clinker is formed as raw materials begin to fuse and harden. Air is then used to cool clinker emerging from the kiln.

The final stage of the process involves adding small amounts of gypsum or stone (used to control setting times) to the clinker and grinding the mixture into a fine powdery form. The powdery product is then cooled before storage, bagging, and shipping.

There are facilities classified as SIC 3241 which only perform the final grinding step in the cement manufacturing process. These facilities do not have kilns to heat raw materials, and so obtain clinker from manufacturing plants.

(3) Clay Product Manufacturing. Facilities primarily engaged in manufacturing clay products, including brick, tile (clay or ceramic), or pottery products are classified as standard industrial groups 325 and 326. Although clay product manufacturing facilities produce a wide variety of final products, there are several similar processing steps shared by most facilities in this industry: (1) Storage and preparation of raw materials; (2) forming; (3) drying; (4) firing; and (5) cooling.

Manufacturers classified as standard industrial groups 325 and 326 typically use clay (common, silt, kaolin and/or phyllite) and shale (mud, red, blue and/or common) as their primary raw materials. However, some industries supplement these materials with slag (cinders), cement and lime. Raw materials are generally stored outside.

Raw materials are crushed and ground prior to manufacturing. Stones are removed, and particles of raw materials are screened to ensure they are the correct size. Water is then added to raw materials in mixing chambers and "mud" is formed. The mud is molded into the desired product during the forming stage. Depending on the final product, one of several different methods will be used when forming mud into the desired shape. The most common methods use pressure or hydraulic machines to shape products.

Following the forming process, products are left to dry. Drying is necessary to reduce the moisture content prior to firing. A common method for reducing moisture content is air drying clay products in a controlled environment (e.g., a drying chamber). When the drying process is complete, the clay is ready for firing in kilns.

There are two basic types of kilns: the periodic kiln and the tunnel kiln. With a periodic kiln, products are fired for a specified period of time and then promptly removed. With a tunnel kiln, products pass through the kiln on conveyor belts, and by the time the clay reaches the end of the kiln, the firing process is complete. The primary source of energy for most firing kilns is natural gas. Natural gas is typically supplemented with coal, sawdust, or oil. Fired products may then be glazed with salt or other materials for special applications.

(4) Concrete Products. Facilities primarily engaged in manufacturing concrete products, including ready-mixed concrete, are identified as SIC group 327. Although concrete product facilities in SIC group 327 produce a variety of final products, they all have common raw materials and activities.

Concrete products manufacturers combine cement, aggregate, and water to form concrete. Aggregate generally consists of: sand, gravel, crushed stone, cinder, shale, slag, clay, slate, pumice, vermiculite, scoria, perlite, diatomite, barite, limonite, magnetite, or ilmenite. Admixtures including fly ash, calcium chloride, triethanolamine, calcium salt, lignosulfunic acid, vinosol, saponin, keratin, sulfonated hydrocarbon, fatty acid glyceride, vinyl acetate, and styrene copolymer of vinyl acetate may be added to obtain desired characteristics, such as slower or more rapid curing times.

Typically, aggregate is received in bulk quantities by rail, truck, or barge. It is stored outside, and kept moist, until it is conveyed to distribution bins. The first stage in the manufacturing process is proportioning cement, aggregate, admixtures and water, and then transporting the product to a rotary drum, or pan mixer.

To form concrete block and brick, the mixture is then fed into an automatic block molding machine that rams, presses, or vibrates the mixture into its final form. The final product is then stacked on iron framework cars where it cures for 4 hours. Decorative blocks may be produced by adding colors to the mix, or splitting the surface into desired shapes.

Precast concrete products, may contain steel structural members for increased strength. These products include transformer pads, meter boxes, pilings, utility vaults, steps, cattle guards, and balconies. After being mixed in a central mixer, concrete is poured into forms or molded in the same manner as concrete block and

brick. Forms are often coated with a release oil to aid stripping. The concrete "sets" or cures in the forms for a number of hours (depending upon the type of admixtures used). When the concrete has cured, the forms are removed. Forms are washed for reuse, and the concrete products are stored until they can be shipped.

In addition to the permanent concrete product facilities, there are a number of portable ready mix concrete operations which operate on a temporary basis. The portable plants are typically dedicated to providing ready mix concrete to one construction project. Portable plants have the same significant materials and industrial activities as permanent facilities. Therefore, portable concrete plants are eligible for coverage under Part XI.E. of today's permit.

(5) Gypsum Products Manufacturing. Facilities primarily engaged in manufacturing plaster, wallboard, and other products composed wholly or partially of gypsum (except plaster of paris and papier-mâché) are classified as SIC code 3275.

The gypsum product manufacturing process begins with calcining the gypsum: finely ground raw gypsum (referred to as "land plaster") is fed into imp mills or calcining kettles where extreme heat removes 75 percent of the gypsum's molecular moisture. The result is a dry powder called stucco, which is cooled and conveyed to storage bins.

To produce wallboard, stucco is fed into pin mixers where it is blended with water and other additives to produce a slurry. The slurry is then applied to continuous sheets of paper to form wallboard. In addition to producing wallboard, some facilities may combine stucco with additives (excluding water) to produce plaster. Plaster is then bagged or bulked and shipped off site for purchase.

EPA considers calcining the first step in gypsum product manufacturing. Many facilities with a primary SIC code of 3275 may have mining/quarry and crushing activities at their sites. Please note, however, that because these activities are not considered part of the manufacturing operations, storm water discharges from mining/quarry and crushing are not covered under Part XI.E. of the today's permit. Discharges associated with gypsum mining activities are addressed under Part XI.J. of today's permit and VIII.J. of the fact sheet.

2. Pollutants in Storm Water Discharges Associated With Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing

Impacts caused by storm water discharges from gypsum, concrete, clay, glass, and concrete manufacturing operations will vary. Several factors influence to what extent industrial activities and significant materials from these types of facilities and processing operations can affect water quality. Such factors include: geographic location; hydrogeology; the type of industrial activity occurring outside (e.g., material storage, loading and unloading, or vehicle maintenance); the type of material stored outside (e.g., aggregate, limestone, clay, concrete, etc.); the size of the operation; and type, duration, and intensity of precipitation events. These and other factors will interact to influence the quantity and quality of storm water runoff. For example, air emissions (i.e., settled dust) may be a significant source of pollutants at some facilities, while material storage is a primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections,[41] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Table E–1, Potential Sources of Pollutants in Storm Water Discharges Associated with Glass, Clay, Cement, Concrete, and Gypsum Manufacturing, summarizes the industrial activities indicated in the part 1 group applications for facilities covered under this section of today's permit. Table E–1 also lists the likely sources of contamination of storm water that are associated with this activity. The third column of the table lists the pollutants or the indicator parameters for the pollutants which may be present in the storm water discharges associated with the industrial activity. The table is limited to the industrial activities which are commonly exposed to storm water. Industrial activities which predominantly occur indoors, such as glass forming, are not listed in Table E–1.

TABLE E–1.—POTENTIAL SOURCES OF POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH GLASS, CLAY, CEMENT, CONCRETE, AND GYPSUM MANUFACTURING

Activity	Pollutant source	Pollutants/indicators
Material Storage at Glass Manufacturing Facilities.	Exposed or spilled: sand, soda ash, limestone, cullet, and petroleum products.	TSS, COD, oil and grease, pH, lead.
Materials Storage at Clay Products Manufacturing Facilities.	Exposed: ceramic parts, pryophyllite ore, shale, ball clay, fire clay, kaolin, tile, silica, graphite, coke, coal, brick, sawdust, waste oil, and used solvents.	TSS, pH, COD, oil and grease, aluminum, lead, zinc.
Material Handling at Clay Products Manufacturing Facilities Including: Loading/Unloading.	Exposed: ceramic parts, liquid chemicals, ammonia, waste oil, used solvents, pryophyllite ore, shale, ball clay, fire clay, kaolin, tile, alumina, silica, graphite, coke, coal, olivine, magnesite magnesium carbonate, brick, sawdust, and wooden pallets.	TSS, pH, oil and grease, TKN, COD, BOD, aluminum, lead, zinc.
Forming/Drying Clay Products	Clay, shale, slag, cement, and lime	TSS, pH.
Material Storage at Cement Manufacturing Facilities.	Exposed: kiln dust, limestone, shale, coal, clinker, gypsum, clay, slag, and sand.	TSS, pH, COD, potassium, sulfate.
Material Handling at Cement Manufacturing Facilities.	Exposed: kiln dust, limestone, shale, coal, clinker, gypsum, clay, slag, anhydrite, and sand.	TSS, pH, COD, potassium, sulfate, oil and grease.
Crushing/Grinding at Cement Manufacturing Facilities.	Settled dust and ground limestone, cement, oyster shell, chalk, and clinker.	TSS, pH.
Material Storage at Concrete Product Manufacturing Facilities.	Exposed: aggregate (sand and gravel), concrete, shale, clay, limestone, slate, slag, and pumice.	TSS, COD, pH.

[41] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings.

TABLE E–1.—POTENTIAL SOURCES OF POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH GLASS, CLAY, CEMENT, CONCRETE, AND GYPSUM MANUFACTURING—Continued

Activity	Pollutant source	Pollutants/indicators
Material Handling at Concrete Product Manufacturing Facilities.	Exposed: aggregate, concrete, shale, clay, slate, slag, pumice, and limestone as well as spills or leaks of cement, fly ash, admixtures and baghouse settled dust.	TSS, COD, pH, lead, iron, zinc.
Mixing Concrete	Spilled: aggregate, cement, and admixture	TSS, pH, COD, lead, iron zinc.
Casting/Forming Concrete Products	Concrete, aggregate, form release agents, reinforcing steel, latex sealants, and bitumastic coatings.	TSS, pH, oil and grease, COD, BOD.
Vehicle and Equipment Washing at Concrete Product Manufacturing Facilities.	Residual: aggregate, concrete, admixture, oil and grease	TSS, pH, COD, oil and grease.
Crushing/Grinding of Gypsum Rock	Exposed or spilled: gypsum rock and dust	TSS, pH.
Material Storage at Gypsum Manufacturing Facilities.	Exposed: gypsum rock, synthetic gypsum, recycled gypsum and wallboard, stucco, perlite ore/expanded perlite, and coal.	TSS, COD, pH.
Material Handling at Gypsum Manufacturing Facilities (including bagging and packaging).	Exposed or spilled: gypsum rock, synthetic gypsum, recycled gypsum and wallboard, stucco, perlite ore/expanded perlite, and coal.	TSS, pH, COD.
Equipment/Vehicle Maintenance	Gasoline, diesel, fuel, and fuel oil	Oil and grease, BOD, COD.
	Parts cleaning	COD, BOD, oil and grease, pH.
	Waste disposal of solvents, oily rags, oil and gas filters, batteries, coolants, and degreasers.	Oil and grease, lead, iron, zinc, aluminum, COD, pH.
	Fluid replacement including lubricating fluids, hydraulic fluid, oil, transmission fluid, radiator fluids, solvents, and grease.	Oil and grease, arsenic, lead, cadmium, chromium, COD, and benzene.

The activities common to the facilities covered under Part XI.E. of today's permit are material storage and material handling operations. All facilities covered under this section handle and store nonmetallic minerals. These minerals are typically loaded and unloaded in areas of the site that are exposed to storm water. The minerals are often stored outdoors until they are utilized in the industrial processes. Handling and storing these minerals outdoors may result in the discharge of a portion of the materials in storm water runoff. The presence of the nonmetallic minerals in the storm water is measured by the total suspended solids (TSS) test. Many of the minerals processed by the facilities are calcareous, such as limestone or chalk. The presence of these materials can elevate the pH of the storm water discharged from the site.

Vehicle fueling, repair, maintenance and cleaning occurs at many facilities covered under this section. Facilities will fuel, repair and maintain vehicles used to transport significant materials to, from or around the facility. Facilities may also perform maintenance on process or material handling equipment such as mixers or conveyors. The fueling, maintenance and repair activities may result in leaks or spills of oil from the vehicles and equipment. The spilled material may be carried off of the site in the storm water discharge.

Ready mix concrete facilities will frequently wash out the mixers of the trucks after concrete has been delivered to a job site. The wash out water contains unhardened concrete. Facilities will often wash down the exterior of their vehicles. The wash off water may contain cement, sand, gravel, clay, or other materials. The wash water from the vehicles should be either treated and discharged from the site through a sanitary sewer or NPDES permitted discharge or collected in a recycle pond where the heavy solids settle out and the water is recycled back to be used in the plant. Pollutants from the wash water may settle out on the site before it is treated or recycled. These pollutants may come into contact with storm water and be discharged from the site.

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the glass, clay, cement concrete and gypsum product industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: manufacturers of flat glass, glass and glassware, pressed or blown glass products made of purchased glass; hydraulic cement manufacturers; manufacturers of clay products, pottery and related products (including nonclay refractories); and concrete, gypsum and plaster product manufacturers (including ground minerals and earth). Tables E–2, E–3, E–4 and E–5 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also list those parameters that EPA has determined merit further monitoring.

TABLE E–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY FLAT GLASS, GLASS AND GLASSWARE, PRESSED OR BLOWN GLASS PRODUCTS MADE OF PURCHASED GLASS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	9	9	17	17	9.4	7.76	0.0	0.0	45.0	16.0	5.0	7.0	27.8	17.56	49.5	25.01
COD	9	9	17	17	84.6	95.81	14.0	7.0	317.0	512.0	56.0	51.0	245.3	307.6	440.7	605.3
Nitrate + Nitrite Nitrogen	9	9	17	17	0.99	0.87	0.00	0.0	7.21	4.79	0.56	0.55	2.76	3.01	5.23	6.20
Total Kjeldahl Nitrogen	9	9	17	17	2.01	1.73	0.67	0.0	4.92	4.47	1.50	1.80	4.42	4.44	6.58	6.82
Oil & Grease	9	N/A	16	N/A	2.7	N/A	0.0	N/A	29.0	N/A	0.0	N/A	15.4	N/A	49.5	N/A
pH	9	N/A	18	N/A	N/A	N/A	4.6	N/A	9.8	N/A	7.9	N/A	10.5	N/A	11.8	N/A
Total Phosphorus	9	9	17	17	0.39	0.31	0.10	0.0	1.50	0.83	0.33	0.23	0.91	0.71	1.43	1.06

TABLE E–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY FLAT GLASS, GLASS AND GLASSWARE, PRESSED OR BLOWN GLASS PRODUCTS MADE OF PURCHASED GLASS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)—Continued

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
Total Suspended Solids	9	9	17	17	60	110.6	6	0.0	230	800	40	19.0	215	450	453	1314

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE E–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY HYDRAULIC CEMENT MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	4	4	7	7	7.8	5.3	0.0	0.0	40.2	27.0	0.0	0.0	42.5	27.99	95.2	60.6
COD	4	4	7	7	277.3	55.2	0.0	15.0	1411.0	136.0	38.8	40.0	1350.7	173.0	4198.2	323.1
Nitrate + Nitrite Nitrogen	4	4	7	7	0.78	3.40	0.23	0.10	1.77	17.5	0.66	0.67	1.82	15.44	2.75	49.7
Total Kjeldahl Nitrogen	4	4	7	7	1.85	1.16	0.00	0.0	7.15	2.81	0.56	1.03	12.77	5.20	41.07	11.15
Oil & Grease ...	4	N/A	7	N/A	1.5	N/A	0.0	N/A	5.0	N/A	0.0	N/A	9.6	N/A	22.8	N/A
pH	4	N/A	6	N/A	N/A	N/A	7.2	N/A	11.2	N/A	8.1	N/A	12.3	N/A	14.2	N/A
Total Phosphorus	4	4	7	7	1.00	0.18	0.00	0.01	3.88	0.53	0.16	0.05	18.43	1.14	143.86	3.72
Total Suspended Solids	4	4	7	7	2528	300.6	10	6.0	17085	1368	82	57	7499	1709	40323	6791

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE E–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY STRUCTURAL CLAY PRODUCTS, POTTERY, AND RELATED PRODUCTS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp-	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	18	18	23	22	10.4	10.7	0.0	0.0	47.0	42.0	9.3	9.1	30.2	32.3	50.2	54.32
COD	18	18	23	22	91.1	77.9	0.0	0.0	620.0	420.0	39.0	37.5	324.3	273.7	703.1	592.4
Nitrate + Nitrite Nitrogen	16	16	21	20	0.76	0.76	0.00	0.00	1.80	2.30	0.40	0.56	2.53	2.20	4.65	3.75
Total Kjeldahl Nitrogen	18	18	23	22	1.93	1.40	0.00	0.00	13.00	6.70	1.10	0.82	6.02	4.94	10.59	9.06
Oil & Grease	18	N/A	23	N/A	1.46	N/A	0.00	N/A	9.0	N/A	0.0	N/A	7.9	N/A	17.6	N/A
pH	18	N/A	23	N/A	N/A	N/A	5.0	N/A	9.0	N/A	7.0	N/A	9.2	N/A	10.1	N/A
Total Phosphorus	16	16	21	20	0.31	0.28	0.00	0.0	1.70	1.42	0.12	0.14	1.22	1.14	2.75	2.43
Total Suspended Solids	18	18	23	22	177	203	4	0.0	1300	1440	73	50	747	1065	2055	3745
Aluminum	8	8	8	8	3.96	6.48	0.3	0	14	42	2.7	1.1	16.51	24.18	37.73	74.09

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE E–5.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY CONCRETE, GYPSUM AND PLASTER PRODUCTS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	155	153	211	207	14.0	5.84	0.0	0.0	1300.0	74.0	4.0	3.4	33.5	19.4	71.0	35.9
COD	156	154	213	208	81.6	62.4	0.0	0.0	700.0	510.0	51.0	43.5	251.6	190.8	472.7	350.6
Nitrate + Nitrite Nitrogen	147	145	203	198	1.27	0.85	0.00	0.0	48.00	22.20	0.57	0.52	4.16	2.91	9.45	6.05
Total Kjeldahl Nitrogen	147	144	204	198	2.45	1.39	0.00	0.0	101.00	17.30	1.20	1.00	6.21	3.91	12.08	6.87
Oil & Grease	157	N/A	214	N/A	4.6	N/A	0.0	N/A	130.0	N/A	1.4	N/A	15.5	N/A	34.5	N/A
pH	148	N/A	199	N/A	N/A	N/A	2.0	N/A	12.3	N/A	8.9	N/A	12.1	N/A	13.8	N/A
Total Phosphorus	156	153	213	207	1.00	0.74	0.00	0.00	18.00	10.70	0.30	0.25	3.54	2.60	9.61	6.51
Total Suspended Solids	154	154	211	208	1322	374.5	0	0.0	61000	3340	250	170	3872	1724	12482	4636
Iron	8	8	8	8	10.4	7.1	0.2	1	29	14	5.4	6.5	72.2	23.1	224.3	41.9

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

There are a number of options for eliminating or minimizing the presence of pollutants in storm water discharges from glass, clay, cement or concrete product manufacturing facilities. In evaluating the options for controlling pollutants in the storm water discharges associated with the industrial activities

covered under this section, EPA must comply with the requirements of Section 402(p)(3) of the Clean Water Act which require the compliance with the Best Available Technology (BAT) and Best Conventional Technology (BCT).

EPA believes that it is infeasible to develop effluent limitations for storm water discharges associated with glass, clay, cement, or concrete manufacturing beyond those already established in the Effluent Limitation Guidelines. There are significant variations from site to site on the industrial activity and significant materials exposed to storm water. The data collected to date is inadequate to characterize these variations. Therefore, EPA believes that the requirement for a facility operator to develop a pollution prevention plan which considers the specific conditions at his or her site satisfies the BAT/BCT requirements. The pollution prevention plan will call for the implementation of best management practices that minimize contact between the storm water and pollutant sources or which remove pollutants from the storm water before it is discharged from the site. Table E–6 lists the pollution prevention measures or best management practices which are most applicable to facilities classified in major SIC Group 32. The table is organized by the specific industrial activities which may introduce pollutants to storm water. The right column lists corresponding BMPs which may be considered.

TABLE E–6.—MEASURES TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES FROM GLASS, CLAY, CEMENT, CONCRETE, AND GYPSUM FACILITIES[1]

Activity	Associated BMPs
Storing dry bulk materials including: sand, gravel, clay, cement, fly ash, kiln dust, and gypsum.	Store materials in an enclosed silo or building.
	Cover material storage piles with a tarp or awning.
	Divert runon around storage areas using curbs, dikes, diversion swales or positive drainage away from the storage piles.
	Install sediment basins, silt fence, vegetated filter strips, or other sediment removal measures downstream/downslope.
	Only store washed sand and gravel outdoors.
Handling bulk materials including: sand, gravel, clay, cement, fly ash, kiln dust, and gypsum.	Use dust collection systems (e.g., bag houses) to collect airborne particles generated as a result of handling operations.
	Remove spilled material and settled dust from paved portions of the facility by shoveling and sweeping on a regular basis.
	Periodically clean material handling equipment and vehicles to remove accumulated dust and residue.
	Install sediment basins, silt fence, vegetated filter strips, or other sediment removal measures downstream/downslope.
Mixing operations	Use dust collection systems (e.g., bag houses) to collect airborne particles generated as a result of mixing operations.
	Remove spilled material and settled dust from the mixing area by shoveling and sweeping on a regular basis.
	Clean exposed mixing equipment after mixing operations are complete.
	Install sediment basins, silt fence, vegetated filter strips, or other sediment removal measures downstream/downslope.
Vehicle and equipment washing	Designate vehicle and equipment wash areas that drain to recycle ponds or process wastewater treatment systems.
	Train employees on proper procedure for washing vehicles and equipment including a discussion of the appropriate location for vehicle washing.
	Conduct vehicle washing operation indoors or in a covered area.
	Clean wash water residue from portions of the site that drain to storm water discharges.
Dust Collection	Maintain dust collection system and baghouse. Properly remove and recycle or dispose of collected dust to minimize exposure of collected dust to.
Pouring and curing pre-cast concrete products	Pour and cure precast products in a covered area.
	Clean forms before storing outdoors.

[1] From "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," (EPA 832–R–92–006) EPA, 1992, and proposed pollution prevention plans submitted by group applicants.

In addition to the activity-specific best management practices listed in Table E–6 above, there are structural practices that may be effective in reducing the pollutants found in the storm water discharges from facilities in Major SIC Group 32. This section does not specifically require that these structural measures be installed; however, the permittee must consider measures such as these at the facility. The structural measures include: vegetative filter strips, grassed swales, detention ponds, retention ponds or recycle ponds. These structural measures remove pollutants from the storm water which is carrying them off site. The measures listed above are effective in removing the heavy suspended solids which are common in the storm water discharges from clay, cement, concrete, and gypsum facilities.

Vegetated filter strips are gently sloped areas covered with either natural or planted vegetation. Vegetated filter strips remove pollutants from storm water by a filtering action. Vegetated filter strips can be located along the down slope perimeter of the industrial activity but not in areas of concentrated flow. Grassed swales are similar to vegetated filter strips. Within Major SIC Group 32, four percent of the designated sampling facilities indicated in their part 1 group applications that they had vegetated filter strips at their facilities. Grassed swales also remove pollutants from storm water flows by a filtering action. A grassed swale consists of a broad, grass lined ditch or swale with gradual slopes or check dams to reduce the velocity of flow. Unlike vegetated filter strips, grassed swales can remove pollutants from concentrated storm water runoff. Over 13 percent of the

designated samplers in Major SIC Group 32 indicated that there were grass lined swales at their facility.

Retention ponds and detention ponds are storm water management measures used to control the quantity and quality of storm water discharged from a site. A detention pond is a pond which temporarily detains the storm water discharged from an area. While detained in the pond, the heavy suspended particles in the storm water settle to the bottom of the pond. The result is a discharge from the detention pond with a TSS concentration which is lower than the influent concentration to the pond. Retention ponds retain the storm water within the pond with no discharge except for when extreme rainfall events occur. The water collected in the retention pond either evaporates, infiltrates, or is used as process water on site. Twenty seven percent of the designated samplers in Major SIC Group 32 indicated that there was a pond on their site which was used as a storm water management measure.

4. Special Conditions

a. Prohibition of Non-storm Water Discharges. The prohibited non-storm water discharges under this section are the same as those described under section V1.B.2 of this fact sheet with one exception. Part XI.E.2. of today's permit clarifies that the discharges of pavement washwaters from facilities covered under Part XI.E. of the permit are authorized under this section after the accumulated fly ash, cement, aggregate, kiln dust, clay, concrete or other dry significant materials handled at the facility have been removed from the pavement by sweeping, vacuuming, combination thereof or other equivalent measures, or the washwaters are conveyed into a BMP designed to remove solids prior to discharge, such as sediments basins, retention basins, and other equivalent measures. Where practicable pavement washwater shall be directed to process wastewater treatment or recycling systems. The clarification is made for this sector because EPA believes that a primary source of pollutants in the storm water discharges from facilities covered under this sector are spilled materials or settled dust from material handling processes. A primary focus of the pollution prevention plan requirements for these industries are good housekeeping measures, in particular, sweeping the paved portions of the site surrounding the material handling areas. Washing the paved areas without first sweeping or otherwise removing the accumulated solids may result in the discharge of these pollutants in the washwater unless the washwater is contained onsite or otherwise collected without discharge.

5. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan.

(1) Description of Potential Pollutant Sources. All facilities covered by today's permit must prepare a description of the potential pollutant sources at the facility which complies with the common requirements described in Part VI.C.2. of this fact sheet. In addition to these requirements, facilities covered by this section must provide the following additional information in their pollution prevention plan.

Facilities covered under Part XI.E. of today's permit must identify on the site map the location of any: bag house or other air pollution control device; any sedimentation or process waste water recycling pond and the areas which drain to the pond. The location of the bag house or air pollution control equipment is required because this equipment stores the particulates or dust that are removed from the air in and around the material handling equipment. There is a potential that the collected dust or particulates could come into contact with storm water. Therefore the site map must indicate the location of this potential source. The site map for the facility must clearly indicate the portion of the facility which drains to sedimentation or recycle ponds that receive process wastewater. This information is necessary to illustrate the portion of the site where runoff is already controlled. The site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map. The site map for these facilities must also indicate the portion of the site where regular sweeping or other equivalent good housekeeping measures will be implemented to prevent the accumulation of spilled materials or settled dust.

(2) Measures and Controls. Part VI.C.3. of today's fact sheet describes a number of measures and controls which are effective in controlling the discharge of pollutants in storm water discharged from a number of types of industrial activities including those facilities in Major SIC Group 32. The following section describes BMPs which EPA believes are particularly effective in controlling the pollutants discharged from glass, clay, cement, concrete or gypsum manufacturing facilities. Facilities covered under Part XI.E. are required to consider each of these BMPs or its equivalent in their pollution prevention plan.

(a) Good Housekeeping—Today's permit requires that the pollution prevention plans for facilities covered under this section must specifically address measures to minimize the discharge of spilled cement, sand, kiln dust, fly ash, settled dust or other significant materials in storm water from paved portions of the site that are exposed to storm water. Measures used to minimize the presence of these materials may include regular sweeping, or other equivalent measures. The plan shall indicate the frequency of sweeping or other measures. The frequency shall be determined based upon consideration of the amount of industrial activity occurring in the area and frequency of precipitation. This requirement is established in an effort to minimize the discharge of solids from these types of facilities. Sweeping to prevent the discharge of solids must be considered in the pollution prevention plan because it is a cost effective measure well suited to the dry, granular, and powder-like materials used at the facilities covered under this section.

This section also requires that facilities minimize the exposure of fine solids such as cement, fly ash, baghouse dust, and kiln dust to storm water. The pollution prevention plan shall consider storing these materials in enclosed silos, hoppers, or other containers, in buildings, or in covered areas of the facility. Fine solids are a particular concern because the small particles are readily suspended by storm water and carried off of the site.

(b) Preventative Maintenance—There are no additional preventative maintenance requirements beyond these described in Part VI.C.3 of this fact sheet.

(c) Spill Prevention and Response—There are no additional spill prevention and response requirements for facilities in the glass, clay, cement, concrete or gypsum products industries beyond those described in Part VI.C.3.c. of this fact sheet.

(d) Inspections—Facilities in the glass, clay, cement, concrete, and gypsum products industries are required to conduct self inspections at a frequency which they determine to be adequate to ensure proper implementation of their pollution prevention plan, but not less frequently than once per month. Monthly inspections are necessary for the facility to be able to assess the effectiveness of

the pollution prevention plan. Less frequent inspections may allow facilities to delay inspections until after periods of high activity when the greatest potential for exposure of materials occurs. This section requires that the inspections take place while the facility is in operation because this is the only time when potential pollutant sources (such as malfunctioning dust control equipment or non-storm water discharges from equipment washing operations) may be evident. The inspectors must observe several portions of the site which EPA believes are potential sources of pollutants in storm water including: material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, vehicle washing, and equipment cleaning areas.

(e) Employee Training—In addition to the requirements described in Part VI.C.3.e. of this fact sheet, the pollution prevention plan training requirements for facilities in the glass, clay, cement, concrete, and gypsum industries require that the employee training program address procedures for equipment and vehicle washing. This is because these are common activities in these industries which result in process wastewater which may be discharged into the storm water conveyance system. Training programs should focus on where and how equipment should be cleaned at the facility so that there will be no unpermitted discharge of wash water to the storm water conveyance system. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to the storm water pollution prevention plan.

(f) Recordkeeping and Internal Reporting Procedures—There are no additional recordkeeping and internal reporting procedure requirements for facilities in the stone, clay, glass or concrete products industries beyond than those described in Part VI.C.3.f. of this fact sheet.

(g) Non-storm Water Discharges—There are no additional non-storm water discharge certification requirements for facilities in the stone, clay, glass or concrete products industries beyond those described in Part VI.C.2.d. of this fact sheet with the exception of facilities engaged in production of concrete products. These facilities must include in the certification a description of measures which insure that process wastewater which results from washing of trucks, mixers, transport buckets, forms or other equipment are discharged in accordance with NPDES requirements or are recycled. These nonprocess wastewater discharges are common to this industry. However, these discharges are not eligible for coverage under this section and it is necessary to assess the facility for the presence of these discharges so that steps may be taken to eliminate the discharges or to cover the process discharges with a separate permit.

A number of facilities in the concrete products industry maintain wash water recycle/retention ponds which receive the process wastewater from equipment cleaning and other operations. These ponds may also receive a portion or all of the runoff from the industrial site. These facilities are required to provide an estimate of the depth of the 24-hour duration storm event that would be required to cause the recycle/retention pond to overflow and discharge to the waters of the United States. Methods to make this estimate can include, but are not limited to, the original design calculations for the recycle/retention pond or historical observation.

(h) Sediment and Erosion Control—There are no additional sediment and erosion control requirements for facilities in the stone, clay, glass, or concrete products industries beyond those described in Part VI.C.3.g. of this fact sheet.

(i) Management of Runoff—There are no additional requirements for management of runoff at facilities in the stone, clay, glass, or concrete products industries beyond than those described in Part VI.C.3.h. of this fact sheet.

(3) Comprehensive Site Compliance Evaluation. Facilities in the glass, clay, cement, concrete, and gypsum product sector must perform an annual site compliance evaluation as described in Part VI.C.4. of this fact sheet. For facilities in the concrete product manufacturing industries, the evaluation must specifically address the following portions of the site: above ground storage tanks, hoppers or silos; dust collection/containment systems; truck wash down; and equipment cleaning areas. Because these areas are the most likely sources of pollutants, these portions of the site must be thoroughly evaluated.

6. Numeric Effluent Limitations

Part XI.E.4. of today's permit establishes numeric effluent limitations for storm water discharges from storage areas for materials used or produced at cement manufacturing facilities. Discharges from these areas may not exceed a maximum TSS concentration of 50 mg/L. The pH of the discharges from these areas must be within the range of 6.0 to 9.0. Untreated discharges from the facility which are a result of a storm with a rainfall depth greater than the 10-year, 24-hour storm event are not subject to this limitation. These effluent limitations are in accordance with 40 CFR 411.32 and 40 CFR 411.37. Effluent Guidelines and Standards, Cement Manufacturing Point Source Category, Materials Storage Piles Runoff Subcategory. These limitations represent the degree of effluent reduction attainable by the application of best practicable control technology and best conventional pollutant control technology. Dischargers subject to these numeric effluent limitations must be in compliance with the limits upon commencement of and for the entire term of this permit. Discharges that are associated with industrial activities that do not contain runoff from material storage areas at cement manufacturing facilities are not subject to the effluent limitation described above.

7. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that glass, clay, cement, concrete, and gypsum product manufacturing may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan, requires two of the four subsectors within the glass, clay, cement, concrete and gypsum product manufacturing sector to perform analytical monitoring.

The clay product subsector includes brick and structural clay tile manufacturers (SIC 3251), ceramic wall and floor tile manufacturers (SIC 3253), clay refractories (SIC 3255), manufacturers of structural clay products, not elsewhere classified (SIC 3259), manufacturers of vitreous china table and kitchen articles (SIC 3232), manufacturers of fine earthenware table and kitchen articles (SIC 3263), manufacturers of porcelain electrical supplies (SIC 3264), pottery products (SIC 3269) and non-clay refractories (3297). Data submitted by group applicants within this subsector show that a significant portion of the facilities discharge aluminum concentrations higher than bench mark values. Therefore facilities with these industrial activities must monitor for the pollutant identified in Table E–7.

The concrete and gypsum subsector includes concrete block and brick manufacturers (SIC 3271), concrete

products manufacturers (SIC 3272), ready mix concrete manufacturers (SIC 3273), gypsum product manufacturers (SIC 3275) and manufacturers of mineral and earth products (SIC 3295). Data submitted by group applicants within this subsector show that a significant portion of the facilities discharge total suspended solids and iron in concentrations higher than bench mark values. Therefore facilities with these industrial activities must monitor for pollutants identified in Table E–8.

The glass product subsector includes flat glass manufacturers (SIC 3211), glass container manufacturers (SIC 3221), pressed and blown glass and glassware manufacturer (SIC 3229), and manufacturers of glass products made of purchased glass (SIC 3231). Monitoring data submitted by facilities within this subsector do not indicate that these facilities are likely to discharge storm water with pollutant concentrations greater than the bench marks. Therefore, this sector is not subject to analytical monitoring requirements under this permit.

The cement manufacturing subsector includes manufacturers of hydraulic cement (SIC 3241). This subsector is not subject to the analytical monitoring requirements under Section XI.E.5.a this permit. However, because these facilities are subject to numerical effluent limitations they are subject to compliance monitoring described in section XI.E.5.d of the permit.

At a minimum, storm water discharges from clay and gypsum, and concrete product manufacturing must be monitored quarterly (January through March, April through June, July through September and October through December) during the second year of permit coverage. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Tables E–7 and E–8. If the permittee collects more than four samples in this period, then they must calculate an average concentration for all parameters analyzed, not simply a minimum of four selected analysis.

TABLE E–7.—CLAY PRODUCT INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Aluminum	0.75 mg/L.

TABLE E–8.—CONCRETE AND GYPSUM PRODUCT INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Suspended Solids (TSS) ...	100 mg/L.
Total Recoverable Iron	1.0 mg/L.

If the average concentration for a parameter is less than or equal to the value listed in Tables E–7 or E–8, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Tables E–7 or E–8, then the permittee is required to conduct quarterly (in the same quarterly periods listed above) monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit.

TABLE E–9.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table E–7 or E–8, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table E–7 or E–8, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table E–7 or E–8. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, there are monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis, in lieu of sampling required under Part XI E.5 of today's permit, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports required under Part XI E.5.b. The permittee is required to

complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained.

This certification is not to be confused with the low concentration sampling waiver. The test for the application of this certification is whether the pollutant is exposed, or can be expected to be present in the storm water discharge. If the facility does not and has not used a parameter, or if exposure is eliminated and no significant materials remain, then the facility can exercise this certification. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (*b*) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)) shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of storm water discharges from each outfall are required. Note that this requirement applies to all facilities and not just those subject to the analytical monitoring requirements under Part VI.E.7. of this fact sheet. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once every 3 months (January through March, April through June, July through September, and October through December) during permit coverage. Examinations shall be made during daylight unless there is insufficient rainfall or snow-melt to produce runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examination. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the monitoring period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

g. Compliance Monitoring Requirements. Today's permit requires permittees with discharges of runoff from material storage at cement manufacturing facilities to monitor for the presence of TSS and pH. These monitoring requirements are necessary to evaluate compliance with the numeric effluent limitation established for these discharges. Monitoring shall be performed upon a minimum of one grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. Monitoring results shall be submitted on Discharge Monitoring Report Form(s) postmarked no later than the 31st day of the month following collection of the sample. Facilities which discharge through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit signed copies of discharge monitoring reports to the operator of the municipal separate storm sewer system. Alternative Certification provisions described in Section VI.E.5 do not apply to facilities subject to compliance monitoring requirements in this section. Compliance monitoring is required at least annually for discharges subject to effluent limitations. Therefore, EPA cannot permit a facility to waive compliance monitoring.

F. Storm Water Discharges Associated With Industrial Activity From Primary Metals Facilities

1. Discharges Covered Under This Section

On November 16, 1990 (55 FR 47990), the U.S. Environmental Protection Agency (EPA) promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from 11 categories of industrial facilities. This section of today's permit includes storm water discharges associated with industrial activity from primary metals facilities. These facilities are commonly identified by Standard Industrial Classification (SIC) code 33. The SIC codes eligible for coverage under this section of today's permit include the following:

a. Steel works, blast furnaces, and rolling and finishing mills, including: steel wiredrawing and steel nails and spikes; cold-rolled steel sheet, strip, and bars; and steel pipes and tubes (SIC 331).

b. Iron and steel foundries, including: gray and ductile iron, malleable iron, steel investment, and steel foundries, not elsewhere classified (SIC 332).

c. Primary smelting and refining of nonferrous metals, including: primary smelting and refining of copper and primary production of aluminum (SIC 333).

d. Secondary smelting and refining of nonferrous metals (SIC 334).

e. Rolling, drawing, and extruding of nonferrous metals, including: rolling, drawing, and extruding of copper; aluminum extruded products; rolling, drawing, and extruding of nonferrous metals, except copper and aluminum; and drawing and insulating of nonferrous wire (SIC 335).

f. Nonferrous foundries (castings), including: aluminum die-castings, nonferrous die-castings, except aluminum, aluminum foundries, copper foundries, and nonferrous foundries, except copper and aluminum (SIC 336).

g. Miscellaneous primary metal products, not elsewhere classified, including metal heat treating (SIC 339).

Group applications were received from facilities representing each of the categories of industry eligible for coverage under this section. A large number of group applications also included facilities identified by other SIC codes. These facilities may be covered in whole, or in part, by other sections of today's permit. In other cases, SIC codes may have been assigned improperly. The special conditions reflected in this section of today's permit relate to specific operations taking place at a facility. These operations should be used as the basis for determining permit requirements appropriate for that particular facility.

Although there are many activities common to some or all of the facilities covered by this section, some of the operations discussed are unique to a particular industry group. Due to the broad range of activities conducted by facilities in this category, it would be impossible to identify all activities occurring at facilities covered by this section. This fact sheet attempts to describe the major activities representative of many of the facilities addressed by this section and provides examples of concerns associated with storm water discharges from primary metals facilities. All materials present and industrial activities taking place at a facility that have a potential impact on storm water discharges must be addressed by the facility's pollution prevention plan, whether or not the material or activity is specifically addressed by this section.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Industry Profile

Facilities in the primary metals industry conduct a wide range of activities. The SIC manual lists seven industry groups (three-digit SIC codes), and 27 industry numbers (four-digit SIC codes) within the sector. Of these, facilities representing 21 four-digit SIC codes submitted group applications.

Due to the large number of alternate processes available for many activities conducted within the primary metals industry it is very difficult to characterize "typical" facilities. Facilities within the same industry can employ quite dissimilar processes to arrive at a similar product. Differences can be found in the types of raw materials, furnaces or ovens, casting processes, the degree of mechanization, and any finishing operations which may be employed by a particular facility. Considerable differences can also be seen between facilities based on their customers needs. Some facilities may operate as a job shop, providing finished parts to other companies. Other facilities could conduct more limited operations and pass the product on to other facilities that provide finishing operations exclusively.

These differences in specific processes, as well as in the general scale and scope of individual operations can make facilities with the same or similar SIC codes quite different. Due to the difficulty in subdividing the industry into distinct facility types, the following

discussion briefly describes the full range of activities potentially employed by members of this industry. Despite the substantial diversity within the industry group, there are a number of general operations which characterize the majority of industrial processes.

Facilities in the primary metals industry are typically involved in one or more of the following general operations: raw material storage and handling; furnace and oven related processes; preparation of molds, casts, or dies; metal cleaning, treating and finishing; and waste handling and disposal.

a. Raw Material Storage and Handling Activities. Due to the nature of the primary metals industry, large quantities of raw materials are required for many operations. The extent to which these materials are stored outside exposed to precipitation will depend on the specific operations taking place at a facility, the size of the operation, as well as the storage space available that is covered. Some of the most common materials used are metals, fuels, fluxes, refractories, sand, and an assortment of solvents, acids, and other chemicals.

The primary raw material for all facilities in the industry is the source of metal to be used or processed. For steel works, smelters, and blast furnaces, the raw material could be metallic ores, scrap, dross, or foundry returns. Foundries may use scrap materials, borings, turnings, metal ingots, pigs or a mixture of these and other materials. Rolling mills, heat treaters, and metal finishing operations will generally use billets, slabs, blooms, bars, pigs or other cast metal pieces as their primary raw material. These may be produced at another part of the same facility, or purchased from another source. Some of these materials may arrive with protective or incidental coatings of oil, oxides, or other impurities. Due to the large size and volume of some of these materials they may be stored outside.

Energy sources for facilities within the industry are also quite varied. While steel mills with coking operations may use coal as the fuel for firing coke ovens, coal would also be the raw material that would be converted to coke. Some iron and steel foundries or mini-mills may use coke as a fuel only, or may use electric arc furnaces for melting. Smaller foundries (ferrous or nonferrous) may use gas-fired or electric induction furnaces.

A variety of fluxes are often added to the molten metal to allow impurities to be removed as slag or dross. In the iron and steel industry, limestone is probably the most common flux used. Others include dolomite, soda ash, fluorspar, and calcium carbide. Nonferrous operations may use other fluxing agents or none at all.

During the melting process, refractories are used to line and protect the furnaces. These refractories have limited lives and must be replaced periodically. The life of the refractory will depend on the type of furnace as well as the material being melted. Some large furnaces require almost constant patching of the refractory materials and thus large quantities may be stored for future use.

Another common material used in casting operations is sand. Many foundries will use sands of different types to produce the molds and cores for the production of castings. Although some facilities are able to recycle their sand, others must dispose of some or all of the used sand and thus require large amounts of fresh sand as a raw material. There are also a large number of sand additives and binders which may be used to control the properties of the mold produced. "Wet" sand may contain clay, seacoal, bentonite, wood flour, phenol, iron oxide, and numerous other acids and chemicals, some of which may be toxic.

Other processes related to finishing operations can require a wide variety of solvents, chemicals, and acids. Many facilities involved in cleaning, treating, painting, or other finishing operations may store these products in tanks or drums which may be exposed to precipitation.

b. Furnace, Rolling, and Finishing Operations. The majority of processes within the primary metals industry are conducted inside. These activities include all types of furnace operations, rolling operations, as well as all kinds of metal finishing activities. Many of these operations, however, generate significant quantities of particulate matter which, if not properly controlled, can result in exposure to precipitation.

There are many different types of furnaces. Each has advantages and limitations and are used for different types of metals. Facilities may use coal, coke, or gas fired furnaces as well as electric arc or induction furnaces.

Coke ovens, or batteries, generally use coal fired furnaces to heat coal in the absence of oxygen to drive off volatiles. The resultant product is coke which is subsequently used in other furnace operations. Blast furnaces are usually operated on a continuous basis with coke, iron ore, and fluxes charged at the top of a vertical shaft while molten pig iron and slag are tapped at different levels below.

Sintering plants burn coke breeze (particles too small to use for charging in cupola or blast furnaces) mixed with iron ore, flue dust, or other products to fuse them into materials that can then be charged with regular coke in a furnace. Cupola furnaces are used by ferrous foundries and operate in essentially the same manner as blast furnaces, allowing a range of scrap steel and iron to be charged with coke and fluxes at the top of the furnace.

Basic oxygen process furnaces use a mixture of molten iron and scrap as the charge. High-purity oxygen is injected into the furnace where it combines with impurities in the charge materials and provides heat to melt the charge of scrap.

There are two types of electric furnaces in use. Electric arc furnaces operate in a batch fashion and are often used by steel mini-mills. Scrap metal is placed in the furnace along with three electrodes which provide the energy to melt the charge. Electric induction furnaces are generally smaller than other types described above and require that cleaner metals be used.

Gas-fired furnaces are often used by nonferrous foundries. They are generally small and require relatively clean metals for melting.

One trait that all types of furnaces share is the generation of significant emissions, including particulate emissions. Blast furnaces, sintering plants, and cupola furnaces, all fired by coke, have particularly high particulate emissions. These furnaces are capable of handling a relatively "dirty" charge, with significant impurities which can lead to a variety of emissions problems. For these reasons, these types of furnaces will have emissions controls such as baghouses, wet scrubbers, or electrostatic precipitators. Electric arc furnaces are also able to melt fairly "dirty" scrap and can also have significant levels of particulate emissions.

At the other end of the spectrum are smaller electric induction and gas fired furnaces which generally require a very clean charge. Although this reduces the volume of emissions concerns significantly, they are also less likely to have as extensive pollution control and thus fugitive emissions of particulates may be significant.

The effectiveness of emissions control equipment in controlling particulate generation will depend on the furnace operation, the raw materials used, the type of control equipment in place, and the degree to which it is operating properly. Fugitive emissions, faulty or improperly maintained equipment, and "dirty" raw materials can all contribute to particulate emissions that may not be captured by pollution control

equipment, and may be exposed to precipitation.

Another category of operations are rolling, drawing, and extruding operations. Facilities involved in these operations will often use furnaces similar to those described above. The metal will often be heated, and then passed through a series of rollers which alter its' dimensions, making it longer, flatter, etc. This process generally involves large amounts of contact cooling water which can contain high levels of suspended solids and oil and grease.

c. Preparation of Molds, Pouring, Cooling, and Shakeout. Foundry operations and die-casters will generally prepare the molds, casts, or dies that will determine the ultimate shape of the product to be produced. There are a number of possible operations with significant differences between them. These include sand casting, investment casing, and die casting.

Sand casting operations involve a number of possible steps and a range of materials. Casts are shaped in two sections which form the outside of the part to be produced. Cores can also be used to form inner surfaces of the parts. A variety of sands may be used and can be combined with clay and a number of other additives to give the mold the desired properties. Once the casting has cooled, it is placed on a vibrating screen which shakes loose the majority of the sand. The casting is then ready for cleaning and finishing operations. At some facilities the used sand may be recycled or some or all of the sand may need to be disposed of and replaced.

Investment casting involves the formation of a wax replica of the part to be produced, usually in a metal die. A series of wax parts may be attached to a "tree." Once a tree is completed, it is coated with a ceramic cast in a series of dipping operations. The wax may then be removed from the cast in a furnace or the metal can be poured in directly. As in sand casting, the casting is allowed to cool before the cast is removed. A separate wax form and ceramic shell must be made for each part to be produced.

Die-castings employ a more direct route from molten metal to finished part. A metal die is produced and molten metal in injected under pressure into it. Once it has cooled, the casting is removed and is ready for finishing operations. Unlike sand casting or investment casting, the die can be used over and over to produce more parts.

Like most foundry operations, molds are generally prepared indoors. There are, however, particulate emissions associated with the pouring and cooling of molten metal.

d. Metal Cleaning, Treating, and Finishing. Almost all operations in the primary metals industry result in metal products which require some degree of finishing. The type of finishing activities undertaken depend on the material being treated, as well as the properties desired in the final part and can include both mechanical and chemical operations.

Castings generally come out of their molds with metal sprues and other imperfections which must be removed. This can be done through grinding, cutting, or blasting with sand, shot, or grit. Other possible operations include drilling, threading, or dimensioning. A combination of these operations is often necessary.

Some facilities such as rolling mills will use a descaling process to remove oxides and other residues which can form on the surfaces of metallic products. Typical operations include blasting with water or sand. This produces large quantities of scale and other particulate matter which may contain other residual products such as oil.

Heat treating is another operation which can involve furnaces for controlled heating and cooling of large quantities of metal. A variety of media may be used to cool metals at different rates. Oil, water, and liquid salt baths may all be used depending on the properties desired in the finished product. Acid pickling may be used to remove unwanted material from the surface of metal. Other cleaning and finishing operations may involve a wide range of solvents, acids, or other chemicals. All of these processes can generate toxic wastes in the form of sludges, particulates, or spent baths. In addition, residuals from these operations left on the metal surface may become exposed to storm water if materials are transported or stored outside.

e. Waste Handling and Disposal. Wastes are generated from numerous sources within the primary metals industry. Some types of waste are found at a majority of facilities while others may be specific to a particular activity. Some of the common waste products include used sand, cores, butts, refractory rubble, machining and finishing wastes, slag, dross, and collected particulates such as baghouse dust.

Sand casting operations which are not able to fully recycle their sand may generate large volumes of waste or "burnt" sand. "Wet" sands may contain any one of a number of additives, depending on the specific type of casting being produced. Other related wastes include the cores and butts used in the sand casing process.

Most casting operations will produce a product which requires some degree of machining and finishing. The wastes produced will depend mainly on the material being finished and whether a mechanical or chemical process is used. Machining waste can include fines, turnings, or cuttings as well as shot, grit, and scale from blasting operations. Chemical finishing can result in waste solvents, acids, and pickling sludges and baths which contain metal wastes.

The metal melting process results in the production of slag from ferrous, or dross from nonferrous materials. The content and volume of these wastes produced will vary depending on the charge material, and any fluxing agents or additives that may be used. In general, slag is produced in greater quantities and will be more likely to be stored outside, however there is the possibility of exposure of both types of waste to precipitation.

Particulate matter generated in furnaces and during machining is another source of waste with significant potential for storm water contamination. These waste streams may be segregated at larger facilities or combined, but the concerns are essentially the same. The dusts are collected in baghouses, electrostatic precipitators, wet scrubbers, or in cyclones and disposed of. If the pollution control equipment is inadequate, or not operating effectively, there is potential for storm water contamination from these types of waste.

3. Pollutants Found in Storm Water Discharges

Impacts caused by storm water discharges from primary metals facilities will vary. A number of factors will influence to what extent the activities at a particular facility will affect water quality. These include: geographic location, hydrogeology, the amounts and types of materials stored outside, the types of processes taking place outside, the size of the operation, as well as the characteristics of a particular storm event. These and other factors will interact to affect the quantity and quality of storm water runoff. For example, particulate emissions from furnaces or ovens may be a significant source of pollutants at some facilities, while outdoor material storage such as scrap piles may be a primary source at others. In addition, sources of pollution other than storm

water, such as illicit connections,[42] spills, and other improperly dumped materials, may contribute significant levels of pollutants into waters of the United States.

A summary of industrial activities conducted by primary metals facilities in the group application process is listed in Table F–1. The table also lists the sources of pollutants related to the activity and what the specific pollutants of concern are. The table is limited to those activities which are generally conducted outside, or that have potential to contribute pollutants to storm water discharges. Many processes in the primary metals industry are conducted inside and are therefore not represented in Table F–1.

TABLE F–1.—POLLUTANTS OF CONCERN FOR MAJOR ACTIVITIES WITHIN THE PRIMARY METALS INDUSTRY

Activity	Source	Pollutants
Raw material storage and handling .	Metal product stored outside such as foundry returns, scrap metal, turnings, fines, ingots, bars, pigs, wire.	Residual or protective Oil and Grease, Metals, TSS, COD, TSS.
	Outdoor storage or handling of fluxes	pH (limestone).
	Storage piles, bins, or material handling of coke or coal	TSS, pH, metals.
	Storage or handling of casting sand or refractory	TSS.
Vehicle Maintenance	Vehicle fueling and maintenance or outdoor storage tanks and drums of gas, diesel, kerosene, lubricants, solvents.	Oil and grease.
Waste materials—handling, storage, and disposal.	Slag or dross stored or disposed of outside in piles or drums	Metals, pH.
	Fly ash, particulate emissions, dust collector sludges and solids, baghouse waste.	TSS.
	Storage and disposal of waste sand or refractory rubble in piles outside.	TSS, metals, misc. "wet" sand additives.
	Machining waste—fines, turnings, oil, borings, gates, sprues, scale ..	TSS, metals, oil and grease.
	Obsolete equipment stored outside	Oil and grease.
	Landfilling or open pit disposal of wastes onsite	See Part VIII.L.
Furnace operations and pollution control equipment.	Losses during charging of coke ovens or sintering plants and from particulate emissions.	TSS, particulates, metals, volatiles, pH.
	Particulate emissions from blast furnaces, electric arc furnaces, induction furnaces.	TSS, metals.
	Fugitive emissions from poorly maintained or malfunctioning baghouses, scrubbers, electrostatic precipitators, cyclones.	TSS, metals.
	Wastewater treatment operations exposed to precipitation	See Part VIII.T.
Rolling, casting, and finishing operations.	Exposure of wastewater used for cooling or descaling related to rolling.	Oil and grease, pH, TSS, metals, COD.
	Storage of products outside after painting, pickling, or cleaning operations.	pH, solvents, metals.
	Casting cooling or shakeout exposed to precipitation or wind	TSS, metals.
	Losses of particulate matter from machining operations (grinding, drilling, boring, cutting) through deposition or storage of products outside.	Metals, TSS.
Plant yards	Areas of the facility with unstabilized soils subject to erosion	TSS.
Illicit discharges	Improper connection of floor, sink, or process wastewater drains	Dependent on source.

Although operations at primary metals facilities may vary considerably, the elements with potential impact on storm water discharges are fairly uniform and consistent. Facilities may include considerable areas of raw and waste material storage such as coal, coke, metal, ores, sand, scale, scrap, and slag. Processes generally involve furnaces for heating and melting metals or for producing coke, any of which may result in significant particulate emissions. Due to the nature of their operations some facilities will have large areas of exposed soil and heavy vehicle traffic which can lead to erosion.

a. Raw Material Storage and Handling Activities. Raw materials with potential effects on storm water discharges fall into a number of distinct categories.

Sands used for the production of molds or cores can contribute to TSS loadings. Piles of materials may be washed away directly, or spills and windblown losses may occur during handling and process related activities.

Metal raw materials can come in numerous forms including billet, slab, pig, bar. These materials have the potential to corrode which can result in the loss of metal to a solution, i.e., water. The following metals are referred to as the galvanic (or electromotive) series and have a tendency to corrode and become soluble in water; magnesium, aluminum, cadmium, zinc, steel or iron, cast iron, chromium, tin, lead, nickel, soft and silver solder, copper, stainless steel, silver, gold, platinum, brass and bronze. For some metals, the extent and rate of corrosion is dependent on whether it occurs in an oxygen-starved or oxygen-abundant atmosphere. If materials are coated in oil to prevent corrosion, or residual chemicals used to clean or treat the metal are present, these can also be a source of pollution easily picked up by storm water runoff.

Scrap metals come in a variety of forms including machining waste such as turnings, shavings, filings, borings or as post consumer waste in a variety of forms. These materials can contribute metals, oil and grease, suspended solids, and other pollutants to storm water

[42] Illicit connections are contributions of unpermitted non-storm water discharges into storm sewers from any number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings.

runoff depending on their makeup and origin.

Runoff related to storage and handling of coal and coke can contribute suspended solids, metals, as well as oil and grease to runoff. These can be released from piles, hoppers, or bins through handling or wind-blown losses. Significant losses can also occur during handling with conveyors, trucks, or while preparing charges for the furnace or sintering operations.

Fluxes such as limestone may be stored in piles, bins, or hoppers outside or become exposed to precipitation during unloading and handling activities. Limestone can increase the pH of storm water. Fluxes can also contribute to loadings of suspended solids (TSS) or have other effects depending on their makeup.

A variety of acids and solvents may be stored in drums or tanks for use in metal treating and cleaning operations. Leaks and spills from tanks and drums or during handling can result in discharges with storm water. These materials can affect pH of storm water and may be toxic.

b. Process Activities. Many processes can contribute pollutants to storm water discharges. These can include all types of furnaces, metal finishing activities, as well as material handling equipment.

Furnaces of all types can generate particulate emissions. The quantity and character of these emissions can vary greatly depending on the type of furnace, the material being melted, the fuel used, and any pollution control equipment that may be in place. In general, large coke-fired and electric arc furnaces capable of handling fairly dirty charge products will have higher emissions, but are also more likely to have sophisticated pollution control such as wet scrubbers, baghouses, and electrostatic precipitators. Smaller gas fired or electric induction furnaces generally require a fairly clean charge and have less emissions, but might also have less sophisticated controls. Settling of these emissions on roofs and plant yards are very likely to be washed away in storm water runoff. These particulates can contain a wide range of constituents which can contribute metals and suspended solids to discharges.

Material handling equipment such as conveyors, trucks, and forklifts can all contribute drippings of oil and grease as well as hydraulic fluids. This equipment may also generate or release particulate matter related to the materials being handled. Pallets, hoppers, drums, and storage bins may all contain residual materials which may become exposed to storm water.

Metal finishing operations can be divided in two general types. Mechanical operations such as grinding, blasting, boring, chipping, cutting, and descaling can all produce metal fines, chips, and turnings which may contribute metals and suspended solids to discharges. Residuals of oil or other materials on the finished goods or waste products can also contribute pollutants. Other finishing operations include acid pickling, solvent cleaning, and all types of heat treating activities. Materials that have been treated or finished may have residual chemicals on them such as pickling baths, oil or liquid salt quench media, or solvents. Exposure of these materials could contribute to pH, metals, or oil and grease in storm water discharges.

Stationary process equipment may also produce a substantial amount of residual particulate material that tends to accumulate on and around the equipment. Many materials used for primary metals production are conducive to this type of buildup. This will typically occur around rotating machinery, moving parts, bearings, conveyors and at the output of the equipment, e.g., storage containers. Particulate material that accumulates can become a source of contamination if it comes in contact with either precipitation or storm water runoff.

c. Waste Material Storage, Handling, and Disposal. Waste materials are generated in large volume from many of the facilities in this industry. These wastes can include used sand, cores and butts, refractories, slag and dross, baghouse or cyclone dusts, scrubber dusts and sludges, machining wastes, and obsolete equipment. There is potential for pollution from many of these sources if not properly stored, handled, and disposed of.

Used sands, cores, butts, and refractory rubble are all potential sources of TSS. Due to the large volumes potentially generated and their generally benign nature, these materials are often stored outside. The exposure of these materials to molten metal also presents the possibility of contamination with metals which may also get washed away with storm water.

Wastes related to pollution control equipment are particularly susceptible to being discharged with storm water if not properly controlled. These wastes could originate from baghouses, cyclones, electrostatic precipitators or scrubbers. These may be in place to control emissions from a large variety of ovens and furnaces, as well as mechanical or chemical metal finishing operations. These dusts and sludges typically contain an assortment of metals, metal oxides, and other particulate matter. The size of particulates that are able to be captured will vary from one type of equipment to the next and will depend on proper operation and maintenance.

Machining and finishing waste which is not collected as described above may also be generated in significant quantities. This material is typically metallic fines and particulate matter but may contain cutting oil or other materials as well. If stored outside in piles, drums, hoppers, or other containers these materials can contribute metals, TSS, or oil to precipitation and storm water runoff.

d. Erosion and Sediment Loss. Erosion from plant yards is another potential source of storm water contamination from primary metals facilities. Areas of vehicle traffic related to material handling, loading, unloading, material storage areas etc. may all have exposed soils with the potential for erosion. These soils can contribute to TSS loadings in storm water discharges. Exposed surfaces also limit the potential for housekeeping measures such as sweeping, making spills of other materials (particulate or liquid) harder to clean up and more likely to be washed away with storm water. The large size of many primary metals facilities makes this a concern. For example: one group application consists of 5 facilities with a total land area of 623 acres. Of this, approximately 105 acres (16.9 percent) were impervious surfaces (buildings, paved areas), leaving 83 percent of the total area potentially susceptible to erosion. Vehicle traffic, material handling, and storage activities taking place in unstabilized areas can all lead to erosion.

e. Group Application Monitoring Data. Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the primary metals industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: steel works, blast furnaces, and mills (SIC 331); iron and steel foundries (SIC 332); primary smelting and refining of nonferrous metals (SIC 333); secondary smelting and refining of nonferrous metals (SIC 334); nonferrous rolling and drawing (SIC 335); nonferrous foundries (SIC 336); and miscellaneous primary metals products (SIC 339). Tables F–2, F–3, F–4, and F–5 below include data for the eight pollutants that all facilities were required to monitor for under Form 2F.

The tables also list those parameters that EPA has determined may merit further monitoring. Tables are not included for primary smelting and refining of nonferrous metals manufacturing facilities; secondary smelting and refining of nonferrous metals manufacturing facilities; and miscellaneous primary metal products facilities subsectors because less than three facilities submitted data for each of these subsectors.

TABLE F–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY STEEL WORKS, BLAST FURNACES, AND ROLLING AND FINISHING MILLS SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	9	8	17	15	17.2	16.3	1.0	1.0	60.0	60.0	10.0	9.30	59.3	59.3	119.4	128.2
COD	9	8	17	15	100.2	74.7	19.0	9.0	340.0	235.0	62.0	55.0	287.9	215.4	514.6	380.6
Nitrate + Nitrite Nitrogen	9	8	16	14	2.01	1.41	0.08	0.09	15.30	9.5	0.51	0.40	7.03	4.62	18.5	11.6
Total Kjeldahl Nitrogen	9	8	17	15	1.81	1.32	0.00	0.64	4.30	2.7	1.60	1.10	4.17	2.29	6.15	2.96
Oil & Grease	9	N/A	17	N/A	3.1	N/A	0.0	N/A	16.4	N/A	2.0	N/A	9.9	N/A	18.4	N/A
pH	9	N/A	17	N/A	N/A	N/A	5.4	N/A	9.4	N/A	7.5	N/A	9.5	N/A	10.5	N/A
Total Phosphorus	9	8	17	15	0.51	0.28	0.01	0.02	2.26	0.80	0.42	0.20	2.89	1.08	8.55	2.29
Total Suspended Solids	9	8	17	15	173	82	0	0	866	717	66	39	1123	346	4141	1030
Aluminum	3	3	5	5	3.24	1.9	0.3	0.3	7.9	6	2.8	1.1	15.51	7.1	35.7	15.24
Zinc	7	6	14	11	1.556	1.208	0	0	16	9.3	0.29	0.37	5.471	5.73	16.48	19.445

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE F–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY IRON AND STEEL FOUNDRIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	31	30	64	56	35.8	57.6	0.0	0.0	1200.0	2500.0	11.0	10.0	79.8	64.0	176.7	133.2
COD	32	31	64	57	287.9	118.3	0.0	0.0	3600.0	640.0	108.5	76.0	1046.0	339.1	2731.7	605.9
Nitrate + Nitrite Nitrogen	31	30	64	56	0.77	0.86	0.00	0.02	5.90	4.50	0.58	0.62	2.17	3.02	3.84	6.03
Total Kjeldahl Nitrogen	31	30	64	57	3.50	3.18	0.00	0.0	30.00	24.0	2.00	1.81	11.05	9.84	21.84	18.7
Oil & Grease	31	N/A	64	N/A	6.5	N/A	0.0	N/A	140.0	N/A	0.0	N/A	24.1	N/A	69.3	N/A
pH	31	N/A	65	N/A	N/A	N/A	2.6	N/A	10.3	N/A	7.6	N/A	10.1	N/A	11.4	N/A
Total Phosphorus	31	30	65	57	1.79	0.40	0.00	0.00	76.00	4.00	0.28	0.22	3.67	1.65	10.33	3.73
Total Suspended Solids	31	30	65	57	594	228	0	1.0	6300	1200	138	123	2644	1000	8264	2417
Aluminum	4	4	11	11	5.99	5.38	0	0	20	21.4	4.49	3.3	47.24	17.51	141.97	33.1
Copper	27	26	57	50	7.919	5.155	0	0	210	140	0.08	0.04	6.629	3.362	31.253	15.875
Iron	4	3	8	7	9.2	10.1	0.2	0.4	26.3	30.4	8.6	8.1	62	54.5	170.5	134.8
Pyrene	3	3	4	4	.08	0.02	0	0	0.29	0.07	0.01	0	0.58	.....	2.37	.....
Zinc	29	28	62	54	18.35	14.395	0.01	0.047	430	330	0.57	0.46	23.162	14.843	96.353	52.671

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE F–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY ROLLING, DRAWING, AND EXTRUDING OF NONFERROUS METALS MANUFACTURING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	8	6	20	10	38.4	32.0	5.5	2.2	150.0	110.0	22.0	18.5	126.4	126.6	252.5	282.8
COD	8	8	20	20	138.9	80.6	0.0	0.0	495.0	230.0	93.5	50.8	480.5	269.3	950.7	503.5
Nitrate + Nitrite Nitrogen	7	7	19	19	1.75	3.71	0.10	0.30	5.61	19.1	1.60	1.80	7.58	11.8	16.76	24.52
Total Kjeldahl Nitrogen	8	8	20	20	4.71	6.45	0.34	0.0	30.00	42.0	2.95	1.65	15.68	19.77	32.73	48.67
Oil & Grease	8	N/A	20	N/A	2.5	N/A	0.0	N/A	20.0	N/A	1.1	N/A	8.2	N/A	15.9	N/A
pH	8	N/A	20	N/A	N/A	N/A	4.1	N/A	8.0	N/A	6.2	N/A	8.6	N/A	9.9	N/A
Total Phosphorus	8	8	20	20	0.12	0.10	0.00	0.0	0.50	0.30	0.09	0.06	0.38	0.31	0.68	0.56
Total Suspended Solids	8	8	20	20	45	58	0	0	429	310	7	8	182	310	531	1043
Copper	8	8	20	20	0.931	0.822	0	0	8.8	3.4	0.13	0.14	5.106	6.501	20.38	29.326
Zinc	8	8	20	20	0.525	0.417	0.021	0.04	2.3	1.9	0.3	0.3	1.806	1.189	3.637	2.085

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE F–5.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY NONFERROUS FOUNDRIES (CASTINGS) SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	14	14	30	27	14.7	12.8	0.0	3.0	51.0	47.0	10.5	8.0	38.6	29.6	63.1	46.3
COD	14	14	30	27	125.1	82.8	0.0	7.0	1400.0	510.0	50.5	32.0	390.9	260.1	907.0	535.7
Nitrate + Nitrite Nitrogen	13	13	28	25	0.99	0.85	0.00	0.00	3.60	2.08	0.74	0.77	2.80	2.12	4.64	3.32
Total Kjeldahl Nitrogen	13	13	28	25	2.29	2.17	0.15	0.58	22.00	9.70	1.30	1.40	6.34	5.08	12.06	8.19
Oil & Grease	14	N/A	30	N/A	4.2	N/A	0.0	N/A	47.0	N/A	0.5	N/A	16.7	N/A	35.5	N/A
pH	14	N/A	29	N/A	N/A	N/A	2.8	N/A	8.0	N/A	6.5	N/A	8.8	N/A	10.1	N/A
Total Phosphorus	14	14	30	26	0.26	0.13	0.00	0.0	1.50	0.96	0.07	0.05	1.17	0.52	3.26	1.26
Total Suspended Solids	14	14	29	26	145	111	0	0	2100	1100	20	37	536	563	1521	1761
Copper	14	14	30	27	0.494	0.672	0	0	4.2	7	0.26	0.2	1.861	2.532	4.122	6.122
Zinc	13	13	28	25	1.435	1.494	0	0	9.36	10.1	0.36	0.5	6.429	5.424	18.489	13.307

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

Although there are a wide range of pollutants which may be of concern for primary metals facilities, monitoring requirements for these facilities have been determined based on industry subgroups which exceed benchmarks for certain pollutants. As Tables F–2 through F–5 illustrate, there are a variety of pollutants which must be addressed at primary metals facilities.

4. Options for Controlling Pollutants

There are five main areas of concern related to primary metals facilities. These are raw material storage and handling; waste material storage, handling, and disposal; furnace, oven, and related pollution control activities; rolling, extruding, casting, and finishing operations; plant yards; and illicit connections.

Table F–6 summarizes the primary sources of pollution in each of these categories and potential Best Management Practices (BMPs) associated with each.

TABLE F–6.—POTENTIAL BEST MANAGEMENT PRACTICES FOR SOURCES WITHIN THE PRIMARY METALS INDUSTRY

Source	Potential best management practices
Metal product stored outside such as foundry returns, scrap metal, turnings, fines, ingots, bars, pigs, wire.	Store all wastes indoors or in sealed drums, covered dumpsters, etc.
	Minimize raw material storage through effective inventory control.
	Minimize runon from adjacent properties and stabilized areas to areas with exposed soil with diversion dikes, berms, curbing, concrete pads, etc.
Outdoor storage or handling of fluxes	Store fluxes in covered hoppers, silos, or indoors and protect from wind-blown losses.
	Stabilize areas surrounding storage and material handling areas and establish schedule for sweeping.
Storage piles, bins, or material handling of coke or coal.	Where possible store coke and coal under cover or indoors and protect from wind-blown losses.
	Prevent or divert runon from adjacent areas with swales, dikes, or curbs.
	Minimize quantities of coke or coal stored onsite through implementation of effective inventory control.
	Trap particulates originating in coke or coal storage or handling areas with filter fabric fences, gravel outlet protection, sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent.
Storage or handling of casting sand	Store raw sand in silos, covered hoppers, or indoor whenever possible.
	Prevent or divert runon from adjacent areas with swales, dikes, or curbs.
	Minimize quantities of sand stored onsite through implementation of effective inventory control.
	Tarp or otherwise cover piles.
	Trap particulates originating in coke or coal storage or handling areas with filter fabric fences, gravel outlet protection, sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent.
Vehicle fueling and maintenance	See Part VIII.P.
Outdoor storage tanks or drums of gas, diesel, kerosene, lubricants, solvents.	Store tanks and drums inside when possible.
	Establish regular inspection of all tanks and drums for leaks, spills, corrosion, damage, etc.
	Utilize effective inventory control to reduce the volume of chemicals stored onsite.
	Prevent runon to and runoff from tank and drum storage areas, provide adequate containment to hold spills and leaks.
	Prepare and train employees in dealing with spills and leaks properly, use dry clean-up methods when possible.
Slag or dross stored or disposed of outside in piles or drums.	Collect waste waters used for granulation of slag—these are not allowed under this section.
	Store slag and dross indoors, under cover, or in sealed containers.
	Establish regular disposal of slag or dross to minimize quantities stored and handled onsite.
	Minimize runon to slag storage areas with diversion dikes, berms, curbing, vegetated swales.
	Trap particulates originating in slag storage areas with filter fabric fences, gravel outlet protection, sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent.
Fly ash, particulate emissions, dust collector sludges and solids, baghouse dust.	Store all dusts and sludges indoors to prevent contact with storm water or losses due to wind.
	Establish regular disposal schedule to minimize quantities of pollutants stored and handled onsite.
Storage and disposal of waste sand or refractory rubble in piles outside.	Move piles under cover or tarps whenever possible.
	Establish regular disposal schedule to minimize quantities stored onsite.
	Stabilize areas of waste product storage and perform regular sweeping of area.
Scrap processing activities (shredding etc.)	See Part VIII.N.
Machining waste stored outside or exposed to storm water—fines, turnings, oil, borings, gates, sprues, scale.	Store all wastes indoors or in sealed drums, covered dumpsters, etc.
	Stabilize areas of waste product storage and perform regular sweeping and cleaning of any residues.

TABLE F–6.—POTENTIAL BEST MANAGEMENT PRACTICES FOR SOURCES WITHIN THE PRIMARY METALS INDUSTRY—Continued

Source	Potential best management practices
	Consider using booms, oil/water separators, sand filters, etc. for outfalls draining areas where oil is potentially present.
	Minimize runon from adjacent properties and stabilized areas to areas with exposed soil with diversion dikes, berms, curbing, concrete pads, etc.
Obsolete equipment stored outside	Where possible, dispose of unused equipment properly, or move indoors.
	Cover obsolete equipment with a tarp or roof.
	Consider using booms, oil/water separators, sand filters, etc. for outfalls draining areas where oil is potentially present.
	Minimize runoff coming into contact with old equipment through berms, curbs, or placement on a concrete pad.
Material losses from handling equipment such as conveyors, trucks, pallets, hoppers, etc.	Schedule frequent inspections of equipment for spills or leakage of fluids, oil, or fuel.
	Inspect for collection of particulate matter on and around equipment and clean. Where possible cover these areas to prevent losses to wind and precipitation.
	Store pallets, hoppers, etc. which have residual materials on them under cover, with tarps, or inside.
Losses during charging of coke ovens or sintering plants.	Cover any exposed areas related to furnace charging/material handling activities.
	Stabilize areas around all material handling areas and establish regular sweeping.
	Route runoff from particulate generating operations to sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent.
Particulate emissions from blast furnaces, electric arc furnaces, induction furnaces and fugitive emissions from poorly maintained or malfunctioning baghouses, scrubbers, electrostatic precipitators, cyclones.	Establish schedule for inspection and maintenance of all pollution control equipment—check for any particulate deposition from leaks, spills, or improper operation of equipment and remedy.
	Route runoff from particulate generating operations to sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent:
Storage of products outside after painting, pickling, or cleaning operations.	Store all materials inside or under cover whenever possible.
	Prevent runon to product storage areas through curbs, berms, dikes, etc.
	Consider using booms, oil/water separators, sand filters, etc. for outfalls draining areas where oil is potentially present.
	Remove residual chemicals from intermediate or finished products before storage or transport outside.
Casting cooling or shakeout operations exposed to precipitation or wind.	Perform all pouring, cooling, and shakeout operations indoors in areas with roof vents to trap fugitive particulate emissions.
	Recycle into process as much casting sand as possible.
Landfilling or open pit disposal of wastes onsite	See Part VIII.L.
Losses of particulate matter from machining operations (grinding, drilling, boring, cutting) through deposition or storage of products outside.	Store all intermediate and finished products inside or under cover.
	Consider using booms, oil/water separators, sand filters, etc. for outfalls draining areas where oil is potentially present.
	Clean products of residual materials before storage outside.
	Stabilize storage areas and establish sweeping schedule.
Areas of the facility with unstabilized soils subject to erosion.	Minimize runon from adjacent properties and stabilized areas to areas with exposed soil with diversion dikes, berms, vegetated swales, etc.
	Stabilize all high traffic areas including all vehicle entrances, exits, loading, unloading, and vehicle storage areas.
	Conduct periodic sweeping of all traffic areas.
	Trap sediment originating in unstabilized areas. Filter fabric fences, gravel outlet protection, sediment traps, vegetated swales, buffer strips of vegetation, catch-basin filters, retention/detention basins or equivalent.
	Inspect and maintain all BMPs on a regular basis.
	Provide employee training on proper installation and maintenance of sediment and erosion controls.
Improper connection of floor, sink, or process wastewater drains.	Inspect and test all floor, sink, and process wastewater drains for proper connection to sanitary sewer and remove any improper connections to storm sewer or waters of the United States.

5. Special Conditions

The following section identifies special conditions that are applicable to permittees applying for coverage under Part XI.F. of today's permit.

a. Prohibition of Non-storm Water Discharges. This section requires primary metals facilities to certify that certain non-storm water discharges are not occurring at their facilities. A list of common non-storm water discharges that are not authorized by this section has been identified. These discharges are prohibited due to the likelihood these discharges will contain substantial pollutant concentrations. This list is included in the permit only to add more specificity to the general non-storm water prohibition included in Part III.A. of the permit. The following non-storm water discharges are not authorized by this section: waste discharges to floor drains or sinks connected to the facilities storm sewer or storm drainage system; water originating from vehicle and equipment washing; steam cleaning wastewater; process wastewater; washwater originating from cleaning plant floor areas or material receiving areas; wastewater from wet scrubbers; boiler blowdown; contact or noncontact cooling water; discharges originating from dust control spray water;

discharges originating from the cleaning out of oil/water separators or sumps; discharges from bermed areas with a visible oily sheen or other visible signs of contamination; discharges resulting from casting cleaning or casting quench operations; discharges from slag quench or slag rinsing operations; and discharges from wet sand reclamation operations.

This final list of non-storm water discharges does not include discharges from oil/water separators and sumps, as was proposed. EPA intended to include only discharges originating from the cleaning or maintenance of these devices in this list.

The operators of non-storm water discharges must seek coverage under a separate NPDES permit if discharging to either a municipal separate storm sewer system or to waters of the United States.

6. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan. All facilities covered by this section must identify a pollution prevention team, prepare a description of all potential pollutant sources at the facility, and identify measures and controls appropriate for the facility. These items must comply with the common requirements described in Part VI.C. of this fact sheet. In addition to these requirements, facilities covered by Part XI.F. of today's permit must provide the following additional information in their pollution prevention plan.

(1) Description of Potential Pollutant Sources. Facilities must identify on the site map the location of any and all pollution control equipment such as baghouses, wet scrubbers, electrostatic precipitators, etc. as well as any uncontrolled stack emissions which may be located onsite. The site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map. Due to the hazardous nature of pollutants generated in this industry, and the potential for deposition of particulate matter from emissions, these emissions can be a significant contributor to pollutants at a facility and should be identified.

(2) Measures and Controls. There are typically five types of activity and materials present at facilities in the primary metals industry with potential impacts on storm water discharges. These have been discussed in today's fact sheet and include: raw materials storage and handling; process activities related to furnace operations, casting, rolling, and extruding; waste material storage, handling, and disposal; erosion from unstabilized plant areas; and illicit discharges, spills, and leaks. Each of these areas that is applicable to a facility must be identified in the pollution prevention plan and evaluated with regard to the BMPs discussed.

(a) Good Housekeeping—This section requires that facilities implement measures to limit the amount of spilled, settled, and leaked materials which are washed away by storm water. These materials include coal dust or coke breeze, metal fines from finishing operations, particulate emissions from furnaces and ovens, as well as dust and dirt from plant yards. In paved or other impervious areas sweeping is an easy and effective way to reduce these pollutants. Sweeping frequency should be determined based on the rates of accumulation of a particular material and its potential impact on storm water discharges. Where significant particulates are generated in unstabilized areas of the plant, other measures may be necessary.

The large number of particulate generating processes and the makeup of these pollutants makes this an especially important aspect of pollution prevention at many facilities. Permittees must consider the storage of all such products under roof, in silos or covered hoppers, or under tarps to minimize exposure of particulates to precipitation and wind-blown losses.

Unstabilized areas at a site which may be related to material handling and storage or vehicle and equipment traffic should be considered for paving. These areas can build up significant levels of particulates from materials and material handling as well as soil and dust particles. Paving these areas allow good housekeeping measures to be practiced and make spills easier to clean up.

(b) Source Controls—Permittees must consider preventative measures to minimize the exposure of significant materials to storm water. Due to the large volumes of materials used in the primary metals industry, they are a significant potential source of pollutants in storm water discharges. Storage of a wide range of materials outside is common among many facilities and measures should be taken to reduce the potential for contamination of storm water.

Measures include moving materials inside, under roof or cover, removing waste materials from the premises, and establishing scheduled removal of wastes to minimize storage onsite. Other measures to prevent runoff from contacting materials include swales, berms, dikes, or curbs to divert runoff away from significant materials or processes.

Source controls offer the most effective way to reduce pollutants in storm water discharges and are generally easier to implement than treatment measures.

(c) Preventive Maintenance—Facilities must incorporate into their plan the inspection and maintenance of all equipment which could lead to releases of pollutants. This includes all particulate emissions control equipment, storage tanks and piping systems, and any other material handling equipment which could fail and release pollutants.

All particulate pollution control equipment must be maintained to operate properly and effectively to control settling of particulate matter. The inspection of emissions control is particularly important as failures may not be immediately obvious and could lead to significant releases of particulate matter. Leaks or blockage in ducts, overflows of dust collection systems, or mechanical breakdown of scrubbers could all lead to heavy particulate emission which can be easily washed away by storm water discharges. Other potential losses include leaking tanks or valves which could contain a variety of acids, solvents, or other chemicals.

(d) Spill Prevention and Response Procedures—There are no additional requirements beyond those described in Part VI.C. of this fact sheet.

(e) Inspections—Primary metals facilities are required to conduct self inspections of all storage, process, and plant yard areas at least quarterly. These inspections will allow the effectiveness of the pollution prevention plan to be monitored. The potential for problems which could affect storm water are extremely varied and can have significant impacts over a short time period. These inspections are necessary to ensure that problems are identified and remedied as quickly as possible. Points of particular importance include pollution control equipment, material handling areas, and waste collection and disposal areas. Tanks, drums, silos, bins, and hoppers are other areas of potential concern.

(f) Employee Training—There are no additional requirements beyond those described in Part VI.C. of this fact sheet. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to

the storm water pollution prevention plan.

(g) Recordkeeping and Internal Reporting Procedures—There are no additional requirements beyond those described in Part VI.C. of this fact sheet.

(h) Non-storm Water Discharges—There are no additional requirements beyond those described in Part VI.C. of this fact sheet.

(i) Sediment and Erosion Control—There are no additional requirements beyond those described in Part VI.C. of this fact sheet.

(j) Management of Runoff—Facilities shall consider implementation of a range of management practices to control or treat storm water runoff. These include vegetative buffer strips or swales, filter fences and other types of filters, oil/water separators, and all types of settling basins and ponds. These practices allow the capture of pollutants from storm water before it leaves the site.

Due to the large size of many primary metals facilities, source controls may not be practical. In some cases, it may not be feasible to cover or otherwise protect large areas of material storage or exposed plant yards. Deposition of particulates from furnace or other process emissions may be relatively diffuse over a large area of the facility, and very difficult to control. In these cases management practices such as settling basins, retention or detention ponds, or recycle ponds can provide effective treatment of runoff. For smaller areas, filter fabric, booms, or other types of filters may be appropriate. In areas where oil and grease is a concern, oil/water separators may be appropriate and should be considered.

b. Comprehensive Site Compliance Evaluation. The storm water pollution prevention plan must describe the scope and content of comprehensive site evaluations that qualified personnel will conduct to 1) confirm the accuracy of the description of potential pollution sources contained in the plan, 2) determine the effectiveness of the plan, and 3) assess compliance with the terms and conditions of the permit. Comprehensive site compliance evaluations should be conducted on an annual basis. The individual or individuals that will conduct the evaluations must be identified in the plan and should be members of the pollution prevention team. Evaluation reports must be retained for at least 3 years after the date of the compliance evaluation that the permit expires.

Based on the results of each evaluation, the description of potential pollution sources, and measures and controls, the plan must be revised as appropriate within 2 weeks after each evaluation. Changes in the measures and controls must be implemented on the site in a timely manner, and never more than 12 weeks after completion of the evaluation.

7. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that primary metals facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires some primary metals facilities to collect and analyze samples of their storm water discharges for the pollutants listed in Table F–7. Data submitted to EPA has been analyzed at the 3-digit SIC code level. Industry subgroups that had pollutant levels above benchmark levels are required to monitor for those pollutants. Because these pollutants have been reported at benchmark levels from primary metals facilities, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity". The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, nitrate plus nitrite nitrogen is above the bench mark concentrations for the non-ferrous rolling and drawing and the non-ferrous foundries subsectors and pyrene is above the bench mark concentrations for the iron and steel foundries subsector. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in these subsectors, EPA has determined that the higher concentrations of nitrate plus nitrite nitrogen and pyrene are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require non-ferrous rolling and drawing, the non-ferrous foundries or iron and steel foundries facilities to conduct analytical monitoring for these parameters.

At a minimum, storm water discharges from selected primary metals facilities must be monitored quarterly during the second year of permit coverage. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter that they were required to monitor as listed in Tables F–7 through F–10, after taking into account possible waivers based on the alternative certification. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE F–7.—STEEL WORKS, BLAST FURNACES, AND ROLLING AND FINISHING MILLS (SIC 331) MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Aluminum .	0.75 mg/L
Total Recoverable Zinc	0.065 mg/L

TABLE F–8.—IRON AND STEEL FOUNDRIES (SIC 332) MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Aluminum .	0.75 mg/L
Total Suspended Solids (TSS)	100 mg/L
Total Recoverable Copper	0.0636 mg/L
Total Recoverable Iron	1 mg/L
Total Recoverable Zinc	0.065 mg/L

TABLE F–9.—ROLLING, DRAWING, AND EXTRUDING OF NON-FERROUS METALS (SIC 335) MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Copper	0.0636 mg/L
Total Recoverable Zinc	0.065 mg/L

TABLE F–10.—NON-FERROUS FOUNDRIES (SIC 336) MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Copper	0.0636 mg/L
Total Recoverable Zinc	0.065 mg/L

If the average concentration for a parameter is less than or equal to the value listed in Tables F–7 through F–10, then the permittee is not required to

conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Tables F–7 through F–10, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table F–11.

TABLE F–11.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Tables F–7 through F–10, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Tables F–7 through F–10, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Tables F–7 through F–10. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut off concentrations listed in Tables F–7 through F–10 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities which submitted Part 2 data, reported concentrations greater than or equal to the values listed in Tables F–7 through F–10. Facilities that achieve average discharge concentrations which are less than or equal to the values in Tables F–7 through F–10 are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

(1) Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hours storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

(2) Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)) shall be provided in the plan.

(3) Alternative Certification. Throughout today's permit, EPA has required monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring described in Tables F–10 through F–13, under penalty of law, signed in accordance with Part VII.G. of the pursuit (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA along with

the monitoring reports required under paragraph *b.* below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

b. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one Discharge Monitoring Report must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

c. Quarterly Visual Examination of Storm Water Quality. Quarterly visual inspections of a storm water discharge from each outfall are required at primary metals facilities. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once per quarter during the term of the permit during daylight unless there is insufficient rainfall or snow-melt to runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (e.g., drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

G. Storm Water Discharges Associated With Industrial Activity From Metal Mining (Ore Mining and Dressing)[43] Facilities

1. Industrial Profile

On November 16, 1990 (55 FR 47990), the U.S. Environmental Protection Agency (EPA) promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from eleven major categories of facilities, including: "(i) facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N * * * ." and "* * * (iii) facilities classified as Standard Industrial Classifications 10 through 14 (metal mining industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of noncoal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or that has come into contact with, any overburden, raw material, intermediate products, finished products, by-products or waste products located on the site of such operations."

This section of today's general permit only applies to the portions of categories (i) and (iii) identified by 40 CFR Part 440 and the metal mining industry (Standard Industrial Classification (SIC) code 10). SIC code 10 includes establishments primarily engaged in mining, developing mines, or exploring for metallic minerals (ores). This group also includes all ore dressing and beneficiating operations, whether performed at mills operated in conjunction with the mines served or at mills, such as custom mills, operated separately. Common activities at these mills include: crushing, grinding, and separation by gravity concentration, magnetic separation, electrostatic separation, flotation, or leaching[44]. The following is a listing of the types of mining/milling facilities that are covered under SIC code 10: Iron Ores (SIC Code 1011); Copper Ores (SIC Code 1021); Lead and Zinc Ores (SIC Code 1031); Gold Ores (SIC Code 1041); Silver Ores (SIC Code 1044); Ferroalloy Ores, Except Vanadium (SIC Code 1061); Uranium-Radium-Vanadium Ores (SIC Code 1094); and Miscellaneous Metal Ores, Not Elsewhere Classified (SIC Code 1099).

This section does not cover any discharge subject to effluent limitation guidelines, including storm water that combines with process wastewater and mine drainage. Storm water that does not come into contact with any overburden, raw material, intermediate product, finished product, by-product, or waste product located on the site of

[43] For the purposes of this part of the fact sheet, the term "metal mining" includes all ore mining and/or dressing and beneficiating operations, whether performed at mills operated in conjunction with the mines served or at mills, such as custom mills, operated separately.

[44] For more information on metal mines/mills see EPA, Effluent Guidelines Division. November 1982. "Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category." EPA 440/1–82/061.

the operation is not subject to permitting under this section according to Section 402(l)(2) of the Clean Water Act. Storm water discharges associated with industrial activity from inactive mining operations occurring on Federal lands where an operator cannot be identified cannot be covered by this permit.

Storm water discharges from mining claims where no mining activities have been undertaken (including no historic activities) except minimal activities undertaken for the purpose of maintaining a mining claim do not need to be covered by a permit. (This applies to Federal and private lands.)

This section is applicable to all phases of mining operations, whether active or inactive, as long as there is exposure to significant materials. This includes land disturbance activities such as the expansion of current extraction sites, active and inactive mining stages, and reclamation activities.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

There are typically three phases to a mining operation: the exploration and construction phase; the active phase; and the reclamation phase. The exploration and construction phase entails exploration and a certain amount of land disturbance to determine the financial viability of a site. Construction includes building of site access roads, and removal of overburden and waste rock to expose minable ore. These land-disturbing activities are significant potential sources of storm water contaminants. The active phase includes each step from extraction through production of a saleable product. The active phase may include periods of inactivity due to the seasonal nature of these metal mining activities. The final phase of reclamation is intended to return the land to its pre-mining state.

Because of the land-disturbing nature of the ore mining and dressing industry, contaminants of concern generated by industrial activities in this industry include total suspended solids (TSS), total dissolved solids (TDS), turbidity, pH, and heavy metals. Table G–1 lists potential pollutant source activities, and related pollutants associated with ore mining and dressing facilities.

TABLE G–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS

Activity	Pollutant source	Pollutant
Site Preparation	Road Construction	Dust, TSS, TDS, turbidity.
	Removal of Overburden	Dust, TSS, TDS, turbidity.
	Removal of waste rock to expose the metal	Dust, TSS, TDS, turbidity.
Mineral Extraction	Blasting activities	Dust, TSS, nitrate/nitrite.
Beneficiation Activities	Milling	Dust, TSS, TDS, pH, turbidity, fines, heavy metals.
	Flotation	Dust, TSS, TDS, pH, turbidity, fines, chemical reagents, acids, heavy metals.
	Gravity Concentration	TSS, TDS, pH, turbidity, heavy metals.
	Amalgamation	Dust, TSS, TDS, pH, turbidity, heavy metals, mercury.
	Waste Rock Storage	Dust, TSS, TDS, turbidity, pH, heavy metals.
	Raw Material Loading	Dust, TSS, TDS, turbidity, heavy metals.
	Processing materials unloading	Diesel fuel, oil, gasoline, chemical reagents.
	Raw or Waste Material Transportation	Dust, TSS, TDS, turbidity, heavy metals.
Leaching	Heap leach piles	Dust, TSS, TDS, turbidity, pH, heavy metals, cyanide.
Other Activities.	Sedimentation pond upsets	TSS, TDS, turbidity, pH, heavy metals.
	Sedimentation pond sludge removal and disposal	Dust, TSS, TDS, turbidity, pH, heavy metals.
	Air emission control device cleaning	Dust, TSS, TDS, turbidity.
Equipment/Vehicle Maintenance	Fueling activities	Diesel fuel, gasoline, oil.
	Parts cleaning	Solvents, oil, heavy metals, acid/alkaline wastes.
	Waste disposal of oily rags, oil and gas filters, batteries, coolants, degreasers.	Oil, heavy metals, solvents, acids
	Fluid replacement including hydraulic fluid, oil, transmission fluid, radiator fluids, and grease.	Oil, arsenic, lead, cadmium, chromium, benzene, TCA, TCE, PAHs, solvents.
Reclamation Activities	Site preparation for stabilization	Dust, TSS, TDS, turbidity, heavy metals.

Sources: Storm Water Group Applications, Parts 1 and 2 and EPA. "Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category." (EPA 440/1–82/061) November 1982.

Industrial activities, significant materials, and material management practices associated with ore mining and dressing methods are typically similar, varying only in the type of rock being mined. Examples of mineral commodities obtained from ore mining and dressing facilities include: iron; copper; lead; zinc; gold; silver; ferroalloy ores such as molybdenum, manganese, chromium, cobalt, nickel, and tungsten; uranium; radium; vanadium; aluminum; antimony; bauxite; platinum; tin; and titanium. Industrial activities include, ". . . but [are] not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process wastewaters (as defined at 40 CFR Part 401); sites used for the storage and maintenance of material handling

equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished materials; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water" (40 CFR 122.26(b)(14)). The most common industrial activities at metallic mine sites include extraction of the metal, material crushing, and product separation. While all of these industrial activities can occur at metal mines, storm water discharges from some of the areas listed cannot be covered by this permit (see Part VIII.G.4. Discharges Covered Under This Section).

Significant materials include, ". . . but [are] not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; . . . hazardous substances designated under Section 101(14) of CERCLA; any chemical facilities required to report pursuant to Section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharge" (40 CFR 122.26(b)(12)). Significant materials commonly found at mining facilities include: overburden; waste rock; sub-ore piles; tailings; petroleum-based products; solvents and detergents; manufactured products; and other waste materials.

Materials management practices are defined as those practices employed to diminish contact by significant materials with precipitation and storm water runon, or practices utilized to reduce the offsite discharge of contaminants. To this end, sediment ponds, discharge diversion techniques, as well as methods of dispersion, are used to minimize impacts of significant materials on storm water. For mine sites requiring additional sources of water for processing operations, rainfall events as well as storm water runon will be managed for use in dust suppression, processing, and washing activities. Many mine sites are already equipped with sedimentation ponds and other established process wastewater treatment methods in order to meet effluent limitation guidelines. Additional storm water management practices used at mineral mining facilities include: discharge diversions; drainage/storm water conveyances; runoff dispersion; sediment control and collection practices; vegetation/soil stabilization; capping contaminated sources; and treatment.

Metals are recovered by three basic extraction techniques: surface mining; underground mining; and placer mining. Each type of extraction method may be followed by varying methods of beneficiation and processing. Presented below are brief descriptions of the industrial activities, significant materials, and materials management practices associated with these four extraction processes and associated beneficiation activities. Due to similarities in mining operations for many of the minerals within this sector, industrial activities, significant materials, and materials management practices are fairly uniform across this sector. Unique practices are noted.

a. Surface Mining. Many mining facilities access metal deposits using surface extraction techniques such as strip mining, open-pit, open-cut, and open-cast. Surface mining is more economical than underground especially when the ore body is large and near the surface.

(1) Industrial Activities. Extraction activities include removal of overburden and waste rock to access metal deposits. These land-disturbing activities generate piles of topsoil and other overburden as well as waste rock, which are typically stored beside, or within, the pit or quarry. In addition, land disturbance, drilling, blasting, stripping, and materials handling activities create large amounts of dust that are either dispersed by local wind patterns or collected in air pollution control mechanisms. At closure, overburden and waste rock may or may not be used to reclaim the pit or quarry depending on Federal, State, and local requirements. In addition, access roads and rail spurs, and associated loading and unloading areas, are found onsite.

Following extraction, the mined materials may be transferred to a nearby beneficiation/processing facility. At an ore beneficiation facility, the valuable metals are separated from the less valuable rock to yield a product which is higher in metal content. To accomplish this, the ore must be crushed and ground small enough so that each particle contains mostly the mineral to be recovered or mostly the less valuable, or gangue, material. Valuable minerals are separated from the gangue by gravity concentration, magnetic separation, electrostatic separation, flotation, and leaching.

(2) Significant Materials. Significant materials generated by most extraction activities at surface mines include overburden piles, waste rock piles, ore and subore piles, and materials spilled from loading and unloading activities. Other exposed materials that can be generated at these types of operations (as well as other metal mines), include: tailings from flotation and other separation stages; soils impacted by fugitive dust emissions; settling ponds that receive process wastewaters; dredged sediment disposal areas; as well as raw material and product storage. Dust and particulate matter collected in air pollution control mechanisms may also be disposed of in onsite waste piles.

(3) Materials Management Practices. Materials management practices at surface mines are typically designed to control dust emissions and soil erosion from extraction activities, and offsite transport of significant materials. Settling ponds and impoundments are commonly used to reduce total suspended solids (TSS), total dissolved solids (TDS), and other contaminants in process generated wastewaters. These controls may also be used to manage storm water runoff and runon with potentially few alterations to onsite drainage systems. Few sampling facilities indicated the presence of traditional BMPs. Only 29 percent of the sampling facilities have ponds or impoundments as a storm water control.

Tailings impoundments are used to manage tailings generated at facilities engaged in flotation or heavy media separation operations. These impoundments are used to manage beneficiation/processing wastewaters generated at the facility and may also be used to manage storm water runoff.

b. Underground Mining. Underground mining techniques are used to access metals located too far underground to access economically from the surface. Though typically a more expensive form of extraction, advantages to underground mining operations include year-round operation, less noise (applicable to facilities located near residential areas), and less surface land disturbance. The two main underground mining methods are stoping and caving. Both of these methods can be used in several variations depending on the characteristics of the ore body. Common stoping methods include cut-and-fill, square cut (timbered), shrinkage, and open. Caving methods include undercut, block, and sub-level. Underground mining is usually independent of surface mining, but sometimes underground mining precedes or follows surface mining.

(1) Industrial Activities/Significant Materials. Industrial activities that may be associated with storm water discharges include: loading/unloading activities; haul roads; products and materials storage; waste piles; and processing activities. Exposed materials

associated with surface beneficiation and processing facilities at underground mines are similar to those associated with surface mining facilities.

(2) Materials Management Practices. Materials management practices for significant materials at the surface of underground mining facilities are similar to those materials management practices used at surface mining operations. However, waste rock or mill tailings are in some cases being returned to the mine as fill for the mined-out areas or may be directed to a disposal basin.

c. Placer Mining. Placer mining is used to mine alluvial sands and gravels containing valuable metallic minerals. Placer deposits are usually mined exclusively for gold material but smaller amounts of platinum, tin, and tungsten may also be recovered. There are three main placer mining techniques including dredge, hydraulic, and open cut methods.

(1) Industrial Activities. The industrial activities at dredging placer mines excavate underwater gold deposits by bucketline, dragline, or by suction. The excavation devices dig, wash, and screen gold values which are then recovered using gravity concentration methods. Hydraulic placer mines characteristically use high pressure water jets to excavate value-laden gravel banks. The most commonly used placer mining extraction method is the open cut. It involves stripping away topsoil and overburden to expose the auriferous gravels. The gold bearing gravels are excavated in sections and pushed to a placer wash plant for processing. Gravitational concentration is the common beneficiating technique at placer mines.

(2) Significant Materials. Significant materials generated at placer operations include overburden, mine development rock, ore, sub-ore piles, mine waste dumps, tailings ponds and piles. Potential natural constituents include mercury, arsenic, bismuth, antimony, thallium, pyrite, and pyrrhotite. After settling, the liquid portion of the slurry is returned to the mill as process water and the remaining slurried waste is pumped to tailings. In placer operations, however, tailings are disposed of in streams or on land.

(3) Materials Management Practices. Settling ponds are used to manage process wastewaters and are in some cases being used to manage contaminated storm water runoff. Few materials management practices were indicated in the part 1 group applications.

d. Inactive Mine Sites. Inactive ore mining and dressing operations are those where industrial activities are no longer occurring. When active, mineral extraction could have occurred from surface mines, solution mines, placer operations, or underground mines. These sites are included in this section because significant materials may remain onsite. These materials, if exposed, are potential sources of storm water contamination. Until an inactive metals mine and/or beneficiation operation has been reclaimed under applicable State or Federal laws after December 17, 1990, the site is considered associated with an "industrial activity" and is subject to the conditions of this section. Due to the seasonal nature of this industry, mine sites can become temporarily inactive for extended periods of time. Temporarily inactive sites are not viewed the same as permanently inactive sites.

2. Pollutants Found in Storm Water Discharges From Metal Mining

The volume of storm water discharges and the type and concentrations of pollutants found in storm water discharges from active and inactive metal mining facilities will vary according to several factors. Such factors include: geographic location; hydrogeology; the physical and chemical characteristics of the ores extracted; the physical and chemical characteristics of the waste rock and overburden removed; how the ore was extracted (e.g., open pit, underground, solution or dredging); the type of industrial activities occurring onsite (e.g., extraction, crushing, washing, milling, reclamation, etc.); the size of the operation; type, duration, and intensity of precipitation events; temperature ranges and variations; and the types of pollutant control measures used at the site. Each of these, and other factors will interact to influence the quantity and quality of storm water runoff. For example, air emissions (i.e., dust) may be a significant source of pollutants at some facilities, while roads constructed of waste rock may be a primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections, spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the metal mining (ore mining and dressing) industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: iron ore; copper ores; lead and zinc ores, gold and silver ores; ferroalloy ores, except vanadium; metal mining services; and miscellaneous metal ores (including uranium-radium-vanadium ores). Table G–2 below includes data for the eight pollutants that all facilities were required to monitor for under Form 2F. The table also lists those parameters that EPA has determined merit further monitoring.

A table has not been included for the following subsectors because less than 3 facilities submitted data in that subsector; iron ores; lead and zinc ores; gold and silver ores; ferroalloy ores, except vanadium; metal mining services; and miscellaneous metal ores (including uranium-radium-vanadium ores).

TABLE G–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY COPPER ORE MINING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	4	1	7	1	11.0	18.0	0.0	18.0	27.0	18.0	11.0	18.0	43.6	.....	81.9	.....
COD	4	2	7	4	234.7	360.0	0.0	160.0	630.0	740.0	160.0	270.0	1448.6	888.2	3835.9	1386.6
Nitrate + Nitrite Nitrogen	4	1	5	2	1.84	1.50	0.00	1.40	5.30	1.60	1.40	1.50	6.35	1.75	11.5	1.86
Total Kjeldahl Nitrogen	3	1	4	2	3.98	3.70	1.20	1.50	7.00	5.90	3.85	3.70	13.60	14.63	25.55	28.30
Oil & Grease	3	N/A	5	N/A	1.0	N/A	0.0	N/A	5.0	N/A	0.0	N/A	.....	N/A	.....	N/A
pH	5	N/A	13	N/A	N/A	N/A	4.5	N/A	8.2	N/A	7.8	N/A	9.7	N/A	10.7	N/A
Total Phosphorus	5	3	10	5	2.17	7.54	0.00	0.00	14.00	7.00	0.11	0.17	13.53	7.93	68.67	28.25
Total Suspended Solids	4	2	6	4	18113	580	0	330	100000	850	2135	570	350477	1159	4050366	1596

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.

[ii] Composite samples.

3. Options for Controlling Pollutants From Metal Mines

There are two options for reducing pollutants in storm water discharges; end-of-pipe treatment and implementing Best Management Practices to prevent and/or eliminate pollution. Discharges from mining operations are in some ways dissimilar to other types of industrial facilities. Mining facilities are often in remote locations and may operate only seasonally or intermittently, yet need year-round controls because significant materials remain exposed to precipitation when reclamation is not completed. These characteristics make resource intensive end-of-pipe management controls less desirable. A comprehensive storm water management program for a given plant may include controls from each of these categories. Development of comprehensive control strategies should be based on a consideration of site and facility plant characteristics.

a. End-of-Pipe Treatment. At many ore mining and dressing facilities, it may be appropriate to collect and treat the runoff from targeted areas of the facility. This approach was taken with 11 industrial subcategories within the ore mining and dressing industry, subject to national effluent limitation guidelines mill process wastewater and mine drainage. There are several areas where effluent limitation guidelines influence the permitting strategy for storm water discharges: whenever storm water and mill process wastewater and mine drainage combine, the storm water discharge is also subject to effluent limitation guidelines; to meet the numeric effluent limitation guidelines, most, if not all, facilities must collect and temporarily store onsite runoff from targeted areas of the plant; the effluent limitation guidelines do not apply to discharges whenever rainfall events, either chronic or catastrophic, cause an overflow of storage devices designed, constructed, and maintained to contain a 10-year, 24-hour storm; and most technology-based treatment standards, used for treating discharges subject to effluent limitation guidelines, are based on relatively simple technologies such as settling of solids, neutralization, and drum filtration.

For storm water discharges that are not covered by the effluent limitations guidelines, BMPs may be an appropriate means for limiting pollutant contributions. However, in cases of poor quality storm water discharges (e.g., low pH, high metals, etc.), treatment may be necessary to protect receiving waters.

b. Best Management Practices. Effective storm water management controls for limiting the offsite discharge of storm water pollutants from ore mining and dressing facilities are source reduction BMPs. Source reduction BMPs are methods by which discharges of contaminants are controlled with little or no required maintenance. Examples of these types of controls include source reduction diversion dikes, vegetative covers, and berms. Source reduction practices are typically (but not always) low in cost and relatively easy to implement. In some instances, more resource intensive treatment BMPs, including sedimentation ponds, may be necessary depending upon the type of discharge, types and concentrations of contaminants, and volume of flow.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. The management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with mining activity.

The following four categories describe best management practice options for reducing pollutants in storm water discharges from ore mining and dressing facilities: discharge diversions; sediment and erosion control; capping of contaminated sources; treatment.

Because ore mining and dressing is largely a land disturbance activity, BMPs that minimize erosion and sedimentation will be most effective if installed at the inception of operations and maintained throughout active operations and reclamation of the site. From the construction of access and haul roads, to closure and reclamation activities, implementation of BMPs is often essential to minimizing long-term environmental impacts to an area.

Part 1 group application data indicates that few storm water BMPs have been implemented at sampling facilities. The group application process did not require a description of BMP locations, and did not require applicants to describe the number of identical BMPs implemented at each site. As a result, the effectiveness of BMPs, for storm water management, at these facilities cannot be evaluated.

Many BMPs were not listed by facilities because they have been implemented to treat waters subject to effluent limitation guidelines, and are not exclusively used for storm water management. For instance, 29 percent of the sampling subgroup reported using ponds for sediment control and collection. Since some facilities classified as SIC Code 10 are subject to effluent limitation guidelines, sedimentation ponds may be implemented at greater proportions than indicated in part 1 of the group applications.

Because BMPs described in the part 1 data are limited, EPA is providing an overview of supplementary BMPs for use at ore mining and dressing facilities. However, due to the site-specific nature of facilities within this sector, BMPs cited do not preclude the use of other viable BMP options. Table G–3 summarizes BMP options as they apply to land disturbance activities at ore mining and dressing facilities. Sources of BMP information include: "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990; "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September, 1992, (EPA 832–R–92–006); "Best Management Practices for Mining in Idaho," Idaho Department of Lands, November 1992; and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.

TABLE G–3.—SUMMARY OF MINE AREAS AND APPLICABLE BEST MANAGEMENT PRACTICES

Land-disturbed area	Discharge diversions	Conveyance systems	Runoff dispersion	Sediment control & collection	Vegetation	Containment	Treatment
Haul Roads and Access Roads.	Dikes, Curbs, Berms.	Channels, Gutters, Culverts, Rolling Dips, Road Sloping, Roadway Water Deflectors.	Check Dams, Rock Outlet Protection, Level Spreaders, Stream Alteration, Drop Structures.	Gabions, Riprap, Native Rock Retaining Walls, Straw Bale Barriers, Sediment Traps/ Catch Basins, Vegetated Buffer Strips.	Seeding, Willow Cutting Establishment.		
Pits/Quarries or Underground Mines.	Dikes, Curbs, Berms.	Channels, Gutters.	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Sediment Settling Ponds, Straw Bale Barrier, Siltation Berms.	Seeding	Plugging and Grouting.	Chemical/ Physical Treatment.
Overburden, Waste Rock and Raw Material Piles.	Dikes, Curbs, Berms.	Channels, Gutters.	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Plastic Matting, Plastic Netting, Erosion Control Blankets, Mulch-straw, Compaction, Sediment/ Settling Ponds, Silt Fences, Siltation Berms.	Topsoiling, Seedbed Preparation, Seeding.	Capping	Chemical/ Physical Treatment, Artificial Wetlands.
Reclamation	Dikes, Curbs, Berms.	Channels, Gutters.	Check Dams, Rock Outlet Protection, Level Spreaders, Serrated Slopes, Benched Slopes, Contouring, Drain Fields, Stream Alteration, Drop Structures.	Gabions, Riprap, and Native Rock Retaining Walls, Biotechnical Stabilization, Straw Bale Barriers, Sediment Traps/Catch Basins, Vegetative Buffer Strips, Silt Fences, Siltation Berms, Brush Sediment Barriers.	Topsoiling, Seedbed Preparation, Seeding, Willow Cutting Establishment.	Capping, Plugging and Grouting.	Chemical/ Physical Treatment, Wetlands.

Haul Roads and Access Roads—Placement of haul roads or access roads should occur as far as possible from natural drainage areas, lakes, ponds, wetlands or floodplains where soil will naturally be less stable for heavy vehicle traffic. If a haul road must be constructed near water, as little vegetation as possible should be removed from between the road and the waterway, as vegetation is a useful buffer against erosion and is an efficient sediment collection mechanism. The width and grade of haul or access roads should be minimal and should be designed to match natural contours of the area. Construction of haul roads should be supplemented by BMPs that divert runoff from road surfaces, minimize erosion, and direct flow to appropriate channels for discharge to treatment areas.

Pits or Quarries—Excavation of a pit or quarry must be accompanied by BMPs to minimize impacts to area surface waters. As discussed in construction of haul roads, as little vegetation as possible should be removed from these areas during excavation activities to minimize exposed soils. In addition, stream channels and other sources of water that may discharge into a pit or quarry should be diverted around that area to prevent contamination.

BMPs can be used to control total suspended solids levels in runoff from unvegetated areas. These can include sediment/settling ponds, check dams, silt fences, and straw bale barriers.

Overburden, Waste Rock, and Raw Material Piles—Overburden, topsoil, and waste rock, as well as raw material and intermediate and final product stockpiles should be located away from

surface waters and other sources of water, and from geologically unstable areas. If this is not practicable, surface water should be diverted around the piles. As many piles as possible should be revegetated, (even if only on a temporary basis.) At closure, remaining units should be reclaimed.

Reclamation Activities—When a mineral deposit is depleted and operations cease, a mine site must be reclaimed according to appropriate State or Federal standards. Closure activities typically include restabilization of any disturbed areas such as access or haul roads, pits or quarries, sedimentation ponds or work-out pits, and any remaining waste piles. Overburden and topsoil stockpiles may be used to fill in a pit or quarry (where practical.) Recontouring and revegetation should be performed to stabilize soils, and prevent erosion.

Major reclamation activities such as recontouring roads and filling in a pit or quarry can only be performed after operations have ceased. However, reclamation activities such as stabilization of banks, and reseeding and revegetation should be implemented in mined out portions, or inactive areas of a site as active mining moves to new areas.

EPA recognizes that quarries are frequently converted into reservoirs, or recreational areas, after the mineral deposit is depleted. However, this does not preclude the reclamation of disturbed areas above the quarry rim.

(1) Discharge Diversions. Discharge diversions provide the first line of defense in preventing the contamination of discharges, and subsequent contamination of receiving waters of the United States. Discharge diversions are temporary or permanent structures installed to divert flow, store flow, or limit storm water runon and runoff.

These diversion practices have several objectives. First, diversion structures can be designed to prevent otherwise uncontaminated (or less contaminated) water from crossing disturbed areas or areas containing significant amounts of contaminated materials, where contact may occur between runon and significant materials. These source reduction measures may be particularly effective for metal mining facilities to prevent runon of uncontaminated discharges from contacting exposed materials and/or reduce the flow across disturbed areas, thereby lessening the potential for erosion. Second, diversion structures can be used to collect or divert waters for later treatment, if necessary. The usefulness of these control measures are limited by such factors as the size of the area to be controlled and the type and nature of materials exposed and precipitation events.

Diversion dikes, curbs, and berms are temporary or permanent diversion structures that prevent runoff from passing beyond a certain point, and divert runoff away from its intended path. Dikes, curbs or berms may be used to surround and isolate areas of concern at metal mining sites, diverting flow around piles of overburden, waste rock, and storage areas, to minimize discharge contact with contaminated materials and to limit discharges of contaminated water from confined areas. The BMPs described below may be useful for storm water diversion at metal mining sites.

Channels or Gutters—Channels or gutters collect storm water runoff and direct its flow. Channels or gutters may act to divert runoff away from a potential source of contamination, but may also be used to channel runoff to a collection and/or treatment area including settling ponds, basins or work-out pits.

Open Top Box Culverts and Waterbars—These structures are temporary or permanent structures that divert water from a roadway surface. Open top box culverts may be used on steeply graded, unpaved roads in place of pipe culverts to divert surface runoff and flow from inside ditches onto the downhill slope of a road. These structures are typically made of wood and should periodically be monitored and repaired if necessary.

Rolling Dips and Road Sloping—Rolling dips and road sloping are permanent water diversion techniques installed using natural contours of the land during road construction. These BMPs prevent water accumulation on road surfaces and divert surface runoff toward road ditches, which then convey the storm water to ponds or other management areas.

Roadway Surface Water Deflector—A roadway surface water deflector is another technique to prevent accumulation of water on road surfaces. The structure uses a conveyor belt sandwiched between two pieces of treated wood and placed within the road to deflect water. This is a useful technique for steeply graded, unpaved roads.

Culverts—Culverts are permanent surface water diversion mechanisms used to convey water off or underneath a road. Made of corrugated metal, they must extend across the entire width of the road and beyond the fill slope. Additional erosion control mechanisms may need to be installed at the discharge end of the culvert.

Drainage systems are most effective when used in conjunction with runoff dispersion devices designed to slow the flow of water discharged from a site. These devices also aid storm water infiltration into the soil and flow attenuation. Some examples of velocity dissipation devices include check dams, rock outlet protection, level spreaders, and serrated and benched slopes.

Check Dams—Check dams are small temporary dams constructed across swales or drainage ditches to reduce the velocity of runoff flows, thereby reducing erosion and failure of the swale or ditch. This slowing reduces erosion and gullying in the channel and allows sediments to settle.

Rock Outlet Protection—Rock protection placed at the outlet end of culverts, channels, or ditches reduces the depth, velocity, and destructive energy of water such that the flow will not erode the downstream reach.

Level Spreaders—Level spreaders are outlets for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. Level spreaders diffuse storm water point sources and release it onto areas stabilized by existing vegetation.

Serrated Slopes and Benched Slopes—These runoff dispersion methods break up flow of runoff from a slope, decreasing its ability to erode. Serrated and benched slopes provide flat areas that allow water to infiltrate, and space for vegetation to grow and reinforce soils.

Contouring—Surface contouring is the establishment of a rough soil surface amenable to revegetation, through creating horizontal grooves, depressions, or steps that run with the contour of the land. Surface roughening aids in the establishment of vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold and grow.

Drain Fields—Drain fields are used to prevent the accumulation of water and/or ground water at a site, by diverting infiltrating sources through gravity flow or pumping.

Stream Alteration—Altering or channelizing the path of a stream to bypass all or some disturbed areas on a site allows additional mining activities and avoids contamination of stream water by disturbed lands. This practice is complicated, however, by the need to restore the channel when mining operations end.

Drop Structures—Drop structures are large angular rocks placed in a V-shaped pattern to slow the velocity of storm water runoff. These structures are typically reinforced by logs or large rocks imbedded in the streambanks.

(2) Erosion and Sediment Controls. Erosion and sediment controls limit movement and retain sediments from being transported offsite. Several structural collection devices have been developed to remove sediment from runoff before it leaves the site. Several methods of removing sediment from site runoff involve diversion mechanisms previously discussed, supplemented by a trapping or storage device. Structural practices typically involve filtering diffuse storm water flows through temporary structures such as straw bale dikes, silt fences, brush barriers or vegetated areas.

Structural practices are typically low in cost. However, structural practices require periodic removal of sediment to remain functional. As such, they may not be appropriate for permanent use at inactive mines. However, these practices may be effectively used as temporary measures during active operation and/or prior to the final implementation of permanent measures.

(a) Structural Practices.

(i) Sediment/Settling Ponds—Sediment ponds function as sediment traps by containing runoff for long periods of time, allowing suspended solids to settle. These structures can achieve a high removal rate of sediment for both process wastewater and storm water discharges.

Discharge ponds may also be designed to act as surge ponds which are designed to contain storm surges and then completely drain in about 24 to 40 hours, and remain dry during times of no rainfall. They can provide pollutant removal efficiencies that are similar to those of detention ponds.[45]

(ii) Gabions, Riprap, and Native Rock Retaining Walls—These BMPs are all forms of slope stabilization. Gabions consist of rocks (riprap) contained by rectangular wire boxes or baskets for use as permanent erosion control structures. Riprap consists of loose rocks placed along embankments to prevent erosion.

(iii) Biotechnical Stabilization—Biotechnical stabilization uses live brush imbedded in the soils of a steep slope to prevent erosion. This method relies on the premise that the imbedded vegetation will eventually root and help stabilize the slope.

(iv) Straw Bale Barrier—Straw bales may be used as temporary berms, barriers, or diversions, capturing sediments, filtering runoff. When installed and maintained properly, these barriers remove approximately 67 percent of the sediment load.[46]

(v) Sediment Traps or Catch Basins—These temporary or permanent structures are useful for catching and storing sediment laden storm water runoff and are particularly useful during construction activities to contain runoff. The effectiveness of these BMPs is better in smaller drainage basin areas. Sediment traps are less than 50 percent effective in removing sediment from storm water runoff.[47]

(vi) Vegetated Buffer Strips—The installation of vegetated buffer strips will reduce runoff and prevent erosion at a removal efficiency rate of 75 to 99 percent depending upon the ground cover.[48]

(vii) Silt Fence/Filter Fence—A low fence made of filter fabric, wire and steel posts, should be used on small ephemeral drainage areas where storm water collects or leaves a mine site. Silt fences remove 97 percent of the sediment load and are easier to maintain and remove without creating lasting impacts to the environment.[49]

(viii) Siltation Berms—Siltation berms are typically placed on the downslope side of a disturbed area to act as an impermeable barrier for the capture and retention of sediments in surface water runoff. Plastic sheeting is typically used to cover the berm. The berm and the plastic sheeting may require periodic maintenance and repair.

(ix) Brush Sediment Barriers—Brush barriers are temporary sediment barriers composed of tree limbs, weeds, vines, root mat, soil, rock and other cleared materials placed at the toe of a slope. A brush barrier is effective only for small drainage areas, usually less than ¼ acre, where the slope is minimal.

(b) Stabilization—Stabilization practices involve establishing a sustainable ground cover by permanent seeding, mulching, sodding, and other such practices. A vegetative cover reduces the potential for erosion of a site by: absorbing the kinetic energy of raindrops which would otherwise impact soil; intercepting water so it can infiltrate into the ground instead of running off and carrying contaminated discharges; and by slowing the velocity of runoff to promote onsite deposition of sediment. Stabilization controls are often the most important measures taken to prevent offsite sediment movement, and can provide a six-fold reduction in the discharge of suspended sediment levels.[50] Permanent seeding has been found to be 99 percent effective in controlling erosion for disturbed land areas.[51] Many states require that topsoil be segregated from other overburden for use during reclamation. While stored, topsoil stockpiles should be vegetated. This temporary form of vegetation can often be used for other piles of stored materials and for intermittent/seasonal operations.

Typically, the costs of stabilization controls are low relative to other discharge mitigation practices. Given the limited capacity to accept large volumes of runoff, and potential erosion problems associated with large concentrated flows, stabilization controls should typically be used in combination with other management practices. These measures have been documented as particularly appropriate for mining sites.

(i) Topsoiling, Seedbed Preparation—The addition of a layer of topsoil or plant growth material provides an improved soil medium for plant growth. Seedbed preparation may include the addition of topsoil ingredients to be mixed in with soils used for seedbed preparation.

(ii) Broadcast Seeding and Drill Seeding—Seeding and vegetative planting are methods used to revegetate an area. Broadcast seeding spreads seeds uniformly, by hand or machine, to steep sloped or rocky areas, flat surfaces, and areas with limited access.

(iii) Willow Cutting Establishment—Willow cutting establishment describes a method of soil stabilization useful for stream banks and other areas located adjacent to water. Similar to biotechnical stabilization, willow cuttings are used to promote growth in an area needing stabilization. Willow cuttings are typically used to reinforce a streambank or other moist area.

(iv) Plastic Matting, Plastic Netting, and Erosion Control Blankets—These BMPs are used to protect bare soils to control dust and erosion. Mats and blankets help to promote vegetative growth by maintaining moisture and heat within the soil.

[45] "Urban Targeting and BMP Selection," EPA, Region V, November 1990.

[46] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–14.

[47] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–26.

[48] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–7.

[49] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–15.

[50] "Performance of Current Sediment Control Measures at Maryland Construction Sites," January 1990, Metropolitan Washington Council of Governments, page X.

[51] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–4.

(v) Mulch-straw or Wood Chips—Mulches and wood chips are useful temporary covers for bare or seeded soils, with an erosion control effectiveness rating of 75 to 98 percent.[52] Like matting, mulch-straw or wood chips help soils retain moisture and warmth to promote vegetative growth.

(vi) Compaction—Soil compaction using a roller or other heavy equipment increases soil "strength" by increasing its density. More dense soil is less prone to erosion and long-term soil settlement.

(3) Capping. In some cases, the elimination of a pollution source through capping contaminant sources may be the most cost effective control measure for discharges from inactive ore mining and dressing facilities. Depending on the type of management practices chosen the cost to eliminate the pollutant source may be very high. Once completed, however, maintenance costs will range from low to nonexistent.

Capping or sealing of waste materials is designed to prevent infiltration, as well as to limit contact between discharges and potential sources of contamination. Ultimately, capping should reduce or eliminate the contaminants in discharges. In addition, by reducing infiltration, the potential for seepage and leachate generation may also be lessened.

EPA has identified a wide variety of best management practices (BMPs) that may be used to mitigate discharges of contaminants at active and inactive metal mines. Many of the practices focus on sediment and erosion control and are similar to BMPs used in the construction industry. These controls to prevent erosion and control sedimentation are the most effective if they are installed at the inception of operations and maintained throughout active operations and reclamation of the site. For more details on the use and implementation of these practices the reader is encouraged to obtain a copy of one or more of the many good sediment and erosion control books available on the market.[53] In some cases (e.g., low pH and/or high metals concentrations), BMPs, and sediment and erosion controls may not be adequate to produce an acceptable quality of storm water discharge. Under those circumstances additional physical or chemical treatment systems may be necessary to protect the receiving waters.

(4) Treatment. Treatment practices are those methods of control which normally are thought of as being applied at the "end of the pipe" to reduce the concentration of pollutants in water before it is discharged. This is in contrast to many BMPs, where the emphasis is on keeping the water from becoming contaminated. Treatment practices may be required where flows are currently being affected by exposed materials and other BMPs are insufficient to meet discharge goals. These practices are usually the most resource intensive, as they often require significant construction costs, and monitoring and maintenance on a frequent and regular basis. Treatment options may range from high maintenance controls to low maintenance controls. High maintenance treatment techniques require manpower to operate and maintain the BMP. Low maintenance cost techniques have initial capital costs but operate with low long-term maintenance after being implemented. At a few sites, treatment measures other than high maintenance measures may be appropriate to address specific pollutants.

(a) Chemical/Physical Treatment—An example of a high maintenance technology that is found at many active metal mining facilities is chemical/physical treatment. The most common type of chemical/physical treatment involves the addition of lime or other such caustics to neutralize the discharges and/or precipitate metals. Metals may be removed from wastewater by raising the pH of the wastewater to precipitate them out as hydroxides.

(b) Oil/Water Separators—Another example of a high maintenance treatment technology is an oil/water separator. An American Petroleum Institute (API) oil/water separator or similar type of treatment device which acts to skim oil and settle sludge can be used to remove oil from water.

(c) Artificial Wetlands—This type of BMP system can be an effective system for improving water quality either alone or in conjunction with other treatment practices. Wetland processes are able to filter sediments, and absorb and retain chemical and heavy metal pollutants through biological degradation, transformation, and plant uptake.

Natural wetlands should not be considered as part of the treatment system because they are considered to be waters of the United States. The necessary controls, or BMPs, must be provided prior to discharging the storm water runoff to natural wetlands or other receiving waters.

In summary, a wide variety of BMPs are available for use at active and inactive metallic mining and milling facilities. These measures range from simple low cost, low maintenance source reduction practices such as diversion structures to high cost, maintenance intensive practices such as wetlands treatment. Clearly, the selection of a practice or group of practices will be site-specific depending on conditions and potential impacts as well as the resources available at each site. A specific best available technology (or technologies) cannot be determined because of the differences between sites and the quantities and characteristics of their discharges.

(4) Discharges Covered Under This Section

Coverage under this section of today's permit is limited to all storm water discharges from inactive metal mining facilities and storm water discharges from the following areas of active metal mining facilities: topsoil piles; offsite haul/access roads if off active area; onsite haul roads if not constructed of waste rock or spent ore, and mine water is not used for dust control; runoff from tailings dams/dikes when not constructed of waste rock/tailings and no process fluids are present; concentration building, if no contact with material piles; mill site, if no contact with material piles; chemical storage area; docking facility, if no excessive contact with waste product; explosive storage; reclaimed areas released from reclamation bonds prior to December 17, 1990; and partially/inadequately reclaimed areas or areas not released from reclamation bonds.

Storm water discharges, or mine drainage discharges, which are subject to existing effluent limitations guidelines addressing storm water (or a combination of storm water and non-storm water) cannot be covered by this section. The effluent limitations guidelines that apply to active metal mining operations are contained in 40 CFR Part 440, Ore Mining and Dressing Point Source Category. These effluent guidelines include specific numeric limitations for mine drainage and discharges from mills, or "no discharge" requirements. Table G–4 identifies the discharge and source of the discharge from active metal mining facilities, that are subject to process wastewater limitations, mine drainage limitations, and storm water reporting requirements. Storm water discharges that are eligible

[52] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990.

[53] "Best Management Practices for Mining in Idaho," Idaho Department of State Lands, November 1992; "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September 1992 (EPA 832–R–92–005); and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.

for coverage under today's permit are identified under the coverage section of the permit. At all metal mining facilities, coverage under this section does not include adit drainage or contaminated springs or seeps. Table G–4 clarifies the applicability of the Effluent Limitations Guidelines found in 40 CFR Part 440. This table does not expand or redefine these Effluent Limitations Guidelines.

TABLE G–4.—APPLICABILITY OF 40 CFR PART 440 EFFLUENT LIMITATIONS GUIDELINES TO STORM WATER RUNOFF FROM ACTIVE ORE (METAL) MINING AND DRESSING SITES

Discharge/source of discharge	Applicable ELG, if any (see key)	Note/comment
Land application area runoff	MD	PW—if Process fluids present.
Crusher area	MD	PW—if Process fluids present.
Piles (seepage and/or runoff):		
Spent ore	MD	PW—if Process fluids present.
Surge/Ore	MD	PW—if Process fluids present.
Waste rock/overburden	MD	
Topsoil	SW	
Drainage:		
Pit drainage (unpumped)	MD	
Pit drainage (removed by pumping)	MD	
Mine water from underground mines (unpumped), adit discharges.	MD	
Mine water from underground mines (pumped)	MD	
Seeps/French drains	MD	PW—if Process fluids present.
Roads constructed of waste rock or spent ore:		
Onsite haul roads	MD	
Offsite haul/access roads	SW	(if off Active Area).
Roads not constructed of waste rock or spent ore:		
Onsite haul roads	SW	MD—if dust control with MD water.
Offsite haul/access roads	SW	
Milling/concentrating:		
Tailings impoundment/pile	PW	
Runoff from tailings dams/dikes when constructed of waste rock/tailings.	MD	PW—if Process fluids present.
Runoff from tailings dams/dikes when not constructed of waste rock/tailings.	SW	PW—if Process fluids present.
Heap leach pile runoff/seepage	PW	
Pregnant pond (barren and surge ponds also)	PW	
Polishing pond	PW	
Concentration building	SW	If storm water only, and no contact with piles.
Concentrate pile (product storage)	PW	
Mill site	SW	Same as concentration bldg.
Ancillary areas:		
Office/administrative building and housing	UC	Unless mixed with SW from industrial area, then SW.
Chemical storage area	SW	
Docking facility	SW	Excessive contact with waste product could constitute MD.
Explosive storage	SW	
Fuel storage (oil tanks/coal piles)	SW	
Vehicle/equipment maintenance area/building	SW	
Parking areas	SW	UC if only employee and visitor type parking.
Power plant	SW	
Truck wash area	SW	Excessive contact with waste product could constitute MD.
Reclamation-related areas:		
Any disturbed area (unreclaimed)	MD	SW if inactive area.
Reclaimed areas released from reclamation bonds after Dec. 17 1990.	UC	
Reclaimed areas released from reclamation bonds prior to Dec. 17 1990.	SW	
Partially/inadequately reclaimed areas or areas not released from reclamation bond.	SW	

KEY: UC—Unclassified; Not Subject to Storm Water Program or 40 CFR Part 440 Effluent Limitations Guidelines (ELG); MD—Subject to 40 CFR Part 440 ELG for mine drainage; PW—Subject to 40 CFR Part 440 ELG for mill discharge or process (including zero discharge ELG); SW—Storm water runoff from these sources are subject to the Storm Water Program, but are not subject to 40 CFR 440 ELG unless mixed with discharges subject to the 440 CFR 440 ELG that are not regulated by another permit prior to mixing. Non-storm water discharges from these sources are subject to NPDES permitting and may be subject to the effluent limitation guidelines under 40 CFR 440.

Temporarily inactive (e.g., winter closure, and portions of active mines that are no longer being mined, and where reclamation has not begun) mines will be permitted as an active mine. The following definitions apply to this section and are intended to provide clarification as to what is considered active, inactive, and temporarily inactive:

The following definitions are only for this section of today's permit and are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii):

"Active Metal Mining Facility" is a place where work or other related

activity to the extraction, removal, or recovery of metal ore is being conducted. With respect to surface mines, an "active metal mining facility" does not include any area of land on or in which grading has been completed to return the earth to a desired contour and reclamation work has begun.

"Inactive Metal Mining Facility" means a site or portion of a site where metal mining and/or milling activities occurred in the past but is not an active metal mining facility, as defined in this permit and that portion of the facility does not have an active mining permit issued by the applicable (federal or state) government agency that authorizes mining at the site.

"Temporarily Inactive Metal Mining Facility" means a site or portion of a site where metal mining and/or milling activities occurred in the past, but currently are not being actively undertaken, and the facility has an active mining permit issued by the applicable (federal or state) governmental agency that authorizes mining at the site.

Operators of storm water discharges from mining related industrial activities such as vehicle maintenance, or power plants should refer to the appropriate sections of today's permit for specific guidance or requirements. Clearing, grading, and excavation activity that disturbs 5 or more acres during the exploration or preparation for beginning active mining operations cannot be covered by this section. Coverage for this type of pre-mining activity can be covered by EPA's general permit for storm water discharges from construction activities or an applicable State-issued permit. Land disturbance activities associated with the active mining operations such as expansion of existing pits, can be covered by this section.

5. Storm Water Pollution Prevention Plan Requirements

All facilities subject to this section must prepare and implement a storm water pollution prevention plan. The establishment of a pollution prevention plan requirement reflects EPA's decision to allow operators of ore mining and dressing facilities to utilize BMPs as the BAT/BCT level of control for the storm water discharges covered by this section. The requirements included in pollution prevention plans provide a flexible framework for the development and implementation of site specific controls to minimize pollutants in storm water discharges. This approach is consistent with the approach used in the baseline general permits finalized on September 9, 1992 (57 FR 41236).

Pollution prevention can be an effective approach for controlling contaminated storm water discharges from metal mining facilities. Pollution prevention plans allow the operator of a facility to select BMPs based on site-specific considerations such as: facility size; climate; geographic location; hydrogeology; the environmental setting of each facility; and volume and type of discharge generated. This flexibility is necessary because each facility will be unique in that the source, type, and volume of contaminated surface water discharges will differ from site to site. In addition, EPA believes that the adoption of BMPs reduces environmental impacts by minimizing land disturbed areas susceptible to storm water runoff. Early implementation and maintenance of BMPs facilitates ongoing reclamation activities, reducing final reclamation costs associated with site closure. BMPs are also effective at temporarily or permanently inactive mine sites.

There are two major objectives to a pollution prevention plan: 1) to identify sources of pollution potentially affecting the quality of storm water discharges associated with industrial activity from a facility; and 2) to describe and ensure implementation of practices to minimize and control pollutants in storm water discharges associated with industrial activity from a facility.

Specific requirements for a pollution prevention plan for ore mining and dressing facilities are described below. These requirements must be implemented in addition to the baseline pollution prevention plan provisions discussed previously.

a. Active and Temporarily Inactive Metal Mining Facilities.

(1) Description of Mining Activities. The storm water pollution prevention plan shall provide a narrative description of the mining and associated activities taking place at the site which affect or may affect storm water runoff intended to be covered by this section. The narrative description shall report the total acreage within the mine site, an estimate of the acreage of land currently disturbed, and an estimate of the total acreage that will be disturbed throughout the life of the mine. A general description of the mining site relative to major transportation routes and communities shall also be provided.

(2) Description of Potential Pollution Sources. Each storm water pollution prevention plan must describe activities, materials, and physical features of the facility that may contribute to storm water runoff or, during periods of dry weather, result in dry weather flows and mine pumpout. This assessment of storm water pollution will support subsequent efforts to identify and set priorities for necessary changes in materials, materials management practices, or site features, as well as aid in the selection of appropriate structural and nonstructural control techniques. In addition to the baseline general requirements storm water pollution prevention plans must describe the following elements:

(a) Drainage—The plan must contain a map of the site that shows the pattern of storm water drainage, structural features that control pollutants in storm water runoff[54] and process wastewater discharges (including mine drainage), surface water bodies (including wetlands), places where significant materials[55] are exposed to rainfall and runoff, and locations of major spills and leaks that occurred in the 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit. The map also must show areas where the following activities take place: fueling, vehicle and equipment maintenance and/or cleaning, loading and unloading, material storage (including tanks or other vessels used for liquid or waste storage), material processing, waste disposal, haul roads, access roads, and rail spurs. The site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

(b) Inventory of Exposed Materials—Facility operators are required to carefully conduct an inspection of the site and related records to identify significant materials that are or may be exposed to storm water. The inventory

[54] Nonstructural features such as grass swales and vegetative buffer strips also should be shown.

[55] Significant materials include, "* * * but [are] not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; * * * hazardous substances designated under section 101(14) of CERCLA; any chemical facilities required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharge" (40 CFR 122.26(b)(12)). Significant materials commonly found at mining facilities include: overburden; raw materials; waste rock piles; tailings; petroleum based products; solvents and detergents; heap leach pads; tailings piles/ponds, both proposed and existing; and manufactured products, waste materials or by-products used or created by the facility.

must address materials that within 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit have been handled, stored, processed, treated, or disposed of in a manner to allow exposure to storm water. Findings of the inventory must be documented in detail in the pollution prevention plan. At a minimum, the plan must describe the method and location of onsite storage or disposal; practices used to minimize contact of materials with rainfall and runoff; existing structural and nonstructural controls that reduce pollutants in storm water runoff; existing structural controls that limit process wastewater discharges; and any treatment the runoff receives before it is discharged to surface waters or a separate storm sewer system. The description must be updated whenever there is a significant change in the types or amounts of materials, or material management practices, that may affect the exposure of materials to storm water.

In addition, any existing ore or waste rock/overburden characterization data, including results of testing for acid rock generation potential must be included in the pollution prevention plan. The intent is to get an idea of the pollutants (e.g., heavy metals) that may be present in the ore and waste rock/overburden.

(3) Measures and Controls. Following completion of the source identification and assessment phase, the permittee must evaluate, select, and describe the pollution prevention measures, best management practices (BMPs), and other controls that will be implemented at the facility. The permittee must assess the applicability of the following BMPs for their site: discharge diversions, drainage/storm water conveyance systems, runoff dispersions, sediment control and collection mechanisms, vegetation/soil stabilization, capping of contaminated sources, and treatment of storm water discharges. In addition, BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices that prevent or reduce the discharge of pollutants in storm water runoff.

The pollution prevention plan must discuss the reasons each selected control or practice is appropriate for the facility and how each will address the potential sources of storm water pollution. The plan also must include a schedule specifying the time or times during which each control or practice will be implemented. In addition, the plan should discuss ways in which the controls and practices relate to one another and, when taken as a whole, produce an integrated and consistent approach for preventing or controlling potential storm water contamination problems.

Under the inspection requirements of the pollution prevention plan, operators of active facilities are required to conduct monthly visual inspections of BMPs and designated equipment and mine areas. Owner/operators of temporarily inactive mining sites are required to conduct quarterly inspections. If weather conditions make the mine site inaccessible, the quarterly inspection will not be required. Active mining sites have frequent inspection periods because members of the pollution prevention team will be onsite, and the fact that they are active means there is a greater potential for pollution. The inspections shall include: (1) an assessment of the integrity of storm water discharge diversions, conveyance systems, sediment control and collection systems, and containment structures; (2) visual inspections of vegetative BMPs, serrated slopes, and benched slopes to determine if soil erosion has occurred; and (3) visual inspections of material handling and storage areas and other potential sources of pollution for evidence of actual or potential pollutant discharges of contaminated storm water.

Under the employee training requirements of the pollution prevention plan, facility operators are required to conduct employee training programs at least annually. The intent of this frequency is to provide a reminder to the employees of the requirements of the storm water pollution prevention plan.

(4) Non-storm Water Discharges. Each pollution prevention plan must include a certification, signed by an authorized individual, that discharges from the site have been tested or evaluated for the presence of non-storm water discharges, including discharges that are subject to 40 CFR Part 440. The certification must describe possible significant sources of non-storm water, the results of any test and/or evaluation conducted to detect such discharges, the test method or evaluation criteria used, the dates on which tests or evaluations were performed, and the onsite drainage points directly observed during the test or evaluation. Pollution prevention plans must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water discharge.

Under the non-storm water discharge section of the pollution prevention plan, EPA will allow non-storm water discharges that mix with storm water under this section provided that the plan includes a certification that any non-storm water discharge which mixes with storm water is subject to a separate NPDES permit that applies applicable effluent limitations prior to the mixing of non-storm water and storm water. In such cases, the certification shall identify the non-storm water discharge(s), the applicable NPDES permit(s), the effluent limitations placed on the non-storm water discharge by the NPDES permit(s), and the point(s) at which the limitations are applied. In addition, Part III.A.2 of today's permit discusses non-storm water discharges that may be eligible for coverage under the permit.

b. Inactive Metal Mining Facilities

(1) Pollution Prevention Team. The storm water pollution prevention plan must identify specific individual(s) who are responsible for the development, implementation, maintenance, and revision of the pollution prevention plan. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the storm water pollution prevention plan at the inactive facility. Members of the pollution prevention team do not have to be permanently located at the inactive facility, such as the requirement for any active facility.

(2) Description of Mining Activities. The storm water pollution prevention plan shall provide a narrative description of the mining and associated activities that took place at the site. The narrative description shall report the approximate dates of operation, total acreage within the mine site and/or processing site, an estimate of the total acreage disturbed, and the activities (reclamation, etc.) that are currently taking place at the facility. A general description of the mining site relative to major transportation routes and communities shall also be provided.

(3) Description of Potential Pollution Sources. Each storm water pollution prevention plan must describe activities, materials, and physical features of the facility that may contribute to storm water runoff or, during periods of dry weather, result in dry weather flows. This assessment of storm water pollution will support subsequent efforts to identify and set priorities for necessary changes in materials, materials management practices, or site features, as well as aid in the selection of appropriate structural and nonstructural control techniques. In addition to the baseline general requirements storm water pollution prevention plans must describe the following elements:

(3) Drainage—The plan must contain a map of the site that shows the pattern of storm water drainage, structural features that control pollutants in storm water runoff[56] and process wastewater discharges (including mine drainage), surface water bodies (including wetlands), places where significant materials[57] are exposed to rainfall and runoff. The map also must show the location of the following: any remaining equipment storage, fueling, and maintenance areas; areas used for outdoor manufacturing, storage, or disposal of materials; the boundaries of former mining and milling sites; the location of each storm water outfall and an outline of the portions of the drainage area that are within the facility boundaries; tailings piles and ponds; mine drainage or any other process water discharge point; and an estimate of the direction of flow. In addition, the site map must also indicate the types of discharges contained in the drainage areas of the outfalls (e.g., storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

(b) Inventory of Exposed Materials—The storm water pollution prevention plan shall include, for each outfall, an inventory and narrative description of any significant materials that may still be at the site. The description and locations of the significant materials should be consistent with those shown on the site map. Findings of the inventory must be documented in detail in the pollution prevention plan. At a minimum, the plan must describe the method and location of onsite storage or disposal; practices used to minimize contact of materials with rainfall and runoff; existing structural and nonstructural controls that reduce pollutants in storm water runoff; existing structural controls that limit process wastewater discharges; and any treatment the runoff receives before it is discharged to surface waters or a separate storm sewer system.

(c) Risk Identification and Summary of Potential Pollutant Sources—The description of potential pollution sources culminates in a narrative assessment of the risk potential that sources of pollution pose to storm water quality. This assessment should clearly point to activities, materials, and physical features of the facility that have a reasonable potential to contribute significant amounts of pollutants to storm water. The assessment must list any significant pollution sources at the site and identify the pollutant parameter or parameters (i.e., total suspended solids, arsenic, etc.) associated with each source.

(4) Measures and Controls. Following completion of the source identification and assessment phase, the permittee must evaluate, select, and describe the pollution prevention measures, best management practices (BMPs), and other controls that will be implemented at the facility. The permittee must assess the applicability of the following BMPs for their site: discharge diversions, drainage/storm water conveyance systems, runoff dispersions, sediment control and collection mechanisms, vegetation/soil stabilization, capping of contaminated sources, and treatment of storm water discharges. In addition, BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices that prevent or reduce the discharge of pollutants in storm water runoff. EPA recognizes that inactive mine sites and abandoned mine sites will most likely require different storm water controls because the sources and types of contamination may vary. EPA notes that inactive facilities are not required to conduct inspections such as those described in Part XI.G.3.a.(4)(d) of the permit for active and temporarily inactive facilities. Inactive sites must, however, conduct comprehensive site compliance evaluations as discussed in paragraph (5) below.

The pollution prevention plan must discuss the reasons each selected control or practice is appropriate for the facility and how each will address the potential sources of storm water pollution. The plan also must include a schedule specifying the time or times during which each control or practice will be implemented. In addition, the plan should discuss ways in which the controls and practices relate to one another and, when taken as a whole, produce an integrated and consistent approach for preventing or controlling potential storm water contamination problems.

(5) Comprehensive Site Compliance Evaluation. Where annual site compliance evaluations are shown in the plan to be impractical for inactive mining sites due to the remote location and inaccessibility of the site, site evaluations required under this part shall be conducted at appropriate intervals specified in the plan, but, in no case less than once in 3 years.

6. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that active copper ore mining facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires active copper ore mining and dressing facilities to collect and analyze samples of their storm water discharges for the pollutants listed in Table G–5. The pollutants listed in Table G–5 were found to be above levels of concern for a significant portion of active copper ore mining and dressing facilities that submitted quantitative data in the group application process. Because these pollutants have been reported at levels of concern from active copper ore mining and dressing facilities, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

At a minimum, storm water discharges from active metal mining facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table G–5. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

[56] Nonstructural features such as grass swales and vegetative buffer strips also should be shown.

[57] Significant materials include, "* * * but [are] not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; * * * hazardous substances designated under section 101(14) of CERCLA; any chemical facilities required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharge" (40 CFR 122.26(b)(12)). Significant materials commonly found at mining facilities include: overburden; raw materials; waste rock piles; tailings; petroleum based products; solvents and detergents; heap leach pads; tailings piles/ponds, both proposed and existing; and manufactured products, waste materials or by-products used or created by the facility.

TABLE G–5.—INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Chemical Oxygen Demand (COD)	120 mg/L
Total Suspended Solids (TSS)	100 mg/L
Nitrate plus Nitrite Nitrogen	0.68 mg/L

If the average concentration for a parameter is less than or equal to the value listed in Table G–5, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table G–5, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit.

TABLE G–6.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table G–5, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table G–5, then no further sampling is required for that parameter.
4th Year of Permit Coverage.	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table G–5. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut off concentrations listed in Table G–5 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities which submitted Part 2 data, reported concentrations greater than or equal to the values listed in Table G–5. Facilities that achieve average discharge concentrations which are less than or equal to the values in Table G–5 are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of the monitoring reports required under paragraph *c* below, under penalty of law, signed in accordance with Part VII.G. of the permit (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in accordance with Part VI.C. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (*b*) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding

measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one such outfall and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

F. Visual Examination of Storm Water Quality. Metal mining facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination of storm water quality must be conducted at least once in each of the following 3-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the storm water pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

(5) EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

7. Numeric Effluent Limitations.

There are no numeric effluent limitations beyond those described in Part VI.B. of this permit.

H. Storm Water Discharges Associated With Industrial Activity From Coal Mines and Coal Mining-Related Facilities

1. Discharges Covered Under This Section

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water associated with industrial activity." This definition includes point source discharges of storm water from eleven major categories of facilities, including: "* * * (iii) facilities classified as Standard Industrial Classification (SIC) codes 10 through 14 including active or

inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of noncoal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or storm water contaminated by contact with any overburden, raw material, intermediate products, finished products, by-products or waste products located on the site of such operations."

This section only covers storm water discharges associated with industrial activities from inactive[58] coal mines and from access roads, haul roads, and rail lines at active coal mines. Coal mines and coal mining-related facilities subject to requirements under this section include the following types of operations: bituminous coal and lignite surface mining (SIC 1221); bituminous coal underground mining (SIC 1222); anthracite mining (SIC 1231); and coal mining services (SIC 1241).

Storm water discharges authorized by this section include storm water discharges at inactive coal mines where precipitation and storm water runon come into contact with significant materials including, but not limited to, raw materials, waste products, and by-products, overburden, and stored materials. This section also authorizes storm water discharges from haul roads, access roads, and rail lines used or traveled by carriers of raw materials, manufactured products, waste materials, or by-products created by active coal mining facilities. The following activities are covered under this section:

Haul Roads—Nonpublic roads on which coal or coal refuse is conveyed

Access Roads—Nonpublic roads providing light vehicular traffic within the facility property and to public roadways

Railroad Spurs, Sidings, and Internal Haulage Lines—Rail lines used for hauling coal within the facility property and to offsite commercial railroad lines or loading areas

Conveyor Belts, Chutes, and Aerial Tramway Haulage Areas—Areas under and around coal or refuse conveyor areas, including transfer stations

Equipment Storage and Maintenance Yards

Coal Handling Buildings and Structures

Inactive Coal Mines and Related Areas—Abandoned and other inactive mines, refuse disposal sites and other mining-related areas. This includes abandoned mine sites being reclaimed under Title IV of the Surface Mining Control and Reclamation Act. Not covered by this section are discharges from sites, or parts of sites, which are determined to cause or contribute to water quality standards violations.

This section does not cover any discharge subject to effluent limitation guidelines. Discharges from active facilities and those under reclamation are subject to NPDES permits and require treatment to meet specific effluent guideline limits as specified in 40 CFR Part 434 for pH, iron, manganese, suspended solids, and settleable solids. Storm water that does not come into contact with any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation are not subject to permitting under this section according to Section 402(l)(2) of the Clean Water Act.

This section also does not cover storm water discharges associated with industrial activity from inactive coal mines located on Federal lands, unless an operator can be identified. These discharges are not eligible because they are more appropriately covered under an NPDES permit currently being developed.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Coal is a black, primarily organic substance formed from compressed layers of decaying organic matter millions of years ago.[59] Factors such as the fixed carbon content, volatile matter fraction, and heating value, determine whether coal is classified as lignite, subbituminous, bituminous, or anthracite. The coal mining and related facilities industry extracts and processes coal. There are two methods of coal mining: surface mining and underground mining. Surface mining is a method utilized when the coal is close to the earth's surface and it is economically viable to remove and store the overburden, which can later be used for reclamation. Underground mining occurs when coal is too deep to be surface mined or environmental restrictions prohibit surface mining.

Coal preparation activities increase the value of coal by removing impurities through size reduction, screening, gravity separation, dewatering, and drying. After this step, coal is ready to be shipped for further processing. The impurities, including shales, clays, low reject coal, and possibly some acidic materials, are then conveyed to refuse disposal facilities.

These mining methods and coal preparation activities occur during the active phase of mining and are not authorized by this section nor are they included in the storm water regulation. Most areas at active mine sites are covered by the Surface Mining Control and Reclamation Act (SMCRA). Discharges from these areas are considered process wastewaters and are covered under a separate NPDES permit. Today's permit only addresses storm water discharges from coal mines and related areas that are not already subject to effluent limitation guidelines under 40 CFR Part 434. Storm water discharges not subject to the effluent limitation guidelines may include discharges from the following areas:

a. Access Roads, Haul Roads, and Rail Lines. Access roads, haul roads, and rail lines are used for the transportation of coal, refuse (waste materials, old equipment, etc.), and overburden away from the mine workings. To build access and haul roads, common land disturbing activities such as vegetation clearing and soil grading are necessary. Refuse coal and overburden may be used as a road base material. Road building activities increase the potential for the offsite discharge of sediment in storm water runoff. In addition, coal, overburden, and refuse materials may be spilled during loading and unloading operations and during the transport of such materials along access roads, haul roads, and rail spurs.

b. Inactive Mine Sites. Although industrial processes have ended at inactive mine sites, the significant materials associated with those

[58] Inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator.

[59] "Development Document for Final Effluent Limitations Guideline, New Source Performance Standards, and Pretreatment Standards for the Coal Mining Point Source Category." EPA. 1982.

industrial processes may remain at the site and contaminate storm water discharges. The areas at inactive surface or underground coal mines which are included in the storm water regulation include former locations of: conveyor belts, chutes, and aerial tramways; equipment storage and maintenance yards; coal preparation plants; and coal handling buildings and storage areas.

Inactive mine sites are regulated because significant materials remain onsite. The significant materials include, but are not limited to: coal piles, including coal refuse piles; used and old equipment, including boneyards; overburden; waste disposal sites; and waste materials. In addition, in certain areas where machinery has been intensively used or abandoned, waste lubricating fluids, solvents, and contaminated soils may be present. These materials are typically present outdoors and are exposed to storm water discharges.

2. Pollutants Found in Storm Water Discharges

Impacts caused by storm water discharges from active haul roads, access roads and rail lines and inactive coal mine and coal mining-related facilities will vary. Several factors influence to what extent significant materials from coal mines and coal mining-related facilities may affect water quality. Such factors include: geographic location; hydrogeology; the type of coal extracted; the mineralogy of the extracted resource and the surrounding rock; how the coal was extracted; the type of industrial activities occurring onsite; the size of the operation; and type, duration, and intensity of precipitation events. Each of these, and other, factors will interact to influence the quantity and quality of storm water runoff. For example, overburden may be a significant source of pollutants at some facilities, while storage areas are a primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections,[60] spills, and other improperly dumped materials, may increase the pollutant loads discharged into waters of the United States.

Storm water discharges from haul roads of active sites and inactive mine sites may include many of the pollutants common to active coal mining operations. These pollutants may include acids, suspended solids, dissolved solids, iron, manganese, and traces of other metals. Table H–1 indicates the pollutant sources and pollutants for a number of industrial activities for coal mines authorized by this section.

Another problem at coal mines is acid mine drainage. In general, the problems of acid mine drainage are confined to western Maryland, northern West Virginia, Pennsylvania, western Kentucky, and along the Illinois-Indiana border. Acid mine drainage is not a problem in the West because the coals and overburden contain little pyrite, the precursor for acid mine drainage, and because of low annual precipitation.

TABLE H–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS

Activity	Pollutant source	Pollutant
Road and Rail Construction and Maintenance—Active Sites.	Surface grading and exposure of soils	Dust, TSS, TDS, turbidity, pH.
Raw or Waste Material Transportation.	Material spills	Dust, TSS, TDS, turbidity, pH, sulfates, iron.
Location of Mining and Processing Activities at Inactive Coal Mines.	Raw Material Storage	Dust, TSS, TDS, turbidity, pH sulfates, iron.
	Waste Rock Storage	Dust, TSS, TDS, turbidity, sulfates, iron, pH.
	Disposal Areas	Dust, TSS, TDS, turbidity, pH, oil & grease.
	Surface and Underground Mines	Dust, TSS, TDS, turbidity, pH, sulfates, iron.
	Materials Handling and Loading/Unloading	Dust, TSS, TDS, turbidity, pH, sulfates, iron.
Equipment/Vehicle Maintenance.	Fueling Activities	Diesel fuel, gasoline, oil, COD.
	Parts Cleaning	Solvents, oil, heavy metals, acid/alkaline wastes.
	Waste disposal of oily rags, oil and gas filters, batteries, coolants, degreasers.	Oil, heavy metals, solvents, acids, COD.
Reclamation Activities	Site preparation for stabilization	Dust, TSS, TDS, turbidity.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at coal mining facilities as a whole and not subdivide this sector. Therefore, Table H–2 lists data for selected parameters from facilities in the coal mining sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F, as well as the pollutants that EPA determined merit further monitoring.

TABLE H–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY COAL MINES AND COAL MINING-RELATED FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant / Sample type	No. of Facilities		No. of Samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	16	7	19	8	3.1	3.5	0.0	0.0	9.0	17.4	3.0	1.0	15.0	14.4	33.1	33.9
COD	21	11	25	12	22.9	18.8	0.0	0.0	275.0	115.0	0.0	4.0	102.0	86.9	237.5	184.6
Nitrate + Nitrite Nitrogen	17	10	20	10	0.38	0.68	0.00	0.00	3.12	3.12	0.00	0.17	1.85	3.55	3.45	8.60
Total Kjeldahl Nitrogen	18	11	21	12	1.55	1.78	0.00	0.00	5.20	7.40	0.66	0.39	10.33	10.25	32.01	31.31
Oil & Grease	27	N/A	31	N/A	1.7	N/A	0.0	N/A	13.9	N/A	1.0	N/A	6.5	N/A	13.6	N/A
pH	29	N/A	33	N/A	N/A	N/A	5.9	N/A	8.9	N/A	7.0	N/A	8.6	N/A	9.3	N/A
Total Phosphorus	18	9	20	9	0.36	0.08	0.00	0.00	5.90	0.58	0.00	0.00	1.40	0.61	5.00	1.37

[60] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at coal mines and coal mining related facilities is low yet it still may be applicable at some operations.

TABLE H–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY COAL MINES AND COAL MINING-RELATED FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)—Continued

Pollutant Sample type	No. of Facilities		No. of Samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
Total Suspended Solids	18	11	22	12	2551	462	0	2	33420	3880	7	131	3167	3011	23454	13634
Aluminum, Total	7	4	9	6	87.38	8.28	0.00	0.10	517.58	38.84	5.72	2.33	898.16	54.11	6089.45	198.54
Iron, Total	11	9	13	10	193.9	53.3	0.6	1.1	930.0	294.0	9.2	11.0	1639.1	284.0	9593.9	981.7

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

Storm water discharges from inactive and abandoned coal mines, preparation, refuse disposal sites, haul roads and other inactive mining-related areas may contain substantial amounts of pollutants without the benefits of sediment and erosion control measures. Sampling data in the EPA 1982 "Development Document for Effluent Guidelines and Standards for Coal Mining" reveal typical ranges for untreated mine drainage and are indicated in Table H–3. The data are based on untreated surface and underground drainage and may not be typical of inactive sites subject only to storm water runoff. For example, a high proportion of underground mines in the survey may have resulted in the relatively low median levels of suspended solids. However, it does indicate the potential array of conventional mining pollutants which could be present in abandoned mine drainage.

3. Options for Controlling Pollutants

Mining facilities are often dissimilar to other types of industrial facilities because they may be situated in remote locations, operate only seasonally or intermittently, yet need year-round storm water management controls. EPA believes that the most effective storm water management controls for limiting the offsite discharge of storm water pollutants from active and inactive coal mines are source reduction BMPs. Source reduction BMPs are methods by which discharges of contaminants are controlled with little or no required maintenance. Examples of these types of controls include diversion dikes, vegetative covers, and berms. Source reduction practices are typically (but not always) low in cost and relatively easy to implement. In some instances, more resource intensive treatment BMPs, including sedimentation ponds and infiltration trenches, may be necessary depending upon the type of discharge, types and concentrations of contaminants, and volume of flow.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with active and inactive coal mines.

BMPs that minimize erosion and sedimentation are effective for areas along haul and access roads, and for inactive mines. Many BMPs were not listed by part 1 group application participants because the major application submitted by the National Coal Association and the American Mining Congress was comprised of only active mine sites. The only portions of an active mine site to which this section of today's permit applies are haul roads, railways, and conveyor belts, chutes, and aerial tramway haulage areas. Because the scope of storm water program, as it applies to active coal mining sites, is limited, the applicants were not required to provide EPA with BMP data for process wastewater discharges. Furthermore, active surface mines are subject to 30 CFR Part 816 and active underground mines are subject to 30 CFR Part 817, both which require the implementation of BMPs.

Since many coal facilities are required to have BMPs, the data presented in part 1 of the application may underestimate the percentage of facilities with storm water BMPs.

Because BMPs described in the part I data are limited, EPA is providing an overview of supplementary BMPs for use by facility operators to determine appropriate BMPs for haul and access roads at active coal mines and for inactive coal mines. However, due to the site-specific nature of facilities within this sector, BMPs cited do not preclude the use of other viable BMP options. Table H–3 summarizes BMP options as they apply to land disturbance activities at active and inactive coal mining facilities. Sources of BMP information include: "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990; "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September, 1992, (EPA 832–R–92–006); "Best Management Practices for Mining in Idaho," Idaho Department of Lands, November 1992; and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.

TABLE H–3.—SUMMARY OF MINE AREAS AND APPLICABLE BEST MANAGEMENT PRACTICES

Land-disturbed area	Discharge diversions	Conveyance systems	Runoff dispersion	Sediment control & collection	Vegetation	Containment
Haul Roads and Access Roads.	Dikes, Curbs, Berms..	Channels, Gutters, Culverts, Rolling Dips, Road Sloping, Roadway Water Deflectors.	Check Dams, Rock Outlet Protection, Level Spreaders, Stream Alteration, Drop Structures.	Gabions, Riprap, Native Rock Retaining Walls, Straw Bale Barriers, Sediment Traps/Catch Basins, Vegetated Buffer Strips.	Seeding, Willow Cutting Establishment.	

TABLE H-3.—SUMMARY OF MINE AREAS AND APPLICABLE BEST MANAGEMENT PRACTICES—Continued

Land-disturbed area	Discharge diversions	Conveyance systems	Runoff dispersion	Sediment control & collection	Vegetation	Containment
Pits/Quarries or Underground Mines.	Dikes, Curbs, Berms.	Channels, Gutters	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Sediment Settling Ponds, Straw Bale Barrier, Siltation Berms.	Seeding	Plugging and Grouting.
Overburden, Waste Rock and Raw Material Piles.	Dikes, Curbs, Berms.	Channels, Gutters	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Plastic Matting, Plastic Netting, Erosion Control Blankets, Mulch-straw, Compaction, Sediment/Settling Ponds, Silt Fences, Siltation Berms.	Topsoiling, Seedbed Preparation, Seeding.	Capping.
Reclamation	Dikes, Curbs, Berms.	Channels, Gutters	Check Dams, Rock Outlet Protection, Level Spreaders, Serrated Slopes, Benched Slopes, Contouring, Drain Fields, Stream Alteration, Drop Structures.	Gabions, Riprap, and Native Rock Retaining Walls, Biotechnical Stabilization, Straw Bale Barriers, Sediment Traps/Catch Basins, Vegetative Buffer Strips, Silt Fences, Siltation Berms, Brush Sediment Barriers.	Topsoiling, Seedbed Preparation, Seeding, Willow Cutting Establishment.	Capping, Plugging and Grouting.

Haul Roads and Access Roads—Placement of haul roads or access roads should occur as far as possible from natural drainage areas, lakes, ponds, wetlands or floodplains where soil will naturally be less stable for heavy vehicle traffic. If a haul road must be constructed near water, as little vegetation as possible should be removed from between the road and the waterway, as vegetation is a useful buffer against erosion and is an efficient sediment collection mechanism. The width and grade of haul or access roads should be minimal and should be designed to match natural contours of the area. Construction of haul roads should be supplemented by BMPs that divert runoff from road surfaces, minimize erosion, and direct flow to appropriate channels for discharge to treatment areas. Existing haul roads and nearby ditches, without BMPs, can be altered or modified to accommodate the construction of BMPs.

Surface Mines—BMPs can be used to control total suspended solids levels in runoff from unvegetated areas. These can include sediment/settling ponds, check dams, silt fences, and straw bale barriers.

Overburden, Waste Rock, and Raw Material Piles—Overburden, topsoil, and waste rock should be stabilized, recontoured if necessary, and vegetated. In addition surface waters and other sources of water should be diverted around the piles. As many piles as possible should be revegetated (even if only on a temporary basis).

Reclamation Activities—When a coal seam is depleted and operations cease, a mine site must be reclaimed according to appropriate State or Federal standards. Closure activities typically include restabilization of any disturbed areas such as access or haul roads, pits or quarries, sedimentation ponds or work-out pits, and any remaining waste piles. Overburden and topsoil stockpiles may be used to fill in a pit or quarry (where practical.) Recontouring and vegetation should be performed to stabilize soils and prevent erosion.

Major reclamation activities such as recontouring roads and filling in a pit or quarry can only be performed after operations have ceased. However, reclamation activities such as stabilization of banks, and reseeding and revegetation should be implemented in mined out portions, or inactive areas of a site as active mining moves to new areas.

The following seven categories describe best management practice options for reducing pollutants in storm water discharges from haul and access roads for active coal mines and for inactive mines: discharge diversions; drainage/storm water conveyance systems; runoff dispersion; sediment control and collection; vegetation/soil stabilization; capping of contaminated sources; and treatment.

a. Discharge Diversions. Discharge diversions provide the first line of defense in preventing the contamination of discharges, and subsequent contamination of receiving waters of the United States. Discharge diversions are temporary or permanent structures installed to divert flow, store flow, or limit storm water runon and runoff.

These diversion practices have several objectives. First, diversion structures can be designed to prevent otherwise uncontaminated (or less contaminated) water from crossing disturbed areas or areas containing significant amounts of contaminated materials, where contact may occur between runon and significant materials. These source reduction measures may be particularly effective for inactive coal mine sites

because they prevent runon of uncontaminated discharges from contacting exposed materials and/or reduce the flow across disturbed areas, thereby lessening the potential for erosion. Second, diversion structures can be used to collect or divert waters for later treatment, if necessary. The usefulness of these control measures are limited by such factors as the size of the area to be controlled and the type and nature of materials exposed and precipitation events.

Diversion dikes, curbs, and berms are temporary or permanent diversion structures that prevent runoff from passing beyond a certain point, and divert runoff away from its intended path. Dikes, curbs or berms may be used to surround and isolate areas of concern, diverting flow around piles of overburden, waste rock, and storage areas, to minimize discharge contact with contaminated materials and to limit discharges of contaminated water from confined areas.

b. Drainage/Storm Water Conveyance Systems. Drainage or storm water conveyance systems can provide either a temporary or a permanent management practice which functions to channel water away from eroded or unstabilized areas, convey runoff without causing erosion, and/or carry discharges to more stabilized areas. The use of drainage systems as a permanent measure may be most appropriate in areas with extreme slopes, areas subject to high velocity runoff, and other areas where the establishment of substantial vegetation is infeasible or impractical. For instance, several BMPs described below may be useful storm water and erosion control methods applicable to haul roads and access roads.

Channels or Gutters—Channels or gutters collect storm water runoff and direct its flow. Like diversion systems, channels or gutters may act to divert runoff away from a potential source of contamination, but may also be used to channel runoff to a collection and/or treatment area including settling ponds, basins or work-out pits.

Open Top Box Culverts, and Waterbars—These structures are temporary or permanent structures that divert water from a roadway surface. Open top box culverts may be used on steeply graded, unpaved roads in place of pipe culverts to divert surface runoff and flow from inside ditches onto the downhill slope of a road. These structures are typically made of wood and should periodically be monitored and repaired if necessary.

Waterbars are berms built by a dozer, or by hand, to a one to two foot height. They serve to extend the entire width of the road, with a downslope angle between 30 and 40 percent. Waterbars are kept open at a discharge end to allow water to flow away from the road, and require little maintenance. These berms may be used as temporary or permanent structures.

Rolling Dips and Road Sloping—. Rolling dips and road sloping are permanent water diversion techniques installed using natural contours of the land during road construction. These BMPs prevent water accumulation on road surfaces and divert surface runoff toward road ditches, which then convey the storm water to ponds or other management areas.

Roadway Surface Water Deflector—A roadway surface water deflector is another technique to prevent accumulation of water on road surfaces. The structure uses a conveyor belt sandwiched between two pieces of treated wood and placed within the road to deflect water. This is a useful technique for steeply graded, unpaved roads.

Culverts—Culverts are permanent surface water diversion mechanisms used to convey water off of, or underneath a road. Made of corrugated metal, they must extend across the entire width of the road, and beyond the fill slope. Additional erosion control mechanisms may need to be installed at the discharge end of the culvert.

c. Runoff Dispersion. Drainage systems are most effective when used in conjunction with runoff dispersion devices designed to slow the flow of water discharged from a site. These devices also aid storm water infiltration into the soil and flow attenuation. Some examples of velocity dissipation devices include check dams, rock outlet protection, level spreaders, and serrated and benched slopes.

Check Dams—Check dams are small temporary dams constructed across swales or drainage ditches to reduce the velocity of runoff flows, thereby reducing erosion and failure of the swale or ditch. This slowing reduces erosion and gullying in the channel and allows sediments to settle.

Check dams may be installed in small temporary or permanent channels where vegetation of the channel lining is not feasible and where there is danger of erosion. These may be areas where installation of nonerosive liners are not cost effective.

Check dams diminish the need for more stringent erosion control practices in the drainage ditch since they decrease runoff velocity. When constructing check dams, the use of overburden or waste rock should be avoided where there is the potential for contamination.

Rock Outlet Protection—Rock protection placed at the outlet end of culverts, channels, or ditches reduces the depth, velocity, and destructive energy of water such that the flow will not erode the downstream reach. The use of some materials (e.g., mine waste rock or ore) should be avoided where contamination may occur. As with check dams, rock outlet protection may also be used as a source reduction treatment mechanism by using rocks containing limestone or other alkaline materials to neutralize acidic discharges.

Level Spreaders—Level spreaders are outlets for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. Level spreaders diffuse storm water point sources and release it onto areas stabilized by existing vegetation.

Serrated Slopes and Benched Slopes—These runoff dispersion methods break up flow of runoff from a slope, decreasing its ability to erode. Serrated and benched slopes provide flat areas that allow water to infiltrate, and space for vegetation to grow and reinforce soils. Serrated slopes are equipped with small steps, from one to two feet of horizontal surface exposed on each step. Benched slopes have larger steps, with vertical cuts between two and four feet high.

Contouring—Surface contouring is the establishment of a rough soil surface amenable to revegetation, through creating horizontal grooves, depressions, or steps that run with the contour of the land. Slopes may also be left in a roughened condition to reduce discharge flow and promote infiltration. Surface roughening aids in the establishment of vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold and grow. This technique is appropriate for all slopes steeper than 3:1 in order to facilitate stabilization of the slope and promote the growth of a vegetative cover. Once areas have been contoured, they should be seeded as quickly as possible.

Drain Fields—Drain fields are used to prevent the accumulation of water and/or ground water at a site, by diverting infiltrating sources through gravity flow or pumping. Typically filled with porous, permeable materials such as graded rock, or perforated pipe, and lined with geotextile fabric, these mechanisms are useful underneath significant materials, reducing the amount of water that ultimately comes into contact with significant materials.

Stream Alteration—Altering or channelizing the path of a stream to bypass all or some disturbed areas on a site, allows additional mining activities, and avoids contamination of stream water by disturbed lands. This practice is complicated, however, by the need to restore the channel when mining operations end.

Drop Structures—Drop structures are large angular rocks placed in a V-shaped pattern to slow the velocity of storm water runoff. These structures are typically reinforced by logs or large rocks imbedded in the streambanks.

d. Sediment Control and Collection. Sediment control and collection limits movement and retains sediments from being transported offsite. Several structural collection devices have been developed to remove sediment from runoff before it leaves the site. Several methods of removing sediment from site runoff involve diversion mechanisms previously discussed, supplemented by a trapping or storage device. Structural practices typically involve filtering diffuse storm water flows through temporary structures such as straw bale dikes, silt fences, brush barriers or vegetated areas.

Structural practices are typically low in cost. However, structural practices require periodic removal of sediment to remain functional. As such, they may not be appropriate for permanent use at inactive mines. However, these practices may be effectively used as temporary measures along haul roads and access roads.

Plastic Matting, Plastic Netting, and Erosion Control Blankets—These BMPs are used to protect bare soils to control dust and erosion. Mats and blankets help to promote vegetative growth by maintaining moisture and heat within the soil. Plastic matting and netting improve slope stabilization and may be used as a permanent treatment to encourage grass growth. Plastic netting is a more effective material to use while promoting growth of vegetation as it permits sunlight to penetrate through to the soils. Erosion control blankets also stabilize slopes, and control erosion. These blankets may be made of jute, or plastic netting, but are more expensive than straw.

Mulch-straw or Wood Chips—Mulches and wood chips are useful temporary covers for bare or seeded soils, with an erosion control effectiveness rating of 75 to 98 percent.[61] Like matting, mulch-straw or wood chips help soils retain moisture and warmth to promote vegetative growth. Used on slopes and/or in combination with nylon netting, these materials may prevent erosion by wind and water. Over time, however, the mulch cover will decrease in effectiveness.

Compaction—Soil compaction using a roller or other heavy equipment increases soil "strength" by increasing its density. More dense soil is less prone to erosion and long-term soil settlement. The surface of compacted soils should be roughed and seeded or vegetated to increase its durability.

Sediment/Settling Ponds—Sediment ponds function as sediment traps by containing runoff for long periods of time, allowing suspended solids to settle. These structures can achieve a high removal rate of sediment for both process wastewater and storm water discharges. Sediment/settling ponds are easily constructed and require minimal maintenance. Their flexibility to treat both process wastewater and storm water makes the use of ponds a desirable treatment for discharges from ore mining and dressing facilities. Of course, site characteristics must be such that some or all discharges can be practically channeled to a centralized area for treatment. Where this is not practical, the cost of constructing multiple sediment ponds may become prohibitive. In addition, periodic dredging may be required in order to maintain the capacity of these ponds.

Discharge ponds may also be designed to act as surge ponds which are designed to contain storm surges and then completely drain in about 24 to 40 hours, and remain dry during times of no rainfall. They can provide pollutant removal efficiencies that are similar to those of detention ponds.[62] Storm surge ponds are typically designed to provide both water quality and water quantity (flood control) benefits.

Gabions, Riprap, and Native Rock Retaining Walls—These BMPs are all forms of slope stabilization. Gabions consist of rocks (riprap) contained by rectangular wire boxes or baskets for use as permanent erosion control structures. Riprap consists of loose rocks placed along embankments to prevent erosion. Native rock retaining walls are another form of slope stabilization, with walls up to five feet in height, constructed from native rock to reinforce a steep slope.

Biotechnical Stabilization—Biotechnical stabilization uses live brush imbedded in the soils of a steep slope to prevent erosion. This method relies on the premise that the imbedded vegetation will eventually take root and help stabilize the slope.

Straw Bale Barrier—Straw bales may be used as temporary berms, barriers, or diversions, capturing sediments and filtering runoff. When installed and maintained properly, these barriers remove approximately 67 percent of the sediment load.[63] These barriers are applicable across small swales, in ditches, and at the toe of bare slopes where there is a temporary, large volume of sediment laden runoff.

Sediment Traps or Catch Basins—These temporary or permanent structures are useful for catching and storing sediment laden storm water runoff and are particularly useful during construction activities to contain runoff. The effectiveness of these BMPs is better in smaller drainage basin areas. Sediment traps are less than 50 percent effective in removing sediment from storm water runoff.[64]

Vegetated Buffer Strips—The installation of vegetated buffer strips will reduce runoff and prevent erosion at a removal efficiency rate of 75 to 99 percent depending upon the ground cover.[65] In addition, vegetated buffer strips catch and settle sediment contained in the storm water runoff prior to reaching receiving waters.

Silt Fence/Filter Fence—A low fence made of filter fabric, wire and steel posts, should be used on small ephemeral drainage areas where storm water collects or leaves a mine site. Silt fences remove 97 percent of the sediment load and are easier to maintain and remove without creating lasting impacts to the environment.[66] Silt and filter fences need to be inspected periodically, and may not be as effective as straw bales, since fabric may become clogged with fine particles preventing water flow.

Silt fences may have limited applicability for large areas: they are most effective for use in small drainage areas. These fences may also be used in conjunction with nonstructural practices to maintain the integrity of soil prior to the establishment of vegetation.

Siltation Berms—Siltation berms are typically placed on the downslope side of a disturbed area to act as an impermeable barrier for the capture and

[61] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990.

[62] "Urban Targeting and BMP Selection," EPA, Region V, November 1990.

[63] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–74.

[64] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–26.

[65] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–7.

[66] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–75.

retention of sediments in surface water runoff. Plastic sheeting is typically used to cover the berm. The berm and the plastic sheeting may require periodic maintenance and repair.

Brush Sediment Barriers—Brush barriers are temporary sediment barriers composed of tree limbs, weeds, vines, root mat, soil, rock and other cleared materials placed at the toe of a slope. A brush barrier is effective only for small drainage areas, usually less than ¼ acre, where the slope is minimal.

Brush barriers do not function as permanent barriers since over time the barrier itself will degrade. This BMP is most effective when located at the toe of a slope of an area in which vegetation is being grown or during temporary operations. The brush barriers remove any excessive sediment which is generated by erosion prior to the establishment of vegetation.

e. Vegetation Practices. Vegetation practices involve establishing a sustainable ground cover by permanent seeding, mulching, sodding, and other such practices. A vegetative cover reduces the potential for erosion of a site by: absorbing the kinetic energy of raindrops which would otherwise impact soil; intercepting water so it can infiltrate into the ground instead of running off and carrying contaminated discharges; and by slowing the velocity of runoff to promote onsite deposition of sediment. Vegetative controls are often the most important measures taken to prevent offsite sediment movement, and can provide a six-fold reduction in the discharge of suspended sediment levels.[67] Permanent seeding has been found to be 99 percent effective in controlling erosion for disturbed land areas.[68]

Typically, the costs of vegetative controls are low relative to other discharge mitigation practices. Given the limited capacity to accept large volumes of runoff, and potential erosion problems associated with large concentrated flows, vegetative controls should typically be used in combination with other management practices. These measures have been documented as particularly appropriate for mining sites.

Topsoiling, Seedbed Preparation—The addition of a layer of topsoil or plant growth material provides an improved soil medium for plant growth. Seedbed preparation may include the addition of topsoil ingredients to be mixed in with soils used for seedbed preparation. Ripping, dicing, and mixing soils promotes weed control and aerates the soil, encouraging seedling growth.

Broadcast Seeding and Drill Seeding—Seeding and vegetative planting are methods used to revegetate an area. Broadcast seeding spreads seeds uniformly, by hand or machine, to steep sloped or rocky areas, flat surfaces, and areas with limited access. Drill seeding is performed using a rangeland drill seeder and may not be used on rocky surfaces. Drill seeding is more suitably performed on flat, nonrocky surfaces, where the machine can insert seeds into the soil.

Willow Cutting Establishment—Willow cutting establishment describes a method of soil stabilization useful for stream banks and other areas located adjacent to water. Similar to biotechnical stabilization, willow cuttings are used to promote growth in an area needing stabilization. Willow cuttings are typically used to reinforce a streambank or other moist area. Willow cuttings require a great deal of moisture and must be planted in areas that remain moist for long periods in order to take hold and grow.

F. Capping. In some cases, the elimination of a pollution source through capping contaminant sources may be the most cost effective control measure for some discharges from inactive coal mines. Depending on the type of management practices chosen the cost to eliminate the pollutant source may be very high. Once completed, however, maintenance costs will range from low to nonexistent.

Capping or sealing of waste materials is designed to prevent infiltration, as well as to limit contact between discharges and potential sources of contamination. Ultimately, capping should reduce or eliminate the contaminants in discharges. In addition, by reducing infiltration, the potential for seepage and leachate generation may also be lessened.

The use of this practice depends on the level of control desired, the materials available, and cost considerations. Many common liners may be effective including common soil, clay, and/or synthetic liners. Generally, soil liners will provide appreciable control for the lowest cost. Synthetic or clay liners may be appropriate to cover materials known to have a significant potential to impact water quality.

EPA has identified a wide variety of best management practices (BMPs) that may be used to mitigate discharges of contaminants at coal mines. Many of the practices focus on sediment and erosion control and are similar to BMPs used in the construction industry. For more details on the use and implementation of these practices the reader is encouraged to obtain a copy of one or more of the many good sediment and erosion control books available on the market.[69] In some cases (e.g., low pH and/or high metals concentrations), BMPs, and sediment and erosion controls may not be adequate to produce an acceptable quality of storm water discharge. Under those circumstances additional physical or chemical treatment systems may be necessary to protect the receiving waters.

g. Treatment. Treatment practices are those methods of control which are normally used to reduce the concentration of pollutants in water before it is discharged. This is in contrast to many BMPs where the emphasis is on keeping the water from becoming contaminated. Treatment practices may be required where flows are currently being affected by exposed materials and where other BMPs are insufficient to meet discharge goals. These practices are usually the most resource intensive as they often entail significant construction costs and require monitoring and maintenance on a frequent and regular basis. Treatment options may range from high maintenance controls to low maintenance. High maintenance treatment techniques require periodic manpower to operate and maintain the BMP. Low maintenance cost techniques have initial capital costs but operate with little long-term maintenance after they are implemented. At a few sites, treatment measures other than high maintenance measures may be appropriate to address specific pollutants.

Chemical/Physical Treatment—An example of a high maintenance technology that is found at coal mining facilities is chemical/physical treatment. The most common type of chemical/physical treatment involves the addition of limestone to reduce the acidity of the discharge and/or precipitate metals. Metals may be removed from wastewater by raising the pH of the wastewater to precipitate them out as hydroxides. Typically, the pH of the wastewater must be raised to 9 to 12 standard units in order to achieve the

[67] "Performance of Current Sediment Control Measures at Maryland Construction Sites," January 1990, Metropolitan Washington Council of Governments, page X.

[68] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–4.

[69] "Best Management Practices for Mining in Idaho," Idaho Department of State Lands, November 1992; "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September 1992, (EPA 832–R–92–005); and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.

desired precipitation of metals. After metals precipitation, the addition of some form of acid or carbon dioxide may be required to reduce the pH to acceptable levels. Polymer addition may be required to enhance the settling characteristics of the metal hydroxide precipitate. In general, this practice requires significant operator participation to ensure proper neutralization and/or precipitation and thus may not be cost effective for most storm water discharges.

Artificial Wetlands—This type of BMP system is gaining popularity as a method of treating process wastewater from inactive coal mines. They can be an effective system for improving water quality either alone or in conjunction with other treatment practices. The complex hydrologic, biological, physical, and chemical interactions that take place within a wetland result in a natural reduction and cleansing of influent pollutants. Wetland processes are able to filter sediments, and absorb and retain chemical and heavy metal pollutants through biological degradation, transformation, and plant uptake.

Artificial wetlands are designed to maintain a permanent pool of water. Properly installed and maintained retention structures (also known as wet ponds) and artificial wetlands will be most cost-effective when used to control runoff from larger, intensively developed sites. These artificial wetlands are created to provide treatment but also provide a wildlife habitat, and enhance recreation and landscape amenities. Artificial wetlands are being intensely researched by the Bureau of Mines as a means of mitigating acid mine drainage.

EPA strongly discourages the use of natural wetlands as part of the treatment system because they are considered to be waters of the United States. The necessary controls, or BMPs, must be provided prior to discharging the storm water runoff to natural wetlands or other receiving waters.

In summary, a wide variety of BMPs are available for inactive coal mines and for use along haul roads and access roads at active coal mines. These measures range from simple low cost, low maintenance source reduction practices such as diversion structures to high cost, maintenance intensive practices such as wetlands treatment. Clearly, the selection of a practice or group of practices will be site-specific depending on conditions and potential impacts as well as the resources available at each site. A specific best available technology (or technologies) cannot be determined because of the differences between sites and the quantities and characteristics of their discharges.

4. Storm Water Pollution Prevention Plan Requirements

Specific requirements for the pollution prevention plan for coal mines and coal mining related facilities are described below. These requirements must be implemented in addition to the common pollution plan provisions described in Section VI.C. of this fact sheet.

a. Contents of the Plan. Under the description of potential pollutant sources section, all coal mining and related facilities are required to describe all potential pollutant sources and provide the locations of these sources.

(1) A site map, such as a drainage map required for SMCRA permits, must indicate drainage areas and storm water outfalls from the potential pollutant sources as indicated in item 1 above. The map should provide, but not be limited to, the following information:

(a) Drainage direction and discharge points from all applicable mining-related areas, including culvert and sump discharges from roads and rail beds and also from equipment and vehicle maintenance areas, lubricants and other potentially harmful liquids

(b) Location of each existing erosion and sedimentation control structure and other control measures for reducing pollutants in storm water runoff

(c) Receiving streams or other surface water bodies

(d) Locations exposed to precipitation which contain acidic or metal ladened spoil, refuse, or unreclaimed disturbed areas

(e) Locations where major spills or leaks of toxic or hazardous pollutants have occurred

(f) Locations where liquid storage tanks containing potential pollutants, such as caustics, hydraulic fluids and lubricants, are exposed to precipitation

(g) Locations where fueling stations, vehicle and equipment maintenance areas are exposed to precipitation

The site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

Under the measures and controls section, operators of the inactive and active coal mines are required to describe storm water management controls for coal mining-related facilities, including the following:

(2) Compliance with SMCRA Requirements. The Surface Mining Control and Reclamation Act (SMCRA) regulations require sediment and erosion control measures and practices for haul roads and most of the other active mining-related areas covered by this section. All such SMCRA requirements are also requirements of the pollution prevention plan and other applicable conditions of this section.

(3) Good Housekeeping Practices. The purpose of good housekeeping practices is to remove or lessen the potential pollution sources before they come into contact with storm water. This includes collection and removal of waste oils collected in traps; cleaning up exposed maintenance areas of spilled lubricants and fuels, and similar measures; and preventing the offsite movement of dust by sweeping or by road watering.

(4) Preventive Maintenance. A timely maintenance program should include: inspections for preventing breakdowns, corrosion of tanks and deterioration of pressure fuel or slurry pressure lines; periodic removal and disposal of accumulated solids in sediment traps; and replacement of straw bales and other control measures subject to weathering and deterioration.

(5) Inspections. For all SMCRA regulated active mining-related sites, which include most of the active facilities under this section, SMCRA authorities are required to conduct regular quarterly inspections. Coordinated inspections by the facility representative would be expected to take place either before, during or after the complete SMCRA inspections. Therefore, inspections by the facility representative would not be placing an undue burden on the facility. In addition, sediment and erosion control measures should be evaluated at least once yearly during a storm period of at least 0.1 inch rainfall where effectiveness can be evaluated first hand. Observations should also be made at this time of resulting impact of any settled solids in the receiving stream.

Inactive coal mines should be inspected at least once yearly, except where very remote, to maintain an appraisal of sediment and erosion control measures, determine outstanding problem areas, and plan for improved measures.

(6) Employee Training. There are no employee training requirements beyond those described in Section VI.C.

(7) Prohibition of Non-storm Water Discharges. Many inactive mines and portions of inactive mines are

abandoned underground mines which have seeps or other discharges which are not in response to storm events. These type discharges from inactive mines are not covered by this section. In addition, floor drains from maintenance buildings and other similar drains in mining and preparation plant areas may contain contaminants and are prohibited from inclusion in this section.

(8) Sediment, Erosion and Flow Management Controls. The plan must describe all sediment, erosion, and flow management controls used to control storm water discharges. The plan should also address the reasonableness and appropriateness of each sediment, erosion, and flow management control, and identify when they are required by State or Federal SMCRA regulations. For the most part, these measures are best management practices expected of construction and other activities which are subject to storm runoff. However, construction activities are usually much more short term than mining activities, so greater emphasis must be placed on implementing long term measures for haul roads and other mining-related facilities.

b. Comprehensive Site Compliance Evaluation. In addition to the comprehensive site compliance evaluation described in Section VI.C.4. of this fact sheet, the plan must be implemented and, where erosion control and pollution prevention measures described in the plan are found deficient, the plan must be revised to include reasonable and appropriate control measures. Reports including observations and incidences of noncompliance must be prepared and kept on file for possible review.

5. Numeric Effluent Limitation

Based on the lack of sampling data, it is infeasible for EPA to calculate effluent limitations at this time. The main pollutant concern is excess solids runoff and discharge, but there are no widely accepted solids limits which could be expected from the recommended sediment and erosion control measures. The 0.5 ml/L settleable solids limit, as required by 40 CFR Part 434 for storm discharges from surface mine settling ponds, can be considered a goal but not a requirement for control measures, which for the most part, consist of sediment ditches, straw bales and similar structures normally used for haul roads. The permit does not cover facilities that are in violation of water quality standards and where water quality-based effluent limits apply.

6. Monitoring and Reporting Requirements

a. Monitoring Requirements. EPA believes that coal mining facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, Table H–4 lists the pollutants that coal mining facilities are required to collect and analyze in their storm water discharges. The pollutants listed in Table H–4 were found to be above levels of concern for a significant portion of coal mining facilities that submitted quantitative data in the group application process. Because these pollutants have been reported at benchmark levels from coal mining facilities, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

Permittees can exercise the alternative certification on a pollutant-by-pollutant basis as described under Section (1) below. Any pollutant(s) for which the facility is unable to certify to no exposure must, at a minimum, monitor storm water discharges from coal mining facilities on a quarterly basis during the second year of permit coverage. Monitoring must be performed during the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table H–4. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE H–4.—MONITORING REQUIREMENTS COAL MINING FACILITIES MG/L

Pollutants of concern	Monitoring cut-off concentration
Total Recoverable Aluminum	0.75 mg/L
Total Recoverable Iron	1.0 mg/L
Total Suspended Solids (TSS)	100 mg/L

If the average concentration for a parameter is less than or equal to the appropriate cut-off concentration, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table H–4, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table H–5.

TABLE H–5.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table H–4, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table H–4, then no further sampling is required for that parameter.

TABLE H–5.—SCHEDULE OF MONITORING—Continued

4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table H–4. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will be used to reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut-off concentrations listed in Table H–4 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities which submitted Part 2 data reported concentrations greater than or equal to the values listed in Table H–4. Facilities that achieve average discharge concentrations which are less than or equal to the appropriate cut-off concentration values are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

(1) Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring described in Table H–4, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, and that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in accordance with Part VI.C. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (*2*) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

(2) Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements, an additional Discharge Monitoring Report Form must be filed for each analysis.

(3) Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable, permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

(4) Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

b. Visual Examination of Storm Water Quality. Visual examinations of a storm water discharge from each outfall are required except at inactive areas not under SMCRA bond. Active areas under SMCRA bond that are located in areas with an average annual precipitation greater than 20 inches must perform the visual examinations quarterly. Active areas under SMCRA bond with an

average annual precipitation less than or equal to 20 inches are required to perform visual examinations on a semiannual basis. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each designated period during daylight hours unless there is insufficient rainfall or snow-melt to runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Examinations shall be conducted in each of the following periods for the purposes of inspecting storm water quality associated with storm water runoff and snow melt: January through March; April through June; July through September; October through December. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.). For facilities that have an average annual precipitation of 20 inches or less or are designated inactive by SMCRA, EPA requires semiannual visual examinations instead of quarterly.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examination. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

I. Storm Water Discharges Associated With Industrial Activity From Oil and Gas Extraction Facilities

1. Industry Profile

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with an industrial activity." This definition includes point source discharges of storm water from eleven major categories of facilities, including: "* * * (iii) facilities classified as Standard Industrial Classification (SIC) codes 10 through 14, including * * * oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the site of such operations."

As stated above and at 40 CFR 122.26(b)(14)(iii), only those oil and gas facilities that discharge 'contaminated' storm water are required to submit permit applications under the November 16, 1990, storm water rule. For oil and gas facilities, contamination means that there has been a release of a Reportable Quantity (RQ) of oil or hazardous substances in storm water since November 16, 1987 (hereinafter referred to as 'an RQ release'). Only those facilities that have had an RQ release are required to submit a storm water permit application.

This section of today's permit only covers storm water discharges associated with industrial activities from oil and gas exploration, production, processing, or treatment operations, or transmission facilities. Hereinafter, the facilities listed above will be referred to as "oil and gas facilities." Oil and gas facilities eligible to seek coverage under this section include the following types of operations: crude petroleum and natural gas (SIC Code 1311), natural gas liquids (SIC Code 1321), drilling oil and gas wells (SIC Code 1381), oil and gas field exploration services (SIC Code 1382), oil and gas field services, not elsewhere classified (SIC Code 1389).

These industries include the extraction and production of crude oil, natural gas, oil sands and shale; the production of hydrocarbon liquids and natural gas from coal; and associated oil field service, supply and repair industries. Many of the oil field service facilities may also manufacture oil field equipment. Discharges associated with these manufacturing activities shall be covered by this section if the primary activity of the facility is grouped under Major SIC Group 13.

Pursuant to Section 311 of the Clean Water Act and Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), RQs were established for oil and hazardous substances. As defined at 40 CFR Part 110, an RQ is "the amount of oil that violates applicable water quality standards or causes a film or sheen upon or a discoloration of the surface of the water or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines." The RQs for other substances are listed in 40 CFR 117.3 and 302.4 in terms of pounds released over any 24-hour period.

Discharges covered by this section include all storm water discharges from facilities which have had an RQ release where precipitation and storm water runon come into contact with significant materials including, but not limited to, drilling and production equipment and other machinery, raw materials, waste products, by-products, finished products, stored materials, and fuels. This includes storm water discharges from access roads, and rail lines used or traveled by carriers of raw materials, manufactured products, waste

materials, or by-products created by the facility.

This section does not cover storm water discharges from inactive oil and gas extraction facilities located on Federal lands, unless an operator of the activity can be identified. These discharges are more appropriately covered under a permit currently being developed by EPA.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Oil and gas exploration and production includes all activities related to the search for, and extraction of, liquid and gas petroleum from beneath the earth's surface. Found almost exclusively in sedimentary rocks, oil and natural gas accumulate in geologic confinements called traps which, by virtue of an impermeable overlying layer, have stopped the migration of the fluid. The volume of petroleum contained in a trap can vary from negligible to billions of barrels.

Though at one time such traps may have been close enough to the surface to allow easy detection (i.e., surface seepage), modern exploration relies on sophisticated geophysical testing techniques to locate potentially producible formations. Gravitational and seismic surveys of subsurface geology provide indirect indications of the likelihood of finding promising geological formations. This process is complicated by the fact that, at least in the U.S., the average depth at which one may reasonably expect to find oil is increasing since many of the largest shallow formations are assumed to have been found already.

Drilling operations require construction of access roads, drill pads, mud pits, and possibly work camps or temporary trailers. Drill pads are areas used to stage the drilling operation and generally range from 2 to 5 acres. The pad accommodates the drilling rig and associated operations including pumps, reserve pits, and mud tanks.

Modern well drilling involves the use of a rotary drill to bore through soil and rock to the desired well depth. The drill bit is constantly washed with a circulating drilling fluid, or "mud," which serves to cool and lubricate the bit and remove the cuttings to the surface. The drilling mud also serves to prevent "blowouts" from overpressured water and gas bearing formations. If the drill reaches the desired depth and fails to locate a producible deposit of oil or gas, the well must be plugged and the site abandoned. Even if oil and/or gas is found the well may not be producible. If the formation fails to exhibit the right combination of expected volume, porosity, and permeability, the costs of extraction would be prohibitive.

After a well has been drilled, it is "completed" if well logging data indicate that the well is capable of producing commercial quantities of oil or gas. Completion includes a number of operations that may be necessary to allow the well to produce oil or gas. These include installing and cementing casing, installing the production tubing and downhole equipment, repairing damage that drilling may have caused to the formation, and possibly stimulating the well. During a well's active life, periodic "workovers" are necessary. Workovers can include a number of procedures intended to maintain or enhance production. These can include repairing or replacing downhole equipment, removing accumulated scale or paraffin from tubing or casing, and stimulating the formation to restore or enhance production. Wells are stimulated, whether by treating with acid or fracturing, during completion or workover or both: it is common for wells to be stimulated at completion and then periodically throughout their lives.

Acid stimulation involves introducing an acid solution to the formation. The acid dissolves the rock, thus creating or enlarging flow path openings. Acids are also used to repair damage to formations caused by drilling or other operations. In addition, they may be used for scale removal and other purposes. Fracturing by hydraulic pressure is achieved by pumping fluids at high pressure (i.e., at high rates) into the well, thereby causing material failure of the rock in the formation of interest (i.e., fractures). Fracturing is also done using explosive devices to fire projectiles into the formation of interest. The fractures induced in the formations serve as flow paths for hydrocarbons.

In instances where the reservoir is sufficiently large, "delineation" wells are drilled to determine the boundary of the reservoir and additional "development" wells are drilled to increase the rate of production from the "field." Because few new wells in the U.S. have sufficient energy (pressure) to force oil all the way to the surface, surface or submersible pumps are placed at the wells and production begins.

This first phase of production, primary production, may continue for several to many years, requiring only routine maintenance to the wells as they channel oil to the surface for delivery to refineries. However, as the oil is removed from the formation, the formation pressure decreases until the wells will no longer produce. Because 70 percent of the total recoverable oil may remain in the formation, additional energy may be supplied by the controlled injection of water from the surface into the formation. The injected water acts to push the oil toward the well bores. Such secondary recovery or "water flooding" projects may employ hundreds of injection wells throughout a field to extend the life of the wells. Much of the water used for injection is pumped along with oil from the producing well, separated from the oil, and then reinjected.

Produced fluid, as pumped from a well, is sent through one or more process units to separate the waste fractions (e.g., produced water, emulsions, scale, and produced sand) from the salable hydrocarbon.

As oil and gas are recovered from wells, they are collected or gathered in pipelines for transport to produced fluid treatment facilities. These facilities separate marketable gas and crude oil from water and sand.

Often, service companies are hired by the oil company to perform many of the activities described above. Typically these contractors drill the wells and perform other specific tasks such as installing casing, conducting formation tests, and managing wastes, etc. When a well or field ceases to produce oil or gas at an economically feasible rate, the field must be abandoned and reclaimed.

2. Pollutants in Storm Water Discharges Associated with Oil and Gas Facilities

Exploration and production techniques will vary depending on the type and characteristics of formations, pollutants present, and waste management controls. Therefore, impacts associated with storm water discharges from oil and gas facilities will vary. Several other factors influence to what extent significant materials from these types of facilities and processing operations can affect water quality.

Such factors include: hydrology/geology; the types of chemical additives and lubricating fluids used; the procedure for waste management; the nature and size of the RQ release; the amount of contamination remaining after the RQ release; the size of the operation; and type, duration, and intensity of precipitation events. These and other factors will interact to influence the quantity and quality of storm water runoff. In addition, sources of pollutants other than storm water, such as illicit connections,[70] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Based on information submitted with the group applications and other documents, EPA has identified some storm water pollutants and sources typically associated with oil and gas facilities in Table I–1. Due to distinct industrial activities and materials used at facilities, however, sources and associated pollutants will vary from site to site. The pollutants listed in Table I–1 are not meant to be a comprehensive listing of all potential storm water pollutants at oil and gas facilities.

TABLE I–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS

Activity	Pollutant source	Pollutant
Construction of: —Access Roads —Drill Pads —Reserve Pits —Personnel Quarters —Surface Impoundments	Soil/dirt, leaking equipment and vehicles	TSS, TDS, oil and grease.
Well Drilling	Drilling fluid,[i] lubricants, mud, cuttings, produced water	TSS, TDS, oil and grease, COD, chlorides, barium, naphthalene, phenanthrene, benzene, lead, arsenic, fluoride.
Well Completion/Stimulation	Fluids (used to control pressure in well), cement, residual oil, acids, surfactants, solvents, produced water, sand.	TSS, TDS, oil and grease, COD, pH, acetone, toluene, ethanol xylenes.
Production	Produced water, oil, waste sludge, tank bottoms, acids, oily debris, emulsions.	Chlorides, TDS, oil and grease, TSS, pH, benzene, phenanthrene, barium, arsenic, lead, antimony.
Equipment Cleaning and Repairing.	Cleaning solvents, lubricants, chemical additives	TSS, TDS, oil and grease, pH.
Site Closures	Residual muds, oily debris	TSS, TDS, oil and grease.

[i] The potential contaminants to be found in drilling fluid varies from site to site, depending on the components of the fluid and any pollutants added due to use of the fluid. Storm water discharges that come into contact with used drilling fluids may include the following pollutants, among others: toluene, ethyl benzene, phenol, benzene, and phenanthrene. Used drilling fluids may also contain inorganic pollutants from additives or downhole exposure, such as arsenic, chromium, lead, aluminum, sulfur, and various sulfates.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at oil and gas extraction facilities as a whole and not subdivide this sector. Therefore, Table I–2 lists data for selected parameters from facilities in the oil and gas extraction sector. These data include the eight pollutants that all facilities were required to monitor under Form 2F.

TABLE I–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY OIL AND GAS EXTRACTION FACILITIES SUBMITTING PART II SAMPLING DATA[i] (MG/L)

Pollutant	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	34	32	39	37	13.9	10.7	0.0	0.0	116.0	90.0	10.4	7.0	32.9	26.8	52.9	44.8
COD	35	32	40	35	138.3	112.2	14.0	0.0	1050.0	450.0	78.5	78.0	401.9	330.4	755.3	601.4
Nitrate + Nitrite Nitrogen	34	31	39	35	0.47	0.54	0.00	0.00	5.50	9.90	0.15	0.09	2.06	2.10	6.17	7.15
Total Kjeldahl Nitrogen	35	32	40	34	1.31	1.52	0.00	0.00	9.00	14.50	0.69	0.83	4.68	5.49	9.75	12.56
Oil & Grease	35	N/A	40	N/A	9.4	N/A	0.0	N/A	189.0	N/A	3.0	N/A	24.7	N/A	56.0	N/A
pH	34	N/A	40	N/A	N/A	N/A	5.9	N/A	11.3	N/A	7.2	N/A	9.2	N/A	10.0	N/A
Total Phosphorus	35	32	40	37	16.17	3.98	0.00	0.00	149.72	50.74	0.20	0.16	68.03	20.01	461.08	102.13
Total Suspended Solids	35	32	41	34	332	369	3	1	1657	4186	70	40	1820	1831	6110	7869

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

In evaluating options for controlling pollutants in storm water discharges, EPA must achieve compliance with the technology-based standards of the Clean Water Act [Best Available Technology (BAT) and Best Conventional Technology (BCT)]. The Agency does not believe it is necessary to establish specific numeric effluent limitations or a specific design or performance standard in this section for storm water discharges associated with industrial activity from oil and gas facilities to meet the BAT/BCT standards of the Clean Water Act. Rather than setting limits, this section establishes requirements for the development and implementation of a site-specific storm water pollution prevention plan consisting of a set of BMPs that are sufficiently flexible to address different sources of pollutants at different sites.

[70] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at mineral mining and processing facilities is low yet it still may be applicable at some operations.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, geology/hydrology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with facilities in this category.

Two types of BMPs which may be implemented to prevent, reduce or eliminate pollutants in storm water discharges are those which minimize exposure (e.g., covering, curbing, or diking) and treatment type BMPs which are used to reduce or remove pollutants in storm water discharges (e.g., oil/water separators, sediment basins, or detention ponds). EPA believes exposure minimization is an effective practice for reducing pollutants in storm water discharges from oil and gas facilities. Exposure minimization practices lessen the potential for storm water to come in contact with pollutants. These methods are often uncomplicated and inexpensive. They can be easy to implement and require little or no maintenance. EPA also believes that in some instances more resource intensive treatment type BMPs are appropriate to reduce pollutants such as suspended solids and oil/grease in storm water discharges associated with oil and gas facilities. Though these BMPs are somewhat more resource intensive, they can be effective in reducing pollutant loads and may be necessary depending on the type of discharge, types and concentrations of contaminants, and volume of flow.

The types of BMPs used may depend upon the methods of waste management utilized at a facility. Waste management and disposal practices at oil and gas facilities may vary significantly. For example, techniques for disposal of produced water and associated wastes include the following: landfarming/spreading (spreading wastes on land surfaces to stimulate biological degradation); backfilling (storing wastes in a pit and then covering with dirt or other materials); evaporation (in more arid parts of the country, liquid wastes are left exposed and eventually evaporate or percolate into the ground); discharging wastes (sometimes treated) to waters of the United States (NPDES permits are required for such discharges); injection (injecting wastes back into the ground for disposal); and offsite disposal (wastes are taken offsite to a commercial facility for disposal).

The pollutants of concern and the BMPs employed at an oil and gas facility depend upon which, if any, of the disposal techniques listed above are utilized. Where wastes are used for onsite road application, for example, all pollutant constituents of that waste need to be considered a potential contributor to contaminated storm water discharges. In addition, the areas at the facility where road application occurs must also be considered when BMPs are being implemented. In contrast, if all waste is taken to an offsite disposal facility, the waste will most likely not affect the storm water discharges and the areas of concern will not be expanded.

Table I–3 lists some BMPs which may be effective in limiting the amount of pollutants in storm water discharges from oil and gas facilities. The BMPs listed are not necessarily required to be implemented. Rather, BMPs should be chosen based on the specific nature of the storm water discharges at each oil and gas facility and implemented as appropriate. Some of these BMPs involve reducing the amount of waste produced and stored onsite which can potentially contaminate storm water. Based on part 1 information, several of the BMPs suggested are already in place at many of the facilities. Part 1 submittals indicate that diking or other types of diversion occur at approximately 57 percent of the sampling facilities. Thirty percent of the sampling facilities noted that they use some form of covering as a BMP, and catch basins are in place at 12 percent of the sampling facilities. In addition, 11 percent of the facilities designated as samplers in part 1 information reported they had a Spill Prevention Control and Countermeasure Plan in place, and 16 percent had a material management plan.

TABLE I–3.—SUGGESTED BMPS FOR OIL AND GAS FACILITIES

Suggested BMPs
Utilize diking and other forms of containment and diversion around storage tanks, drums of oil, acid, production chemicals, and liquids, reserve pits, and impoundments.
Use diking and other forms of containment and diversion around material handling and processing areas.
Use porous pads under drum and tank storage areas.
Use covers and/or lining for waste reserve and sludge pits to avoid overflows and leaks.
Use drip pans, catch basins, or liners during handling of materials such as tank bottoms.
Reinject or treat produced water instead of discharging it.
Limit the amount of land disturbed during construction of access roads and facilities.
Employ spill plans for pipelines, tanks, drums, etc.
Recycle oily wastes, drilling fluids and other materials onsite, or dispose of properly.
Take wastes offsite to be disposed of instead of burying them.
Use oil water separators.

4. Special Conditions

There are no additional requirements beyond those described in Part VI.B. of this fact sheet.

5. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan. Specific requirements for the pollution prevention plan for oil and gas extraction facilities are described below. These requirements must be implemented in addition to the common prevention plan provisions discussed in Section VI.C. of this fact sheet.

(1) Description of Potential Pollutant Sources. Facilities under this section cover a broad range of oil field activities and service industries.

Drilling sites have large disturbed areas which will contribute additional sediments and suspended solids to the storm water runoff. Well drilling

includes the use of many hazardous chemicals and materials. These include drilling muds, well casing cement, fractionating gels, and well treatments. The storage, mixing, and handling of these materials are potential pollutant sources.

Oil field service industries provide a variety of services for exploration and production activities. These service industries often store and mix chemicals for drilling muds, well casing cement, fractionating gels, and well treatments at the facility. The storage and mixing areas are potential pollutant sources. Often, mixing areas and equipment are exposed to storm water. Many oil field service facilities manufacture some oil field equipment components. The exposed raw materials, intermediate products, finished products, and waste products are potential sources of pollutants in storm water.

In its description of potential pollutant sources, a facility must include information about the RQ release which triggered the permit application requirements. Such information must include: the nature of the release (e.g., spill of oil from a drum storage area); the amount of oil or hazardous substance released; amount of substance recovered; date of the release; cause of the release (e.g., poor handling techniques as well as lack of containment in area); area affected by release, including land and waters; procedure to cleanup release; and remaining potential contamination of storm water from release.

(2) Measures and Controls.

(a) RQ Releases—The permittee must describe the measures taken to clean up RQ releases or related spills of materials, as well as measures proposed to avoid future releases of RQs. Such measures may include, among others: improved handling or storage techniques; containment around handling areas of liquid materials; and use of improved spill cleanup materials and techniques.

(b) Vehicle and Equipment Storage Areas—Vehicles and equipment associated with oil field activity are often coated with oil, oil field drilling muds, and the chemicals associated with drilling. These vehicles and equipment are a significant source of pollutants. The permittee must address these areas, and institute practices to minimize pollutant runoff from this area.

(c) Vehicle and Equipment Cleaning and Maintenance Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for vehicle and equipment cleaning. The facility may consider performing all cleaning operations indoors, covering the cleaning operation, and/or collecting the storm water runoff from the cleaning area and providing treatment or recycling. These cleaning and maintenance activities can result in the exposure of cleaning solvents, detergents, oil and grease and other chemicals to storm water runoff. The use of drip pans, maintaining an organized inventory of materials used in the shop, draining all parts of fluids prior to disposal, prohibiting the practice of hosing down the shop floor where the practice would result in the exposure of pollutants to storm water, using dry cleanup methods, and/or collecting the storm water runoff from the maintenance area and providing treatment or recycling may reduce the pollutants discharged in storm water runoff.

(d) Materials Storage Areas—Storage units of all chemicals and materials (e.g., fuels, oils, used filters, spent solvents, paint wastes, radiator fluids, transmission fluids, hydraulic fluids, detergents drilling mud components, acids, organic additives) may result in the contamination of storm water discharges. Labeling of all storage containers helps facility personnel to respond effectively to spills or leaks. Additionally, covered storage of the materials and/or installation of berming and diking at the area can be effective BMPs.

(e) Chemical Mixing Areas—Chemical mixing (e.g., the mixing of drilling muds, fractionating gels, mixing well casing cement, and well treatment acids and solvents) at both well sites and at facilities with service drilling activities have significant potential to contaminate storm water runoff. The facility should consider covering the mixing area, using spill and overflow protection, minimizing runon of storm water to the mixing area, using dry cleanup methods, and/or collecting the storm water runoff and providing treatment or recycling. The facility should consider installation of berming and diking of the area. The waste water pollutants associated with produced waters, drilling muds, drill cuttings and produced sand from any source associated with onshore oil and gas production, field exploration, drilling, well completion, or well treatment are prohibited from being discharged (40 CFR 435.32).

(f) Preventive Maintenance—The preventive maintenance program must include the inspection of all onsite and offsite mixing tanks and equipment, and inspection of all vehicles which carry supplies and chemicals to oil field activities. These mixing tanks and vehicles carry large volumes of fractionating chemicals and gels, cements, drilling muds, and well treatment chemicals and acids that potentially may contaminate waters of the United States if leaks or spills occur.

(g) Inspection Frequency—All equipment and areas addressed in the pollution prevention plan shall be inspected semiannually. Equipment and vehicles which store, mix or transport hazardous materials will be inspected quarterly. Inspections shall also include the inspection of all onsite mixing tanks and equipment, and inspection of all vehicles which carry supplies and chemicals to oil field activities. These mixing tanks and vehicles carry large volumes of fractionating chemicals and gels, cements, drilling muds, and well treatment chemicals and acids that potentially may contaminate waters of the United States if leaks or spills occur.

6. Numeric Effluent Limitation

There are no additional numerical effluent limitations beyond those listed in Part V.B. of today's permit.

7. Monitoring and Reporting Requirements

a. Monitoring Requirements. The regulatory modifications at 40 CFR 122.44 (i)(2) established on April 2, 1992, grant permit writers the flexibility to reduce monitoring requirements in storm water discharge permits. EPA has determined that the potential for storm water discharges to contain pollutants above benchmark levels, because of the industrial activities and materials exposed to precipitation, does not support sampling at oil and gas facilities. Based on a consideration of the BMPs typically used at these facilities, and generally low pollutant values from the application data, EPA believes that the pollution prevention plan with visual examinations of storm water discharges will help to ensure storm water contamination is minimized. Because permittees are not required to conduct sampling, they will be able to focus their resources on developing and implementing the pollution prevention plan.

Quarterly visual examinations of a storm water discharge from each outfall are required at oil and gas facilities. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are

required to be performed on these samples.

The examination must be made at least once in each designated period during daylight hours unless there is insufficient rainfall or snow-melt to produce a runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Examinations shall be conducted in each of the following periods for the purposes of visually inspecting storm water quality associated with storm water runoff and snow melt: January through March; April through June; July through September; October through December. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

As discussed above, EPA does not believe that chemical monitoring is necessary for oil and gas facilities. EPA believes that between quarterly visual examinations and site compliance evaluations potential sources of contaminants can be recognized, addressed, and then controlled with BMPs. In determining the monitoring requirements, EPA considered the nature of the industrial activities and significant materials exposed at these sites, and performed a review of data provided in Part 2 group applications.

J. Storm Water Discharges Associated With Industrial Activity From Mineral Mining and Processing Facilities

1. Industry Profile

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from eleven major categories of facilities, including: "* * * (iii) facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of noncoal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or storm water contaminated by contact with, any overburden, raw material, intermediate products, finished products, by-products or waste products located on the site of such operations."

This section only covers storm water discharges associated with industrial activities from active and inactive mineral mining and processing facilities. Mineral mining and processing facilities eligible to seek coverage under this section include the following types of operations: Dimension Stone (SIC Code 1411); Crushed and Broken Limestone (SIC Code 1422); Crushed and Broken Granite (SIC Code 1423); Crushed and Broken Stone (SIC Code 1429); Construction Sand and Gravel (SIC Code 1442); Industrial Sand and Gravel (SIC Code 1446); Kaolin and Ball Clay (SIC Code 1455); Clay, Ceramic, and Refractory Minerals (SIC Code 1459); Potash, Soda, and Borate Minerals (SIC Code 1474); Phosphate Rock (SIC Code 1475); Chemical and Fertilizer Mineral Mining (SIC Code 1479); and Miscellaneous Nonmetallic Minerals, Except Fuels (SIC Code 1499).

Storm water discharges covered by this section include all discharges where precipitation and storm water runon come into contact with significant materials including, but not limited to, raw materials, waste products, by-products, overburden, stored materials, and fuels. This includes storm water discharges from haul roads, access roads, and rail lines used or traveled by carriers of raw materials, manufactured products, waste materials, or by-products created by the facility.

This permit may authorize storm water discharges associated with industrial activity that are mixed with storm water discharges associated with industrial activity from construction activities, provided that the storm water discharge from the construction activity is in compliance with the terms, including applicable Notice of Intent (NOI) or application requirements, of a different NPDES general permit or individual permit authorizing such discharges.

This section does not cover any discharge subject to effluent limitation guidelines, unless otherwise specified, including storm water that combines with process wastewater. Storm water that does not come into contact with any overburden, raw material, intermediate product, finished product, by-product, or waste product located on the site of the operation are not subject to permitting under this section according to Section 402(l)(2) of the Clean Water Act. Today's permit contains additional coverage provisions applicable only to mineral mining and processing facilities located in Region VI and Region IX (the States of Louisiana, New Mexico, Oklahoma, and Texas and Arizona). Mine dewatering discharges, which are composed entirely of storm water or ground water seepage, and that are not commingled with any process waste water from

construction sand and gravel, industrial sand, and crushed stone mine facilities located in Region VI and Region IX are eligible for coverage under today's permit. Such discharges, however, are subject to the numeric limitations and compliance monitoring provisions listed in the permit.

This section is applicable to all phases of mining operations, whether active or inactive, as long as there is exposure to significant materials. This includes land disturbance activities such as the expansion of current extraction sites, active and inactive mining stages, and reclamation activities.

This section does not apply to storm water discharges from inactive mining operations occurring on Federal lands, unless an operator can be identified. These discharges are more appropriately covered under a permit currently being developed by EPA.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

There are typically three phases to a mining operation: the exploration and construction phase; the active phase; and the reclamation phase. The exploration and construction phase entails exploration and a certain amount of land disturbance to determine the financial viability of a site. Construction includes building of site access roads, and removal of overburden and waste rock to expose minable ore. These land-disturbing activities are significant potential sources of storm water contaminants. The active phase includes each step from extraction through production of a saleable product. The active phase may include periods of inactivity due to the seasonal nature of these mineral mining activities. The final phase of reclamation is intended to return the land to its pre-mining state.

Because of the land-disturbing nature of the mineral mining and processing industry, contaminants of concern generated by industrial activities in this industry include total suspended solids (TSS), total dissolved solids (TDS), turbidity, and pH. Table J–1 lists potential pollutant source activities, and related pollutants associated with mineral mining and processing facilities.

Industrial activities, significant materials, and material management practices associated with mineral mining and processing methods are typically similar, varying only in the type of rock being mined. Examples of mineral commodities obtained from mineral mining and processing facilities include: crushed stone; construction sand and gravel; industrial sand; gypsum; asphaltic minerals; asbestos and wollastonite; lightweight aggregates; mica and sericite; barite; fluorspar; salines from brine lakes; borax minerals; potash; sodium sulfate; trona; rock salt; phosphate rock; frasch sulfur; mineral pigments; lithium; bentonite; magnesite; diatomite; jade; novaculite; fire clay; attapulite and montmorillonite; kyanite; shale and common clay; aplite; tripoli; kaolin; ball clay; feldspar; talc, steatite, soapstone and pyrophylite; garnet; and graphite.

Industrial activities include, "* * * but [are] not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process wastewaters (as defined at 40 CFR Part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished materials; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water" (40 CFR 122.26(b)(14)). The most common industrial activities at mineral mine sites include extraction of the mineral, material sizing by crushers, material sorting, and product washing.

TABLE J–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS

Activity	Pollutant source	Pollutant
Site Preparation	Road Construction	Dust, TSS, TDS, turbidity.
	Removal of Overburden	Dust, TSS, TDS, turbidity.
	Removal of waste rock to expose the mineral body	Dust, TSS, TDS, turbidity.
Mineral Extraction	Blasting activities	Dust, TSS.
Mineral Processing Activities	Rock Sorting	Dust, TSS, TDS, turbidity, fines.
	Rock Crushing	Dust, TSS, TDS, turbidity, fines.
	Rock Washing	TSS, TDS, turbidity, pH.
	Raw Material Storage	Dust, TSS, TDS, turbidity.
	Waste Rock Storage	Dust, TSS, TDS, turbidity, pH.
	Raw Material Loading	Dust, TSS, TDS, turbidity.
	Processing materials unloading	Diesel fuel, gasoline, oil, lime.
	Raw or Waste Material Transportation	Dust, TSS, TDS, turbidity.
Other Activities	Sedimentation pond upsets	TSS, TDS, turbidity, pH.
	Sedimentation pond sludge removal and disposal	Dust, TSS, TDS, turbidity, pH.
	Air emission control cleaning	Dust, TSS, TDS, turbidity.
Equipment/Vehicle Maintenance.	Fueling activities	Diesel fuel, gasoline, oil.
	Parts cleaning	Solvents, oil, heavy metals, acid/alkaline wastes.
	Waste disposal of oily rags, oil and gas filters, batteries, coolants, degreasers.	Oil, heavy metals, solvents, acids.
	Fluid replacement including hydraulic fluid, oil, transmission fluid, radiator fluids, and grease.	Oil, arsenic, lead, cadmium, chromium, benzene, TCA, TCE, PAHs, solvents.
Reclamation Activities	Site preparation for stabilization	Dust, TSS, TDS, turbidity.

TABLE J–1.—ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS—Continued

Activity	Pollutant source	Pollutant
	Fertilizers	Nitrogen, phosphorus.

Sources: Storm water group applications, Part 1 and 2 and EPA. "Development Document on the Mineral Mining and Processing Point Source Category." (EPA 440/1–76/059b). July 1979.

Significant materials include, "* * * but [are] not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; * * * hazardous substances designated under Section 101(14) of CERCLA; any chemical facilities required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharge" (40 CFR 122.26(b)(12)). Significant materials commonly found at mining facilities include: overburden; waste rock; subore piles; tailings; petroleum-based products; solvents and detergents; manufactured products; and other waste materials.

Materials management practices are defined as those practices employed to diminish contact by significant materials with precipitation and storm water runon, or practices utilized to reduce the offsite discharge of contaminants. To this end, sediment ponds, discharge diversion techniques, as well as methods of dispersion, are used to minimize impacts of significant materials on storm water. For mine sites requiring additional sources of water for processing operations, rainfall events as well as storm water runon will be managed for use in dust suppression, processing, and washing activities. Many mine sites are already equipped with sedimentation ponds and other established process wastewater treatment methods in order to meet effluent limitation guidelines. Additional storm water management practices used at mineral mining facilities include: discharge diversions; drainage/storm water conveyances; runoff dispersion; sediment control and collection practices; vegetation/soil stabilization; and capping contaminated sources.

Nonmetallic minerals are recovered using four basic forms of extraction techniques: open pit, open face or quarry mining; dredging; solution mining; and underground mining. Each type of extraction method may be followed by varying methods of beneficiation and processing. Presented below are brief descriptions of the industrial activities, significant materials, and materials management practices associated with these four extraction processes and associated beneficiation activities. Due to similarities in mining operations for many of the minerals within this sector, industrial activities, significant materials, and materials management practices are fairly uniform across this sector. Unique practices are noted.

a. Open Pit, Open Face, or Quarry Mining. Many mineral mining and processing industries access mineral deposits using open pit, open face or quarrying extraction techniques. For facilities producing dimension stone, crushed and broken stone, construction and industrial sand and gravel, clays, as well as other minerals (borate, phosphate, potash), surface mining is generally the most economical form of extraction.

(1) Industrial Activities. Extraction activities include removal of overburden and waste rock to access mineral deposits. These land-disturbing activities generate piles of topsoil and other overburden as well as waste rock, which are typically stored beside, or within, the pit or quarry. In addition, land disturbance, blasting, crushing, and materials handling activities create large amounts of dust that are either dispersed by local wind patterns or collected in air pollution control mechanisms. At closure, overburden and waste rock may or may not be used to reclaim the pit or quarry depending on Federal, State and local requirements. In addition, access roads and rail spurs, and associated loading and unloading areas, are found onsite.

Following extraction, the mined materials may be transferred to a nearby beneficiation/processing facility or may be beneficiated within the pit or quarry. At a beneficiation/processing facility, unfinished materials may be subjected to dry or wet processing methods. Dry forms of processing include crushing, grinding, sawing, and splitting of the mined material. Wet processing may include simple washing, flotation, or heavy media separation.

(2) Significant Materials. Significant materials generated by most extraction activities at open pit, open face, and quarry mines include overburden piles, waste rock piles, ore and subore piles, and materials spilled from loading and unloading activities. Other exposed materials that can be generated at these types of operations (as well as other mineral mines), include: tailings from flotation and other separation stages; soils impacted by fugitive dust emissions; other process wastes such as clays from phosphate mines; settling ponds that receive process wastewaters; dredged sediment disposal areas; as well as raw material and product storage. Dust and particulate matter collected in air pollution control mechanisms may also be disposed of in onsite waste piles.

(3) Materials Management Practices. Materials management practices at open pit or quarry mining facilities are typically designed to control dust emissions and soil erosion from extraction activities, and offsite transport of significant materials. At many facilities structural Best Management Practices (BMPs) may have already been implemented to manage process wastewaters subject to effluent limitation guidelines. Settling ponds and impoundments are commonly used to reduce Total Suspended Solids (TSS), Total Dissolved Solids (TDS), and other contaminants in process generated wastewaters. These controls may also be used to manage storm water runoff and runon with potentially few alterations to onsite drainage systems. Some facilities included in part 1 of the group applications reported the use of storm water diversions to divert storm water away from pits and quarries, raw material piles, overburden, and waste rock piles.

Tailings impoundments are used to manage tailings generated at facilities engaged in flotation or heavy media separation operations. These impoundments are used to manage beneficiation/processing wastewaters generated at the facility and may also be used to manage storm water runoff.

b. Dredging. Dredging is an extraction method used to access nonmetallic mineral deposits located in quarries or pits (where completely or partially below the water table); in rivers; or estuaries; or offshore, in open bays or sounds. For these types of operations, ore is recovered using scooping devices and suction dredges. Minerals commonly excavated by dredging include sand and gravel, and calcium carbonate.

(1) Industrial Activities. The industrial activities at dredging facilities include excavation of ore from underwater deposits (e.g., in stream beds of perennial or ephemeral streams) by dredges. Processing operations may occur on the dredge barges or at adjacent facilities. On-board processing activities may include: screening; crushing of oversized material; washing; sand classification with hydraulic classifying tanks; gravel sizing; heavy media separation; and product loading/unloading.

Dredges that do not perform on-board processing operations load raw material on a tow-barge for transport to a land-based processing facility. Processing at land facilities typically includes washing to remove clay and other impurities; screening; sizing; crushing; classifying; and heavy media separation.

(2) Significant Materials. Significant materials generated at dredging facilities include ore material piles, waste material piles of oversized, or otherwise unusable materials, and float waste from heavy media separation. Clays and undersized fines are dredging waste by-products that may be returned to the water but may also be stored in piles. Sand fines from gravel crushing operations that cannot be sold, are a major source of exposed waste material at land-based processing facilities. In addition, land-based facilities may also manage dredged sediments removed from onsite settling ponds. Haul roads, storage piles, on-land waste piles, processing operations, and loading/unloading operations are other potential sources of storm water pollutants at these facilities.

(3) Materials Management Practices. Hydraulic dredging operations in open pits or quarries, or land-based processing facilities, use settling ponds for the removal of clay particles, fines, and impurities from process wastewaters. These ponds may also be used to manage contaminated storm water runoff. Water from the settling ponds or basins may be returned to the wet pit to maintain water levels in the pit, or may be discharged offsite. Worked out pits may also be used to contain solid wastes such as fines and oversized materials. These pits are another potential source of storm water contamination in the event of heavy precipitation and subsequent overflow.

Dredging operations in open waters typically discharge process wastewater containing fines to the water body without treatment under the operator's Clean Water Act Section 404 permit.

c. Solution Mining. Solution mining extracts minerals from hard rock mineral or natural brine sources by underground injection of a lixiviant into the ore zone. Minerals are recovered from solution, after the solution is brought to the surface, through evaporation or flotation. Since most solution mining extraction activities occur underground using water to extract values, the potential for these mineral deposits to be exposed to storm water is minimal. However, at the surface of solution mining operations, industrial activities and significant materials, such as haul roads, chemical storage areas, and raw material piles, are common to most sites. These industrial activities and significant materials are all susceptible to storm water exposure and require appropriate storm water management controls.

Descriptions of industrial activities performed by each type of solution mining are provided below. Since the mineral deposits are not exposed to storm water for this type of mining, "industrial activities" describes the type of extraction method used to obtain minerals, not activities susceptible to storm water exposure. Significant materials, and materials management practices do refer to those materials exposed to storm water, and to the subsequent management practices used to control storm water.

Some of the minerals extracted using solution mining include: potash; soda; rock salt; borate minerals; chemical and fertilizer minerals such as barite, fluorspar, salines from lake brines; lithium; and mineral pigments. Many of these minerals may also be recovered using surface and/or underground extraction methods.

(1) Solution Mining—Injection.

(a) Industrial Activities—Rock salt and potash minerals may be recovered by injecting water into subsurface deposits and removing minerals in solution. Water is injected through a cased pipe drilled into a deposit. Saturated solution is then pumped to the surface for processing or storage. Processing may include evaporation, and/or flotation to separate the final product.

(b) Significant Materials—Significant materials at an injection solution mining site may include product storage piles, chemical storage areas, and haul roads. Very little extracted solution remains onsite, since it is often re-injected into the formation.

(c) Materials Management Practices—Solution mining facilities typically operate in arid regions, and are able to use solar evaporation ponds to recover minerals from solution. Due to typically low precipitation and high evaporation rates in these areas, storm water materials management practices may not be prevalent.

(2) Solution Mining—Frasch Sulfur.

(a) Industrial Activities—Sulfur is recovered from deposits using the Frasch sulfur process, which injects hot, purified, water into the subsurface to melt the mineral. Molten sulfur is pumped directly to heated tanks at the surface to maintain a saleable product in liquid form.

(b) Significant Materials—Significant materials generated from Frasch sulfur mining include elemental sulfur, scrap sulfur, tank bottoms, water treatment sludge, bleedwater produced from bleed wells used to remove excess injection water, and drilling wastes such as muds, acidizing fluids and well workover fluids. Since molten sulfur product is piped directly from underground to enclosed storage tanks on the surface, it is not exposed to storm water.

(c) Materials Management Practices—Solid wastes such as elemental and scrap sulfur, tank bottoms, and water treatment sludge may be disposed of in onsite piles. Liquid wastes such as bleedwater, drilling muds, acidizing fluids and workover fluids are typically disposed of in reserve pits and/or workover pits. At the completion of drilling, pit contents may be dried prior to being covered by a liner and buried. Accumulated solids from these pits may also be mixed with clay for use as an additive in drilling muds.

Rainfall runoff and boiler blowdown may be discharged offsite without treatment. Other waste generated at these facilities include power plant wastes and wastewaters, wastewater from sealing wells, sanitary wastes, and miscellaneous other wastewaters collected in drips and drains.

(3) Solution Mining—Evaporation.

(a) Industrial Activities—Another form of solution mining uses evaporation and crystallization of saline waters to produce minerals. Potash, soda, borate, and other minerals, are produced from naturally occurring fluids such as sea water, or from evaporite mineral deposits such as western lake brines. Brines are typically pumped from beneath the crystallized surface of a lake and processed by evaporation and crystallization. Recovered salts are washed, dried and packaged for shipment.

(b) Significant Materials/Materials Management Practices—Significant materials associated with these facilities include raw material piles, evaporation ponds, and residual brines consisting of salts and end liquors, including various added process wastewaters. Residual brines generated may be left in solar

evaporation ponds or dissolved and returned to the lake or injection wells.

d. Underground Mining. Underground mining techniques are used to access mineral deposits located too far underground to access economically from the surface. Though typically a more expensive form of extraction, advantages to underground mining operations include year-round operation, less noise (applicable to facilities located near residential areas), and less surface land disturbance. While most nonmetallic minerals are extracted from surface operations, some minerals existing in bedded or other sedimentary deposits may be accessed by underground extraction techniques. Potash, salt, soda, and borate minerals, as well as chemical and fertilizer minerals, are some of the minerals extracted using this mining method.

(1) Industrial Activities/Significant Materials. Industrial activities that may be associated with storm water discharges include: loading/unloading activities; haul roads; products and materials storage; waste piles; and processing activities. Exposed materials associated with surface beneficiation and processing facilities at underground mines are similar to those associated with open pit, open face, and quarrying facilities.

(2) Materials Management Practices. Materials management practices for significant materials at the surface of underground mining facilities are similar to those materials management practices used at open pit, open face, and quarrying operations.

e. Inactive Mine Sites. Inactive mineral mining and processing operations are those where industrial activities are no longer occurring. When active, mineral extraction could have occurred from open pits or open face mines, solution mines, dredging operations, or underground mines. These sites are included in this section because significant materials may remain onsite. These materials, if exposed, are potential sources of storm water pollutants. Until an inactive mineral mining and processing facility has been reclaimed under applicable State or Federal laws, the site is considered associated with an "industrial activity" and is subject to this section. Due to the seasonal nature of this industry, many mine sites can become temporarily inactive for extended periods.

2. Pollutants in Storm Water Discharges Associated With Mineral Mining and Processing Facilities

Impacts caused by storm water discharges from active and inactive mineral mining and processing operations will vary. Several factors influence to what extent significant materials from mineral mining and processing operations may affect water quality. Such factors include: geographic location; hydrogeology; the type of mineral extracted; the mineralogy of the extracted resource and the surrounding rock; how the mineral was extracted (e.g., quarrying/open face, dredging, solution, or underground mining operations); the type of industrial activities occurring onsite (e.g., extraction, crushing, washing, processing, reclamation etc.); the size of the operation; and type, duration, and intensity of precipitation events. Each of these and other factors will interact to influence the quantity and quality of storm water runoff. For example, air emissions (i.e., settled dust) may be a significant source of pollutants at some facilities while materials storage is a primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections,[71] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

The part 2 group application data requirements did not identify individual site characteristics which may be responsible for elevated or insignificant conventional pollutant loadings.

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the mineral mining and processing industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: dimension stone, crushed stone mining and nonmetallic minerals mining (except fuels); sand and gravel mining; clay, ceramic, and refractory materials mining; chemical and fertilizer mineral mining. The tables below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also list those parameters that EPA has determined merit further monitoring. A table has not been included for the following facilities because less than 3 facilities submitted data in these subsectors: clay, ceramic, and refractory materials mining; and chemical and fertilizer mineral mining facilities.

TABLE J-2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY DIMENSION STONE AND CRUSHED PRODUCTS FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	12	8	15	11	6.3	7.0	0.0	0.0	22.3	16.0	4.0	6.0	19.4	16.9	36.1	25.4
COD	12	8	16	10	37.9	46.4	0.0	0.0	140.0	140.0	33.0	44.0	136.1	159.8	243.3	284.8
Nitrate + Nitrite Nitrogen	6	2	10	4	0.59	0.08	0.00	0.00	3.00	0.30	0.10	0.00	2.89	.	7.96	.
Total Kjeldahl Nitrogen	12	8	15	10	1.56	1.91	0.10	0.34	5.71	6.89	0.67	1.15	6.12	6.47	13.70	13.09
Oil & Grease	11	N/A	15	N/A	1.7	N/A	0.0	N/A	10.0	N/A	0.0	N/A	9.8	N/A	27.4	N/A
pH	11	N/A	15	N/A	N/A	N/A	6.2	N/A	8.5	N/A	7.2	N/A	8.4	N/A	8.9	N/A
Total Phosphorus	12	8	15	10	0.70	0.24	0.00	0.00	7.06	0.71	0.20	0.17	3.12	1.18	10.36	2.89
Total Suspended Solids	12	8	15	10	2522	1920	0	0	27100	13300	124	636	27188	10641	217687	38624

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.

[ii] Composite samples.

[71] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at mineral mining and processing facilities is low yet it still may be applicable at some operations.

TABLE J–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY SAND AND GRAVEL PRODUCTS FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	8	5	9	5	6.4	8.7	0.0	0.0	35.0	17.0	3.3	7.4	27.8	23.1	67.0	34.5
COD	7	5	8	5	145.9	102.8	0.0	12.0	404.0	185.0	54.2	116.0	635.5	441.5	1366.7	916.1
Nitrate + Nitrite Nitrogen	7	5	8	5	1.56	3.31	0.00	0.54	9.00	8.80	0.41	1.63	11.56	12.50	44.19	25.92
Total Kjeldahl Nitrogen	7	5	8	5	1.79	1.60	0.48	0.80	4.90	3.10	1.42	0.96	4.42	3.84	7.00	5.90
Oil & Grease	8	N/A	9	N/A	1.3	N/A	0.0	N/A	5.9	N/A	0.0	N/A	5.1	N/A	8.0	N/A
pH	9	N/A	10	N/A	N/A	N/A	6.0	N/A	10.0	N/A	8.2	N/A	10.8	N/A	12.2	N/A
Total Phosphorus	7	5	8	5	1.39	1.07	0.04	0.11	4.69	2.61	0.53	1.10	10.02	5.50	37.75	13.65
Total Suspended Solids	7	5	8	5	503	519	0	13	2400	1400	97	232	3981	4367	19143	15278

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

There are two options for reducing pollutants in storm water discharges: end-of-pipe treatment and implementing Best Management Practices to prevent and/or eliminate pollution. Discharges from mining operations are in some ways dissimilar to other types of industrial facilities. Mining facilities are often in remote locations and may operate only seasonally or intermittently, yet need year-round controls because significant materials remain exposed to precipitation when reclamation is not completed. These characteristics make resource intensive end-of-pipe management controls less desirable.

A comprehensive storm water management program for a given plant may include controls from each of these categories. Development of comprehensive control strategies should be based on a consideration of site and facility plant characteristics.

a. End-of-Pipe Treatment. At many mineral mining and processing operations, it may be appropriate to collect and treat the runoff from targeted areas of the facility. This approach was taken with 12 industrial categories within the mineral mining and processing industry, subject to national effluent limitation guidelines for process water. Table J–4 identifies the effluent limitation guidelines for process water and for the mineral mining and processing sector. There are several areas where process wastewater guidelines influence the permitting strategy for storm water discharges. Whenever storm water and process wastewater combine, the storm water is treated as process wastewater. To meet the numeric effluent limitation for process water, most, if not all, facilities must collect and temporarily store onsite runoff from targeted areas of the plant. The effluent limitation guidelines do not apply to discharges whenever rainfall events, either chronic or catastrophic, cause an overflow of storage devices designed, constructed, and maintained to contain a 10-year, 24-hour storm. Most technology-based treatment standards, used for treating process waters, are based on relatively simple technologies such as settling of solids, neutralization, and drum filtration.

TABLE J–4.—Mineral Mining and Processing: Effluent Limitation Guidelines

SIC Code	Category	Subcategory	Effluent guidelines
1411	Dimension Stone	N/A	Reserved
1422	Crushed and Broken Limestone	N/A	For Facilities that recyle process waste water: pH 6.0–9.0.
1423	Crushed and Broken Granite		Mine dewatering discharges: pH 6.0–9.0.
1429	Crushed and Broken Stone, Not Elsewhere Classified.		In no case shall a pH limitation outside the range of 5.0–9.0 be permitted.
1442	Construction Sand and Gravel	N/A	For facilities that recycle process waste water: pH 6.0–9.0.
			Mine dewatering discharges: pH 6.0–9.0.
			In no case shall a pH limitation outside the range of 5.0–9.0 be permitted.
1446	Industrial Sand	N/A	All operations except HF flotation:
			TSS: Not to exceed 45mg/L maximum for any 1 day; Average over 30 days not to exceed 25 mg/L.
			pH Within range 6.0–9.0.
			For facilities using HF flotation:
			TSS: Not to exceed 0.046 mg/L maximum for any 1 day; Average over 30 days not to exceed 0.023 mg/L.
			Total Fluoride: Maximum for 1 day: 0.006 mg/L; Average over 30 days: 0.003 mg/L.
			pH Within range 6.0–9.0.
			Mine dewatering discharges:
			TSS: Maximum for 1 day: 45 mg/L; Average over 30 days: 25 mg/L.
			pH: Within range 6.0–9.0.
1455	Kaolin and Ball Clay	Ball Clay Kaolin	Reserved.
1459	Clay, Ceramic, and Refractory Minerals, Not Elsewhere Classified.	Bentonite Magnesite	No Discharge.

TABLE J–4.—Mineral Mining and Processing: Effluent Limitation Guidelines—Continued

SIC Code	Category	Subcategory	Effluent guidelines
	.....	Feldspar, Fire Clay, Attapulgite, and Montmovillonite, Kyanite, Shale and Common Clay Aplite.	Reserved.
1474	Potash, Soda, and Borate Minerals	Borax, Potash, Sodium Sulfate	No Discharge.
	.....	Trona, Rock Salt	Reserved.
1475	Phosphate Rock	N/A	Existing Sources.
	.....	.....	TSS: Maximum for any 1 day: 60 mg/L; Average over 30 days: 30 mg/L.
	.....	.....	pH: Within range 6.0–9.0.
	.....	.....	New sources, process generated wastewater and mine dewatering discharges:
	.....	.....	TSS: Maximum for any 1 day: 60 mg/L; Average over 30 days: 30 mg/L.
	.....	.....	pH: Within range 6.0–9.0.
1479	Chemical and Fertilizer Mineral Mining, Not Elsewhere Classified.	Barite, Fluorspar, Salines from Brine Lakes, Frasch Sulfur.	No Discharge.
	.....	Mineral Pigments, Lithium	Reserved.
1499	Miscellaneous Nonmetallic Minerals, Except Fuels.	Graphite	Process waste water and mine drainage subject to ELG:
	.....	.....	TSS: Maximum for any 1 day: 20 mg/L; Average over 30 days: 10 mg/L.
	.....	.....	Total Fe: Maximum for any 1 day: 2 mg/L; Average over 30 days: 1 mg/L.
	.....	.....	pH: Within range 6.0–9.0.
	.....	Gypsum, Asphaltic Minerals, Asbestos and Wollastonite, Diatomite, Jade, Tripoli (Dry Processes Only).	No discharge.
	.....	Garnet, Talc, Steatite, Soapstone, Pyrophyllite, Mica and Sericite.	Reserved.

End-of-pipe treatments are effective means to control process wastewaters because the types of pollutants and the volume of water to be treated are known. However, storm water discharges from mineral mining and processing facilities can be numerous, intermittent, and of various volumes. Channelization of all storm water that comes into contact with significant materials into a single treatment facility, or construction of numerous treatment devices for each discharge is too burdensome for the regulated community. Therefore, EPA believes that the most appropriate means of storm water management at mineral mining and processing facilities are BMPs. BMPs allow the mine site operator to choose a particular BMP that is best for the characteristics of a particular site and to control parameters of concern.

b. Best Management Practices. EPA believes that the most effective storm water management controls for limiting the offsite discharge of storm water pollutants from mineral mining and processing facilities are source reduction BMPs. Source reduction BMPs are methods by which discharges of contaminants are controlled with little or no required maintenance. Examples of these types of controls include source reduction diversion dikes, vegetative covers, and berms. Source reduction practices are typically (but not always) low in cost and relatively easy to implement. In some instances, more resource intensive treatment BMPs, including sedimentation ponds, may be necessary depending upon the type of discharge, types and concentrations of contaminants, and volume of flow.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with mining activity.

The following six categories describe best management practice options for reducing pollutants in storm water discharges from mineral mining and processing operations: discharge diversions; drainage/storm water conveyance systems; runoff dispersion; sediment control and collection; vegetation/soil stabilization; capping of contaminated sources.

Typical land disturbance activities at mineral mining and processing sites include roads, open pits and quarries, topsoil, overburden, waste rock, subore, ore and product piles; materials storage, mill tailings, ponds and piles, as well as vehicle maintenance and storage areas. Because mineral mining and processing is largely a land disturbance activity, BMPs that minimize erosion and sedimentation will be most effective if installed at the inception of operations and maintained throughout active operations and reclamation of the site. From the construction of access and haul roads to closure and reclamation activities, implementation of BMPs is often essential to minimizing long-term environmental impacts to an area.

Part 1 group application data indicate that several types of BMPs have been implemented at sampling facilities. Commonly used BMPs were sediment control and collection and discharge diversion devices. However, the group application process did not require a description of BMP locations and did not require applicants to describe the number of identical BMPs implemented

at each site. As a result, the effectiveness of BMPs for storm water management, at these facilities cannot be evaluated.

In addition, many of the BMPs listed by facilities may have been implemented as process wastewater treatment mechanisms and are not exclusively used for storm water management. For instance, 43 percent of the sampling subgroup reported using ponds for sediment control and collection. Since some facilities classified as SIC Code 14 are subject to process water effluent limitation guidelines, sedimentation ponds may have been implemented to meet the limit.

Because BMPs described in the part 1 data are limited, EPA is providing an overview of supplementary BMPs for use at mineral mining and processing facilities. However, due to the site-specific nature of facilities within this sector, BMPs cited do not preclude the use of other viable BMP options. Table J–5 summarizes BMP options as they apply to land disturbance activities at mineral mining and processing facilities. Sources of BMP information include: "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990; "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, September, 1992 (EPA 832–R–92–006); "Best Management Practices for Mining in Idaho," Idaho Department of Lands, November 1992; and "Erosion & Sediment Control Handbook," Goldman et al., McGraw-Hill Book Company, 1986.

TABLE J–5.—SUMMARY OF MINE AREAS AND APPLICABLE BEST MANAGEMENT PRACTICES

Land-disturbed area	Discharge diversions	Conveyance systems	Runoff dispersion	Sediment control & collection	Vegetation	Containment
Haul Roads and Access Roads.	Dikes, Curbs, Berms.	Channels, Gutters, Culverts, Rolling Dips, Road Sloping, Roadway Water Deflectors.	Check Dams, Rock Outlet Protection, Level Spreaders, Stream Alteration, Drop Structures.	Gabions, Riprap, Native Rock Retaining Walls, Straw Bale Barriers, Sediment Traps/Catch Basins, Vegetated Buffer Strips.	Seeding, Willow Cutting Establishment.	
Pits/Quarries or Underground Mines.	Dikes, Curbs, Berms.	Channels, Gutters	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Sediment Settling Ponds, Straw Bale Barrier, Siltation Berms.	Seeding	Plugging and Grouting
Overburden, Waste Rock and Raw Material Piles.	Dikes, Curbs, Berms.	Channels, Gutters	Serrated Slopes, Benched Slopes, Contouring, Stream Alteration.	Plastic Matting, Plastic Netting, Erosion Control Blankets, Mulch-straw, Compaction, Sediment/Settling Ponds, Silt Fences, Siltation Berms.	Topsoiling, Seedbed Preparation, Seeding.	Capping
Reclamation	Dikes, Curbs, Berms.	Channels, Gutters	Check Dams, Rock Outlet Protection, Level Spreaders, Serrated Slopes, Benched Slopes, Contouring, Drain Fields, Stream Alteration, Drop Structures.	Gabions, Riprap, and Native Rock Retaining Walls, Biotechnical Stabilization, Straw Bale Barriers, Sediment Traps/Catch Basins, Vegetative Buffer Strips, Silt Fences, Siltation Berms, Brush Sediment Barriers.	Topsoiling, Seedbed Preparation, Seeding, Willow Cutting Establishment.	Capping, Plugging and Grouting

Haul Roads and Access Roads—Placement of haul roads or access roads should occur as far as possible from natural drainage areas, lakes, ponds, wetlands or floodplains where soil will naturally be less stable for heavy vehicle traffic. If a haul road must be constructed near water, as little vegetation as possible should be removed from between the road and the waterway, as vegetation is a useful buffer against erosion and is an efficient sediment collection mechanism. The width and grade of haul or access roads should be minimal and should be designed to match natural contours of the area. Construction of haul roads should be supplemented by BMPs that divert runoff from road surfaces, minimize erosion, and direct flow to appropriate channels for discharge to treatment areas.

Pits or Quarries—Excavation of a pit or quarry must be accompanied by BMPs to minimize impacts to area surface waters. As discussed in construction of haul roads, as little vegetation as possible should be removed from these areas during excavation activities to minimize

exposed soils. In addition, stream channels and other sources of water that may discharge into a pit or quarry should be diverted around that area to prevent contamination.

Overburden, Waste Rock, and Raw Material Piles—Overburden, topsoil, and waste rock, as well as raw material and intermediate and final product stockpiles should be located away from surface waters and other sources of water, and from geologically unstable areas. If this is not practicable, surface water should be diverted around the piles. As many piles as possible should be revegetated (even if only on a temporary basis). At closure, remaining units should be reclaimed.

BMPs can be used to control total suspended solids levels in runoff from unvegetated areas. These can include sediment/settling ponds, check dams, silt fences, and straw bale barriers.

Reclamation Activities—When a mineral deposit is depleted and operations cease, a mine site must be reclaimed according to appropriate State or Federal standards. Closure activities typically include restabilization of any disturbed areas such as access or haul roads, pits or quarries, sedimentation ponds or work-out pits, and any remaining waste piles. Overburden and topsoil stockpiles may be used to fill in a pit or quarry (where practical). Recontouring and vegetation should be performed to stabilize soils, and prevent erosion.

Major reclamation activities such as recontouring roads and filling in a pit or quarry can only be performed after operations have ceased. However, reclamation activities such as stabilization of banks and reseeding and revegetation should be implemented in mined out portions, or inactive areas of a site as active mining moves to new areas.

EPA recognizes that quarries are frequently converted into reservoirs or recreational areas, after the mineral deposit is depleted. However, this does not preclude the reclamation of disturbed areas above the quarry rim.

(1) Discharge Diversions. Discharge diversions provide the first line of defense in preventing the contamination of discharges and the subsequent contamination of receiving waters of the United States. Discharge diversions are temporary or permanent structures installed to divert flow, store flow, or limit storm water runon and runoff.

These diversion practices have several objectives. First, diversion structures can be designed to prevent otherwise uncontaminated (or less contaminated) water from crossing disturbed areas or areas containing significant amounts of contaminated materials, where contact may occur between runon and significant materials. These source reduction measures may be particularly effective for mineral mining and processing operations to prevent runon of uncontaminated discharges from contacting exposed materials and/or reduce the flow across disturbed areas, thereby lessening the potential for erosion. Second, diversion structures can be used to collect or divert waters for later treatment if necessary. The usefulness of these control measures are limited by such factors as the size of the area to be controlled and the type and nature of materials exposed and precipitation events.

Diversion dikes, curbs, and berms are temporary or permanent diversion structures that prevent runoff from passing beyond a certain point, and divert runoff away from its intended path. Dikes, curbs or berms may be used to surround and isolate areas of concern at mineral mining and processing sites, diverting flow around piles of overburden, waste rock, and storage areas, to minimize discharge contact with contaminated materials and to limit discharges of contaminated water from confined areas.

(2) Drainage/Storm Water Conveyance Systems. Drainage or storm water conveyance systems can provide either a temporary or a permanent management practice which functions to channel water away from eroded or unstabilized areas, convey runoff without causing erosion, and/or carry discharges to more stabilized areas. The use of drainage systems as a permanent measure may be most appropriate in areas with extreme slopes, areas subject to high velocity runoff, and other areas where the establishment of substantial vegetation is infeasible or impractical. For instance, several BMPs described below may be useful storm water and erosion control methods applicable to road construction and maintenance activities.

Channels or Gutters—Channels or gutters collect storm water runoff and direct its flow. Like diversion systems, channels or gutters may act to divert runoff away from a potential source of contamination, but may also be used to channel runoff to a collection and/or treatment area including settling ponds, basins or work-out pits.

Open Top Box Culverts, and Waterbars—These structures are temporary or permanent structures that divert water from a roadway surface. Open top box culverts may be used on steeply graded, unpaved roads in place of pipe culverts to divert surface runoff and flow from inside ditches onto the downhill slope of a road. These structures are typically made of wood and should periodically be monitored and repaired if necessary.

Waterbars are berms built by a dozer or by hand to a one to two foot height. They serve to extend the entire width of the road, with a downslope angle between 30 and 40 percent. Waterbars are kept open at a discharge end to allow water to flow away from the road and require little maintenance. These berms may be used as temporary or permanent structures.

Rolling Dips and Road Sloping—Rolling dips and road sloping are permanent water diversion techniques installed using natural contours of the land during road construction. These BMPs prevent water accumulation on road surfaces and divert surface runoff toward road ditches which then convey the storm water to ponds or other management areas.

Roadway Surface Water Deflector—A roadway surface water deflector is another technique to prevent accumulation of water on road surfaces. The structure uses a conveyor belt sandwiched between two pieces of treated wood and placed within the road to deflect water. This is a useful technique for steeply graded, unpaved roads.

Culverts—Culverts are permanent surface water diversion mechanisms used to convey water off of, or underneath a road. Made of corrugated metal, they must extend across the entire width of the road and beyond the fill slope. Additional erosion control mechanisms may need to be installed at the discharge end of the culvert.

(3) Runoff Dispersion. Drainage systems are most effective when used in conjunction with runoff dispersion devices designed to slow the flow of water discharged from a site. These devices also aid storm water infiltration into the soil and flow attenuation. Some examples of velocity dissipation devices include check dams, rock outlet protection, level spreaders, and serrated and benched slopes.

Check Dams—Check dams are small temporary dams constructed across swales or drainage ditches to reduce the velocity of runoff flows thereby reducing erosion and failure of the swale or ditch. This slowing reduces erosion and gullying in the channel and allows sediments to settle.

Check dams may be installed in small temporary or permanent channels where vegetation of the channel lining is not feasible and where there is danger of erosion. These may be areas where installation of nonerosive liners are not cost effective.

Check dams diminish the need for more stringent erosion control practices in the drainage ditch since they decrease runoff velocity. When constructing check dams, the use of overburden or waste rock should be avoided where there is the potential for contamination.

Rock Outlet Protection—Rock protection placed at the outlet end of culverts, channels, or ditches reduces the depth, velocity, and destructive energy of water such that the flow will not erode the downstream reach. The use of some materials (e.g., mine waste rock or ore) should be avoided where contamination may occur. As with check dams, rock outlet protection may also be used as a source reduction treatment mechanism by using rocks containing limestone or other alkaline materials to neutralize acidic discharges.

Level Spreaders—Level spreaders are outlets for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. Level spreaders diffuse storm water point sources and release it onto areas stabilized by existing vegetation.

Serrated Slopes and Benched Slopes—These runoff dispersion methods break up flow of runoff from a slope, decreasing its ability to erode. Serrated and benched slopes provide flat areas that allow water to infiltrate, and space for vegetation to grow and reinforce soils. Serrated slopes are equipped with small steps, from one to two feet of horizontal surface exposed on each step. Benched slopes have larger steps with vertical cuts between two and four feet high.

Contouring—Surface contouring is the establishment of a rough soil surface amenable to revegetation through creating horizontal grooves, depressions, or steps that run with the contour of the land. Slopes may also be left in a roughened condition to reduce discharge flow and promote infiltration. Surface roughening aids in the establishment of vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold and grow.

This technique is appropriate for all slopes steeper than 3:1 in order to facilitate stabilization of the slope and promote the growth of a vegetative cover. Once areas have been contoured, they should be seeded as quickly as possible.

Drain Fields—Drain fields are used to prevent the accumulation of water and/or ground water at a site by diverting infiltrating sources through gravity flow or pumping. Typically filled with porous, permeable materials such as graded rock, or perforated pipe, and lined with geotextile fabric, these mechanisms are useful underneath significant materials, reducing the amount of water that ultimately comes into contact with significant materials.

Stream Alteration—Altering or channelizing the path of a stream to bypass all or some disturbed areas on a site, allows additional mining activities and avoids contamination of stream water by disturbed lands. This practice is complicated, however, by the need to restore the channel when mining operations end.

Drop Structures—Drop structures are large angular rocks placed in a V-shaped pattern to slow the velocity of storm water runoff. These structures are typically reinforced by logs or large rocks imbedded in the streambanks.

(4) Sediment Control and Collection. Sediment control and collection limits movement and retains sediments from being transported offsite. Several structural collection devices have been developed to remove sediment from runoff before it leaves the site. Several methods of removing sediment from site runoff involve diversion mechanisms previously discussed, supplemented by a trapping or storage device. Structural practices typically involve filtering diffuse storm water flows through temporary structures such as straw bale dikes, silt fences, brush barriers or vegetated areas.

Structural practices are typically low in cost. However, structural practices require periodic removal of sediment to remain functional. As such, they serve as more active-type practices which may not be appropriate for permanent use at inactive mines. However, these practices may be effectively used as temporary measures during active operation and/or prior to the final implementation of permanent measures.

(a) Temporary Treatments

Plastic Matting, Plastic Netting, and Erosion Control Blankets—These BMPs are used to protect bare soils and control dust and erosion. Mats and blankets help to promote vegetative growth by maintaining moisture and heat within the soil. Plastic matting and netting improve slope stabilization and may be used as a permanent treatment to encourage grass growth. Plastic netting is a more effective material to use while promoting growth of vegetation as it permits sunlight to penetrate through to the soils. Erosion control blankets also stabilize slopes and control erosion. These blankets may be made of jute or plastic netting which are more expensive than straw.

Mulch-straw or Wood Chips—Mulches and wood chips are useful temporary covers for bare or seeded soils with an erosion control effectiveness rating of 75 to 98 percent.[72] Like matting, mulch-straw or wood chips help soils retain moisture and warmth to promote vegetative growth. Used on slopes and/or in combination with nylon netting, these materials may prevent erosion by wind and water. Over time, however, the mulch cover will decrease in effectiveness.

Compaction—Soil compaction using a roller or other heavy equipment increases soil "strength" by increasing its density. More dense soil is less prone to erosion and long-term soil settlement. The surface of compacted soils should be roughed and seeded or vegetated to increase its durability.

(b) Permanent Treatments

Sediment/Settling Ponds—Sediment ponds function as sediment traps by containing runoff for long periods of time, allowing suspended solids to settle. These structures can achieve a high removal rate of sediment for both process wastewater and storm water discharges. Sediment/settling ponds are easily constructed and require minimal maintenance. Their flexibility to treat both process wastewater and storm water makes the use of ponds a desirable treatment for discharges from mineral mining and processing facilities. Of course, site characteristics must be such that some or all discharges can be practically channeled to a centralized area for treatment. Where this is not practical, the cost of constructing multiple sediment ponds may become prohibitive. In addition, periodic dredging may be required in order to maintain the capacity of these ponds.

Discharge ponds may also be designed to act as surge ponds which are designed to contain storm surges and then completely drain in about 24 to 40 hours, and remain dry during times of no rainfall. They can provide pollutant removal efficiencies that are similar to those of detention ponds.[73] Storm surge ponds are typically designed to provide both water quality and water quantity (flood control) benefits.[74]

Gabions, Riprap, and Native Rock Retaining Walls—These BMPs are all forms of slope stabilization. Gabions consist of rocks (riprap) contained by rectangular wire boxes or baskets for use as permanent erosion control structures.

[72] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990.

[73] "Urban Targeting and BMP Selection," EPA, Region V, November 1990.

[74] "Urban Surface Water Management," Walesh, S.G., Wiley, 1989.

Riprap consists of loose rocks placed along embankments to prevent erosion. Native rock retaining walls are another form of slope stabilization, with walls up to five feet in height, constructed from native rock to reinforce a steep slope.

Biotechnical Stabilization—Biotechnical stabilization uses live brush imbedded in the soils of a steep slope to prevent erosion. This method relies on the premise that the imbedded vegetation will eventually root and help stabilize the slope.

Straw Bale Barrier—Straw bales may be used as temporary berms, barriers, or diversions; capturing sediments, filtering runoff. When installed and maintained properly, these barriers remove approximately 67 percent of the sediment load.[75] These barriers are applicable across small swales, in ditches, and at the toe of bare slopes where there is a temporary large volume of sediment laden runoff.

Sediment Traps or Catch Basins—These temporary or permanent structures are useful for catching and storing sediment laden storm water runoff and are particularly useful during construction activities to contain runoff. The effectiveness of these BMPs is better in smaller drainage basin areas. Sediment traps are less than 50 percent effective in removing sediment from storm water runoff.[76]

Vegetated Buffer Strips—The installation of vegetated buffer strips will reduce runoff and prevent erosion at a removal efficiency rate of 75 to 99 percent depending upon the ground cover.[77] In addition, vegetated buffer strips catch and settle sediment contained in the storm water runoff prior to reaching receiving waters.

Silt Fence/Filter Fence—A low fence made of filter fabric, wire and steel posts, should be used on small ephemeral drainage areas where storm water collects or leaves a mine site. Silt fences remove 97 percent of the sediment load and are easier to maintain and remove without creating lasting impacts to the environment.[78] Silt and filter fences need to be inspected periodically and may not be as effective as straw bales, since fabric may become clogged with fine particles preventing water flow.

Silt fences may have limited applicability for large areas. They are most effective for use in a small drainage areas. These fences may also be used in conjunction with nonstructural practices to maintain the integrity of soil prior to the establishment of vegetation.

Siltation Berms—Siltation berms are typically placed on the downslope side of a disturbed area to act as an impermeable barrier for the capture and retention of sediments in surface water runoff. Plastic sheeting is typically used to cover the berm. The berm and the plastic sheeting may require periodic maintenance and repair.

Brush Sediment Barriers—Brush barriers are temporary sediment barriers composed of tree limbs, weeds, vines, root mat, soil, rock and other cleared materials placed at the toe of a slope. A brush barrier is effective only for small drainage areas, usually less than 1/4 acre, where the slope is minimal.

Brush barriers do not function as permanent barriers since over time the barrier itself will degrade. This BMP is most effective when located at the toe of a slope of an area in which vegetation is being grown or during temporary operations. The brush barriers remove any excessive sediment generated by erosion prior to the establishment of vegetation.

(5) Vegetation Practices. Vegetation practices involve establishing a sustainable ground cover by permanent seeding, mulching, sodding, and other such practices. A vegetative cover reduces the potential for erosion of a site by: absorbing the kinetic energy of raindrops which would otherwise impact soil; intercepting water so it can infiltrate into the ground instead of running off and carrying contaminated discharges; and by slowing the velocity of runoff to promote onsite deposition of sediment. Vegetative controls are often the most important measures taken to prevent offsite sediment movement and can provide a six-fold reduction in the discharge of suspended sediment levels.[79] Permanent seeding has been found to be 99 percent effective in controlling erosion for disturbed land areas.[80] Many States require that topsoil be segregated from other overburden for use during reclamation. While stored, topsoil stockpiles should be vegetated. This temporary form of vegetation can often be used for other piles of stored materials and for intermittent/seasonal operations.

Typically, the costs of vegetative controls are low relative to other discharge mitigation practices. Given the limited capacity to accept large volumes of runoff and potential erosion problems associated with large concentrated flows, vegetative controls should typically be used in combination with other management practices. These measures have been documented as particularly appropriate for mining sites.

Topsoiling, Seedbed Preparation—The addition of a layer of topsoil or plant growth material provides an improved soil medium for plant growth. Seedbed preparation may include the addition of topsoil ingredients to be mixed in with soils used for seedbed preparation. Ripping, dicing, and mixing soils promotes weed control and aerates the soil, encouraging seedling growth.

Broadcast Seeding and Drill Seeding—Seeding and vegetative planting are methods used to revegetate an area. Broadcast seeding spreads seeds uniformly, by hand or machine, to steep sloped or rocky areas, flat surfaces, and areas with limited access. Drill seeding is performed using a rangeland drill seeder and may not be used on rocky surfaces. Drill seeding is more suitably performed on flat, nonrocky surfaces, where the machine can insert seeds into the soil.

Willow Cutting Establishment—Willow cutting establishment describes a method of soil stabilization useful for stream banks and other areas located adjacent to water. Similar to biotechnical stabilization, willow cuttings are used to promote growth in an area needing stabilization. Willow cuttings are typically used to reinforce a streambank or other moist area. Willow cuttings require a great deal of moisture and must be planted in areas that remain moist for long periods in order to take hold and grow.

(6) Capping. In some cases, the elimination of a pollution source through capping contaminant sources may be the most cost effective control measure for discharges from inactive mineral mining and processing operations. Depending on the type of management practices chosen, the cost to eliminate the pollutant source may be very high. Once completed, however, maintenance costs will range from low to nonexistent.

Capping or sealing of waste materials is designed to prevent infiltration, as well as to limit contact between discharges and potential sources of

[75] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–14.

[76] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–26.

[77] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–7.

[78] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–15.

[79] "Performance of Current Sediment Control Measures at Maryland Construction Sites," January 1990, Metropolitan Washington Council of Governments, page X.

[80] "Sediment and Erosion Control: An Inventory of Current Practices—Draft," EPA, April 20, 1990, page IV–4.

contamination. Ultimately, capping should reduce or eliminate the contaminants in discharges. In addition, by reducing infiltration, the potential for seepage and leachate generation may also be lessened.

The use of this practice depends on the level of control desired, the materials available, and cost considerations. Many common liners may be effective including common soil, clay, and/or synthetic liners. Generally, soil liners will provide appreciable control for the lowest cost. Synthetic or clay liners may be appropriate to cover materials known to have a significant potential to impact water quality.

4. Storm Water Pollution Prevention Plan Requirements

Specific requirements for a pollution prevention plan for mineral mining and processing facilities are described below. These requirements must be implemented in addition to the common pollution prevention plan provisions discussed previously.

Under the description of potential pollution services, each storm water pollution prevention plan must describe activities, materials, and physical features of the facility that may contribute to storm water runoff or, during periods of dry weather, result in dry weather flows and mine pumpout. This assessment of storm water pollution will support subsequent efforts to identify and set priorities for necessary changes in materials, materials management practices, or site features, as well as aid in the selection of appropriate structural and nonstructural control techniques. Plans must describe the following elements:

The plan must contain a map of the site that shows the pattern of storm water drainage, structural features that control pollutants in storm water runoff[81] and process wastewater discharges, surface water bodies (including wetlands), places where significant materials[82] are exposed to rainfall and runoff, and locations of major spills and leaks that occurred in the 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit. The map also must show areas where the following activities take place: fueling, vehicle and equipment maintenance and/or cleaning, loading and unloading, material storage (including tanks or other vessels used for liquid or waste storage), material processing, and waste disposal, haul roads, access roads, and rail spurs. In addition, the site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

Facility operators are required to carefully conduct an inspection of the site and related records to identify significant materials that are or may be exposed to storm water. The inventory must address materials that within 3 years prior to the date of the submission of a Notice of Intent (NOI) to be covered under this permit have been handled, stored, processed, treated, or disposed of in a manner to allow exposure to storm water. Findings of the inventory must be documented in detail in the pollution prevention plan. At a minimum, the plan must describe the method and location of onsite storage or disposal; practices used to minimize contact of materials with rainfall and runoff; existing structural and nonstructural controls that reduce pollutants in storm water runoff; existing structural controls that limit process wastewater discharges; and any treatment the runoff receives before it is discharged to surface waters or a separate storm sewer system. The description must be updated whenever there is a significant change in the types or amounts of materials, or material management practices, that may affect the exposure of materials to storm water.

The description of potential pollution sources culminates in a narrative assessment of the risk potential that those sources of pollution pose to storm water quality. This assessment should clearly point to activities, materials, and physical features of the facility that have a reasonable potential to contribute significant amounts of pollutants to storm water. Any such activities, materials, or features must be addressed by the measures and controls subsequently described in the plan. In conducting the assessment, the facility operator must consider the following activities: loading and unloading operations; outdoor storage activities; outdoor processing activities; significant dust or particulate generating processes; and onsite waste disposal practices. The assessment must list any significant pollution sources at the site and identify the pollutant parameter or parameters (i.e., total suspended solids, total dissolved solids, etc.) associated with each source.

Under the measures and controls section of the pollution prevention plan, the permittee must evaluate, select, and describe the pollution prevention measures, best management practices (BMPs), and other controls that will be implemented at the facility. The permittee must assess the applicability of the following BMPs for their site: discharge diversions, drainage/storm water conveyance systems, runoff dispersions, sediment control and collection mechanisms, vegetation/soil stabilization, and capping of contaminated sources. In addition, BMPs include processes, procedures, schedules of activities, prohibitions on practices, and other management practices that prevent or reduce the discharge of pollutants in storm water runoff.

The pollution prevention plan must discuss the reasons each selected control or practice is appropriate for the facility and how each will address the potential sources of storm water pollution. The plan also must include a schedule specifying the time or times during which each control or practice will be implemented. In addition, the plan should discuss ways in which the controls and practices relate to one another and, when taken as a whole, produce an integrated and consistent approach for preventing or controlling potential storm water contamination problems.

Under the preventive maintenance requirements of the pollution prevention plan, permittees are required to develop a preventive maintenance program that includes regular inspections and maintenance of storm water BMPs. The maintenance program requires periodic removal of debris from discharge diversions and conveyance systems. These activities should be conducted in the spring, after snowmelt, and during the fall season. Permittees already controlling their storm water runoff frequently use impoundments or sedimentation ponds. Maintenance schedules for these ponds must be provided in the pollution prevention plant.

Under the inspection requirements of the pollution prevention plan, operators

[81] Nonstructural features such as grass swales and vegetative buffer strips also should be shown.

[82] Significant materials include, "* * * but [are] not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; * * * hazardous substances designated under section 101(14) of CERCLA; any chemical facilities required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharge." (40 CFR 122.26(b)(12)) Significant materials commonly found at mining facilities include: overburden; raw materials; waste rock piles; tailings; petroleum based products; solvents and detergents; and manufactured products, waste materials or by-products used or created by the facility.

of active facilities are required to conduct quarterly visual inspections of BMPs. Temporary and permanently inactive operations are required to perform annual inspections. Active sites have more frequent inspections than inactive sites because members of the pollution prevention team will be onsite, and the fact that they are active means there is a greater potential for pollution. The inspections shall include: (1) An assessment of the integrity of storm water discharge diversions, conveyance systems, sediment control and collection systems, and containment structures; (2) visual inspections of vegetative BMPs, serrated slopes, and benched slopes to determine if soil erosion has occurred; and (3) visual inspections of material handling and storage areas and other potential sources of pollution for evidence of actual or potential pollutant discharges of contaminated storm water.

The inspection must be made at least once in each designated period during daylight hours. Inspections for active facilities shall be conducted in each of the following periods: January through March; April through June; July through September; October through December.

EPA believes that this quick and simple description will allow the permittee to assess the effectiveness of his/her plan on a regular basis at very little cost. The frequency of this visual inspection will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow up procedures must be used to ensure that appropriate actions are taken in response to the inspections. The visual inspection is intended to be performed by facility staff. This hands-on inspection will also enhance the staff's understanding of the storm water problems on that site and effects on the management practices that are included in the plan.

Under the recordkeeping and internal reporting procedures of the pollution prevention plan, the permittee must describe procedures for developing and retaining records on the status and effectiveness of plan implementation. The plan must address spills, monitoring, and BMP inspection and maintenance activities. Ineffective BMPs must be reported and the date of their corrective action noted.

Under the sediment and erosion control requirements of the pollution prevention plan, permittees must indicate the location and design for proposed BMPs to be implemented prior to land disturbance activities. For sites already disturbed but without BMPs, the permittee must indicate the location and design of BMPs that will be implemented. The permittee is required to indicate plans for grading, contouring, stabilization, and establishment of vegetative cover for all disturbed areas, including road banks. Reclamation activities must continue until final closure notice has been issued.

According to the pollution prevention runoff requirements, the permittee must evaluate the appropriateness of each storm water BMP that diverts, infiltrates, reuses, or otherwise reduces the discharge of contaminated storm water. In addition, the permittee must describe the storm water pollutant source area or activity (i.e., loading and unloading operations, raw material storage piles etc.) to be controlled by each storm water management practice.

a. Comprehensive Site Compliance Evaluation. The storm water pollution prevention plan must describe the scope and content of comprehensive site evaluations that qualified personnel will conduct to (1) confirm the accuracy of the description of potential pollution sources contained in the plan, (2) determine the effectiveness of the plan, and (3) assess compliance with the terms and conditions of this section. Comprehensive site compliance evaluations should be conducted once a year. When annual comprehensive site compliance evaluations are shown in the plan to be impractical for inactive mining sites, due to remote location and inaccessibility, site evaluations must be conducted at least once every 3 years. The individual or individuals who will conduct the evaluations must be identified in the plan and should be members of the pollution prevention team. Evaluation reports must be retained for at least 3 years after the date of the evaluation.

Based on the results of each evaluation, the description of potential pollution sources, and measures and controls, the plan must be revised as appropriate within 2 weeks after each evaluation. Changes in the measures and controls must be implemented on the site in a timely manner, and never more than 12 weeks after completion of the evaluation.

5. Numeric Effluent Limitation

Except as discussed below, there are no additional numeric effluent limitations under this section beyond those stated in section V.B of today's permit. Part XI.J.4. of today's permit establishes numeric effluent limitations for mine dewatering discharges that are composed entirely of storm water or ground water seepage from construction sand and gravel, industrial sand and crushed stone mines that are located in Region VI (the States of Louisiana, New Mexico, Oklahoma, and Texas). Discharges from these areas may not exceed a maximum TSS concentration of 45 mg/L for any one day or 25 mg/L for the average of daily values for 30 consecutive days. The pH of the discharges from these areas must be within the range of 6.0 to 9.0. These effluent limitations are in accordance with the Crushed Stone, Construction Sand and Gravel, and Industrial Sand Subcategories of the Mineral Mining and Processing Point Source Categories (40 CFR 436.20, 436.30 and 40 CFR 436.40). These limitations represent the degree of effluent reduction attainable by the application of best practicable control technology and best conventional pollutant control technology. Dischargers subject to these numeric effluent limitations must be in compliance with the limits upon commencement of and for the entire term of this permit.

6. Monitoring and Reporting Requirements

a. Monitoring Requirements. Under the revised methodology for determining pollutants of concern in the various industrial categories, dimension and crushed stone and nonmetallic minerals (except fuels) mining and sand and gravel mining facilities are required to monitor for the pollutants listed in the applicable table below (Table J–6 or J–7). The pollutants listed in this table were found to be above benchmark levels. EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

TABLE J–6.—MONITORING REQUIREMENTS FOR DIMENSION AND CRUSHED STONE AND NONMETALLIC MINERALS (EXCEPT FUELS) (MG/L)

Pollutant of concern	Monitoring cut-off concentration
Total suspended solids.	100 mg/L.

TABLE J–7.—MONITORING REQUIREMENTS FOR SAND AND GRAVEL MINING

Pollutants of concern	Monitoring cut-off concentration
Total suspended solids.	100 mg/L.
Nitrate plus Nitrite Nitrogen.	0.68 mg/L.

At a minimum, storm water discharges from dimension and crushed stone, sand and gravel and nonmetallic mineral (except fuels) mining must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in the applicable table (Table J–6 or J–7). If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

If the average concentration for a parameter is less than or equal to the cut-off concentration, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table J–8.

TABLE J–8.—SCHEDULE OF MONITORING

2nd year of permit coverage.	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period.
4th year of permit coverage.	• If average concentration is greater than the value listed in Table J–6 or J–7, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table J–6 or J–7, then no further sampling is required for that parameter. • Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table J–6 or J–7. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will be used to reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports described in paragraph (*2*) below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, and that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports required under paragraph (*2*) below. The permittee is required to complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the date exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

(2) Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum requirements, an additional signed Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled.

(3) Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-

hour interval is representative for local storm events during the season when sampling is being conducted. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable, permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

(4) Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(5) Adverse Conditions. When a discharger is unable to collect samples within a specified sampling period due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate qualifying event in the next period and submit the data along with data for the routine sample in that period. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

B. Quarterly Visual Examination of Storm Water Quality. Mineral mining and processing facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination(s) must be made at least once in each of the following three-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) or when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes,electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

(5) EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

EPA believes that between quarterly visual examinations, site compliance evaluations and the limited analytical monitoring required of the specified subsectors, potential sources of contaminants can be recognized, addressed, and then controlled with BMPs. In determining the monitoring requirements, EPA considered the nature of the industrial activities and significant materials exposed at these sites and performed a review of data provided in Part 2 group applications.

c. Compliance Monitoring Requirements. Today's permit requires permittees with mine dewatering discharges from construction sand and gravel, industrial sand, and crushed stone mine facilities to monitor for the presence of TSS and pH. These monitoring requirements are necessary to evaluate compliance with the numeric effluent limitation established for these discharges. Monitoring shall be performed quarterly upon a minimum of one grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. Monitoring results shall be submitted on signed Discharge Monitoring Report Form(s) postmarked no later than the 31st day of the month following collection of the sample. Facilities which discharge through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit signed copies of discharge monitoring reports to the operator of the municipal separate storm sewer system.

Alternative Certification provisions described in Section XI.J.5 do not apply to facilities subject to compliance monitoring requirements in this section. Compliance monitoring is required at least annually for discharges subject to effluent limitations. Therefore, EPA cannot permit a facility to waive compliance monitoring.

Construction sand and gravel, industrial sand and crushed stone mining facilities are not required to collect and analyze separate samples for the presence of TSS to satisfy the Compliance Monitoring requirements of Section XI.J.5.d. during a year in which the facilities have collected and analyzed samples for TSS in accordance with the Analytical Monitoring requirements of Section XI.J.5.a. The results of all TSS Analytical Monitoring analyses may also be reported as Compliance Monitoring results in accordance with Section XI.J.5.d.(3) where the monitoring methodologies are consistent.

7. Definitions

"Overburden" means any material of any nature, consolidated or unconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally occurring surface materials that are not disturbed by mining operations.

"Overflow" means a precipitation induced overflow of a facility that is designed, constructed, and maintained to contain, or treat, the volume of wastewater which would result from 10-year, 24-hour precipitation events.

Storm Water Discharges Associated With Industrial Activity from Hazardous Waste Treatment, Storage, or Disposal Facilities

Industry Profile

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharge associated with industrial activity." This definition includes point source discharges of storm water from 11 categories of facilities, including "* * * (iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA * * *." Part XI.K. of today's permit only covers storm water discharges from facilities that treat, store, or dispose of hazardous wastes.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Some industrial facilities that generate hazardous waste have onsite capacity to store, treat, and even dispose of their waste. Many hazardous waste generators, however, send their waste offsite to a treatment, storage, or disposal facility (TSDF). Generators of hazardous waste must arrange for a transporter who has obtained an EPA ID number to transport the generator's waste to a designated facility (i.e., a facility that is permitted under RCRA to receive and treat, store, or dispose of hazardous waste).

Once wastes are accepted by the TSDF, any number of activities may follow. For example, some wastes are disposed without any intervening storage or treatment, while other wastes are held in storage prior to treatment or disposal. Hazardous wastes are generally stored in containers and tanks, which are enclosed by a bermed area to prevent any releases to the environment from the storage units.

The processes for treating hazardous wastes can be divided into two major categories based on whether the waste is organic or inorganic in nature. Organic wastes are treated by destructive technologies, like incineration, whereas inorganic wastes are treated using fixation technologies, like stabilization, in which the hazardous constituents are immobilized in the residual matrix. Residuals from fixation processes are usually land-disposed where the stabilized constituents are much less likely to leach into the environment.

As mentioned above, some wastes are treated prior to disposal while others are disposed as-generated. Hazardous waste disposal units include landfills, surface impoundments, waste piles, and land treatment units. Such disposal units may have specific requirements under RCRA Subtitle D. Wastes are also disposed by being burned in incinerators. Some liquid hazardous wastes are underground-injected into deep wells regulated under the Underground Injection Control (UIC) program in 40 CFR Parts 144 to 148. The RCRA regulations governing the different types of hazardous waste treatment, storage, and disposal units are located in 40 CFR Part 264, Subparts I through O and Subpart W.

Hazardous wastes are also recycled at TSDFs. Recycling is considered a form of treatment, however, the recycling process itself is not generally regulated under RCRA. Recycling activities include reclamation, regeneration, reuse, burning for energy or materials recovery, and use in a manner constituting disposal (i.e., land application of hazardous waste or products containing hazardous waste).

2. Pollutants in Storm Water Discharges Associated With Hazardous Waste Treatment, Storage, or Disposal Facilities

Given the diversity and amount of hazardous wastes handled at TSDFs, pollutants in storm water discharges may vary considerably. Contaminated storm water discharges may result from precipitation coming in contact with spills or leaks of hazardous waste. TSDFs regulated under RCRA Subtitle C, however, are required to control much of their storm water runoff through secondary containment (e.g., secondary containment for tank systems; 40 CFR 264.193). When a spill of a listed hazardous waste occurs, for example, the spilled material and any storm water that comes into contact with the material is a hazardous waste under RCRA and must be cleaned up and managed in accordance with all applicable regulations.

In addition to the types of hazardous materials handled and the procedures for controlling runoff at a particular TSDF, several other factors influence to what extent significant materials from these types of facilities and processing operations can affect water quality. Such factors include: hydrology/geology; volume of wastes handled; extent of industrial activities at a TSDF (i.e., only storage, or storage plus treatment and disposal); and type, duration, and intensity of precipitation events. These and other factors will interact to influence the quantity and quality of storm water runoff. In addition, sources of pollutants other than storm water, such as illicit connections,[16] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Pollutants in storm water discharges from TSDFs may consist of, in the case of spills or leaks which are not properly contained or cleaned up, hazardous wastes and/or their constituents. 40 CFR Part 261 Subpart D contains the lists of hazardous wastes, and Appendix VII to Part 261 is a list of the hazardous constituents for which each of these wastes is listed.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at TSDFs facilities as a whole and not subdivide this sector. Therefore, Table K–1 lists data for selected parameters from facilities in the TSDF sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F.

TABLE K–1.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY HAZARDOUS WASTE TREATMENT STORAGE OR DISPOSAL FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant	No. of facilities		No. of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
Sample type	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	3	4	8	9	17.8	9.44	0.0	0.0	45.0	45.0	11.5	7.0	49.7	35.7	82.3	62.9
COD	3	4	8	9	117.6	51.9	12.0	10.0	500.0	131.0	56.5	45.0	419.2	158.9	910.3	285.8
Nitrate + Nitrite Nitrogen	4	4	9	9	0.46	0.39	0.15	0.07	0.79	0.67	0.47	0.34	1.07	1.06	1.59	1.72
Total Kjeldahl Nitrogen	4	4	9	9	1.43	1.07	0.64	0.25	3.00	3.92	1.30	0.92	2.64	2.96	3.52	5.21
Oil & Grease	4	N/A	9	N/A	9.3	N/A	0.0	N/A	74.0	N/A	0.0	N/A	56.3	N/A	251.8	N/A
pH	2	N/A	7	N/A	N/A	N/A	5.6	N/A	7.8	N/A	7.3	N/A	8.7	N/A	9.6	N/A
Total Phosphorus	4	4	9	9	0.24	0.11	0.00	0.00	1.60	0.32	0.07	0.09	0.67	0.28	1.51	0.43
Total Suspended Solids	3	4	8	9	338	82.7	4	5	1100	304	128	32	2463	397	8651	1083

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Pollutant Control Measures Required Through Other EPA Programs

As part of the RCRA program, 40 CFR Part 264 sets standards for treatment, storage and disposal facilities. EPA realizes that some of the conditions of this section are already addressed by the requirements set forth in Part 264. Under the RCRA program, for example, secondary containment is required for tank systems in order to prevent the release of hazardous waste or hazardous constituents to the environment. Such secondary containment must either be capable of preventing storm water runon from entering the system, or have the capacity to contain the volume of the tank plus precipitation from a 25-year, 24-hour rainfall event (40 CFR 264.193).

Conditions such as those set forth for secondary containment at TSDFs are pertinent because they may overlap with aspects of the pollution prevention plan (PPP) required as part of this section. Therefore, in developing a storm water pollution prevention plan, a TSDF should include as Best Management Practices (BMPs) any controls relevant to storm water that have already been implemented under 40 CFR Part 264.

Other areas where RCRA requirements may overlap with the conditions set forth in this section include inspections and employee training. Daily and weekly inspections of tank systems and containers are required, respectively, under Part 264. Therefore, these inspections will be incorporated into the pollution prevention plan for this storm water permit. Similarly, employee training, required under 40 CFR 264.16, does not need to be repeated as part of implementation of the pollution prevention plan, but rather expanded as necessary to include issues concerning storm water management.

4. Options for Controlling Pollutants

In evaluating options for controlling pollutants in storm water discharges, EPA must achieve compliance with the

[16] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at mineral mining and processing facilities is low yet it still may be applicable at some operations.

technology-based standards of the Clean Water Act [Best Available Technology (BAT) and Best Conventional Technology (BCT)]. The Agency does not believe that it is appropriate to establish specific numeric effluent limitations or a specific design or performance standard in this section for storm water discharges associated with industrial activity from hazardous waste treatment, storage, and disposal facilities to meet BAT/BCT standards of the Clean Water Act at this time. Instead, this section establishes requirements for the development and implementation of site-specific storm water pollution prevention plans consisting of a set of Best Management Practices (BMPs) that are sufficiently flexible to address different sources of pollutants at different sites.

Generally, BMPs are implemented to prevent and/or minimize exposure of pollutants from industrial activities to storm water discharges. EPA believes the most effective BMPs for reducing pollutants in storm water discharges are exposure minimization practices. Exposure minimization practices lessen the potential for storm water to come into contact with pollutants. Good housekeeping practices ensure that facilities are sensitive to routine and nonroutine activities which may increase pollutants in storm water discharges. The BMPs which address good housekeeping and exposure minimization are easily implemented, inexpensive, and require little, if any, maintenance. BMP expenses may include construction of roofs for storage areas or other forms of permanent cover and the installation of berms/dikes. Other BMPs such as detention/retention ponds and filtering devices may be needed at these facilities because of the contaminant level in the storm water discharges.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with hazardous waste treatment, storage, or disposal facilities that are not already addressed by RCRA subtitle C.

Facilities covered under this section must already be in compliance with the standards for operating a hazardous waste treatment, storage, or disposal facility as established by 40 CFR Part 264. As discussed in greater detail in the previous section (Pollutant Control Measures Required Through Other EPA Programs), EPA believes that because of the requirements previously imposed on hazardous waste treatment, storage, or disposal facilities, storm water BMPs are already employed at most TSDFs. This belief is supported by part 1 group application data, which indicated that 97 percent of the representative sampling facilities already have SPCC plans in place at their sites.

Because of the potential for spills of hazardous materials during loading and unloading operations, and the absence of an individual discussion of these operations in 40 CFR Part 264, Table K–2 is provided to identify BMPs associated with these activities at hazardous waste treatment, storage, or disposal facilities.

TABLE K–2.—GENERAL LOADING AND UNLOADING STORM WATER BMPS FOR HAZARDOUS WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES

Activity	Best management practices (BMPs)
Outdoor Unloading and Loading	Confine loading/unloading activities to a designated area. Consider performing loading/unloading activities indoors or in a covered area. Consider covering loading/unloading area with permanent cover (e.g., roofs) or temporary cover (e.g., tarps). Close storm drains during loading/unloading activities in surrounding areas. Avoid loading/unloading materials in the rain. Inspect the unloading/loading areas to detect problems before they occur. Inspect all containers prior to loading/unloading of any raw or spent materials. Consider berming, curbing, or diking loading/unloading areas. Use dry clean-up methods instead of washing the areas down. Train employees on proper loading/unloading techniques.

Sources: NPDES Storm Water Group Applications—Part 1. Received by EPA, March 18, 1991 through December 31, 1992 EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.

5. Storm Water Pollution Prevention Plan Requirements.

EPA believes that pollution prevention is the most effective approach for controlling contaminated storm water discharges from hazardous waste treatment, storage, or disposal facilities. The requirements included in the pollution prevention plans provide a flexible framework for the development and implementation of site-specific controls to minimize the pollutants in storm water discharges. This flexibility is necessary because each facility is unique in that the source, type, and volume of contaminated storm water discharge will vary from site to site.

There are two major objectives to a pollution prevention plan: (1) to identify sources of pollution potentially affecting the quality of storm water discharges associated with industrial activity from a facility; and (2) to describe and ensure implementation of practices to minimize and control pollutants in storm water discharges associated with industrial activity from a facility.

The pollution prevention plan requirement reflects EPA's decision to allow hazardous waste treatment, storage, or disposal facilities to utilize BMPs as the BAT/BCT level of control for the storm water discharges covered by this section.

As previously discussed, many of the storm water pollution prevention plan requirements discussed in this section of today's permit and fact sheet are already addressed by the RCRA program and employed at hazardous waste treatment, storage, or disposal facilities. Please note that if RCRA does not address a particular condition which is stipulated in the storm water pollution prevention plan, the facility still must

comply with that requirement of the plan.

6. Numeric Effluent Limitations.

There are no additional requirements under this section other than those stated in Part V.B of the permit.

7. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that treatment, storage, or disposal facilities (TSDFs) may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires TSDFs to collect and analyze samples of their storm water discharges for the pollutants listed in Table K–3. The pollutants listed in Table K–3 were not found to be above benchmark levels in the limited amount of data that was submitted in the group application process, but are believed to be present based upon the description of industrial activities and significant materials exposed. EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

At a minimum, storm water discharges from TSDFs must be monitored quarterly during the second year of permit coverage. Samples shall be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table K–3. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE K–3.—Industry Monitoring Requirements

Pollutants of concern	Cut-off concentration (mg/L)
Ammonia	19
Total Recoverable Magnesium*	0.0636
Chemical Oxygen Demand (COD)	120
Total Recoverable Arsenic.	16854
Total Recoverable Cadmium	0.0159
Total Cyanide**	0.0636
Total Recoverable Lead	0.0816
Total Recoverable Mercury	0.0024
Total Recoverable Selenium	0.2385
Total Recoverable Silver	0.0318

*The MDL for magnesium is 0.02 mg/L method 200.6.

**The MDL for cyanide is 0.02 mg/L method 335.1, .2, or .3.

If the average concentration for a parameter is less than or equal to the value listed in Table K–3, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table K–3, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule for monitoring is presented in Table K–4.

TABLE K–4.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table K–3, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table K–3, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table K–3. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring described in Table K–3, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity,

that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in accordance with Part VI.B. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (C) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or non-process water, then where practicable permittees must attempt to sample the storm water discharges before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of storm water discharges from each outfall are required at TSDFs. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each of the following designated periods: January through March; April through June; July through September; and October through December, during daylight unless there is insufficient rainfall or snow-melt to runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of storm water problems on that site and the effects of the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not collecting samples. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

8. Region-specific Conditions

Region VI intends for this permit to cover all eligible hazardous waste treatment, storage, and disposal facilities, except those that treat and dispose exclusively commercial hazardous waste. Region VI believes that more careful compliance tracking is warranted for facilities that treat and dispose of commercially produced hazardous waste due to the wide range of chemicals and large quantities of hazardous waste materials that are generally disposed as a service to generators. Region VI has determined this to be a priority industry and

required individual permits in the past with limits. This affects permits issued by EPA Region VI for Louisiana (LAR05*###), New Mexico (NMR05*###), Oklahoma (OKR05*###), Texas (TXR05*###), and Federal Indian Reservations in these States (LAR05*##F, NMR05*##F, OKR05*##F, or TXR05*##F).

L. Storm Water Discharges Associated With Industrial Activity From Landfills and Land Application Sites

1. Industry Profile.

This section of today's permit addresses special requirements for storm water discharges associated with industrial activity from landfill and land application sites. Pursuant to 40 CFR 122.26, storm water discharges from landfills, land application sites, and open dumps that receive or have received industrial waste, including sites subject to regulation under Subtitle D of the Resource Conservation and Recovery Act (RCRA), are required to seek permit coverage. Under this section, industrial waste is defined as waste generated by any of the industrial activities described at 40 CFR 122.26(b)(14).

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Special conditions contained in this section apply to land disposal sites that meet the definition of a landfill under RCRA Subtitle D contained at 40 CFR Part 257, which establishes criteria for the classification of solid waste disposal facilities and practices. Part 257 defines landfills as areas of land or excavation in which wastes are placed for permanent disposal, and that are not land application units, surface impoundments, injection wells, or waste piles. Included in this definition are municipal solid waste landfills (MSWLFs) and industrial solid nonhazardous waste landfills. (Many of the 1,410 landfill facilities participating in the group application process are classified as MSWLFs). Therefore, the special conditions in this section apply to both MSWLFs and industrial landfills as defined under Part 257. This section also applies to industrial waste land application sites. Land application sites are defined as facilities at which wastes are applied onto or incorporated into the soil surface for the purpose of beneficial use or waste treatment and disposal. No open dumps were included in the facilities participating in the group application process (open dumps are defined as solid waste disposal units not in compliance with State/Federal criteria established under RCRA Subtitle D) and operation of an open dump is prohibited under RCRA Section 4004. Therefore, storm water discharges from open dumps are not addressed by this section. This section also does not apply to inactive landfills or inactive land application sites located on Federal lands, unless an operator can be identified. These discharges are more appropriately covered under a permit currently being developed by EPA.

The following sections describe industrial and municipal solid waste landfills and industrial waste land application sites.

a. Municipal Solid Waste Landfills. In 1988, EPA estimated that there were approximately 9,300 MSWLFs in the United States. The wastes which are disposed of in MSWLF landfills are highly variable. Examples include household waste (including household hazardous waste which is excluded from RCRA hazardous waste regulation), nonhazardous incinerator ashes, commercial wastes, yard wastes, tires, white goods, construction wastes, municipal and industrial sludges, asbestos, and other industrial wastes. Only a small percentage of all wastes disposed of in MSWLFs are industrial wastes. In 1988, EPA's Report to Congress on solid waste generation indicated that nearly 90 percent of wastes disposed of in all MSWLFs were household or commercial (office) wastes. Industrial process wastes represented only 2.73 percent of the total wastestream (although most MSWLFs currently or have previously accepted industrial wastes and are therefore subject to storm water permitting requirements). The Report also indicated that about half of the total number of MSWLFs received small quantity generator hazardous wastes. In addition, MSWLFs that operated prior to the implementation of RCRA hazardous waste management requirements in 1980 may have received wastes that after that date that would have been classified as hazardous wastes under current RCRA requirements.

A typical MSWLF is a constantly evolving facility which is constructed over its operating life as received wastes are spread, compacted, and covered. Most modern landfills contain one or more separate "units," planned final waste containment areas. Active units continue to receive wastes until they have reached disposal capacity. When capacity is reached, a unit is capped with a final cover, and additional wastes must be placed in other active units. As a result, a landfill may consist of multiple inactive and active units at various stages of completion.

Within each unit, wastes are added in layers referred to as lifts. Received wastes are spread across the working face of the landfill to a depth of six to twenty feet and then compacted. At the end of each working day a thin layer of soil (daily cover) is spread on top of the added wastes and compacted. A large unit may consist of multiple lifts, depending on the planned final depth.

Historically, landfills have been constructed according to one of two generic designs, the trench method and the area method, or a combination of these. The trench method requires the excavation of a trench into which wastes will be placed. Soil from the excavation provides the cover material as disposal continues. In the area method, wastes are placed directly on the ground surface and disposal follows the natural contours of the land. Some landfills use combinations of the two methods at different times depending on the location of the active unit.

MSWLF construction creates constant changes in the contours of the facility resulting in changing patterns of storm water runon and runoff. Controlling erosion of landfill slopes is among the primary concerns of the landfill operator. Current practices generally include a combination of temporary controls (straw bales, silt fences, etc.), in active disposal areas, and permanent controls (recontouring, revegetation, etc.), in areas where waste disposal has been completed.

Daily and intermediate covers serve primarily to protect against disease vectors and to prevent fires and the blowing of refuse. Typically, daily covers consist of the minimum amount of soil excavated from the site needed to cover exposed wastes in the active areas of the landfill. After spreading, the cover is usually compacted to reduce loss from erosion. Intermediate covers, which are also typically soil excavated from the site, are often applied to areas of a unit which will be inactive for

periods of 30 days or more. Deeper than daily covers, intermediate covers may be applied in conjunction with runoff control measures to minimize pooling and high-velocity flow patterns. Both daily and intermediate covers promote infiltration to some extent, depending on depth and soil material.

When a landfill (or landfill unit) has reached disposal capacity, a final cover is applied. Final covers generally provide a relatively impermeable cap over which topsoil is placed and vegetation is established. Permanent runoff controls (diversion channels, recontouring, terracing, etc.) may be constructed to minimize erosion and ponding. Final cover materials in older landfills, which are generally subject to limited regulatory requirements, often consist of a single layer of natural soils. However, at newer landfills subject to more stringent regulatory requirements, other cover materials (polymers, sand and gravel, sewage sludge, etc.) are frequently combined with soil in multiple layers.[84]

b. Industrial Landfills. Industrial landfills only receive wastes from industrial facilities such as factories, processing plants, and manufacturing sites. These facilities may also receive hazardous wastes from very small quantity hazardous waste generators (less than 100 kilograms per month), as defined in RCRA Subtitle C. Included in these waste streams are some PCB-contaminated wastes. The Toxic Substances Control Act PCB disposal regulations allow limited categories of PCB materials to be disposed of in RCRA Subtitle D landfills.[85] In 1988, EPA estimated that there were at least 3,511 industrial Subtitle D landfills (this would presumably be the maximum number of non-MSWLF facilities regulated by the storm water program). The specific number of these units that are onsite and offsite facilities (i.e., centralized waste management units) was not available. Because wastes generated by industrial facilities vary considerably, both between and within industries, the wastes disposed of at industrial landfills can be highly variable. For example, the industrial nonhazardous waste category includes wastes from the pulp and paper industry, the organic chemical industry, the textile manufacturing industry, and a variety of other industries. Consequently, these waste streams may vary in chemical composition and/or physical form. Most industrial landfills are privately owned.[86]

Currently, there are limited data available on industrial landfills. Specific industrial waste streams have not been well characterized and little is known about the hazards they may pose. Limited data are also available regarding the design, operation, and location of these facilities. It has been documented, however, that there has been only sporadic application of design and operating controls at industrial landfills. In 1988, only about 12 percent of industrial landfills (including both onsite and offsite facilities) had any type of liner, and fewer than 35 percent employed runon/runoff controls.[87] The use of these controls (including runon and runoff controls) at industrial waste landfills is likely to increase as State industrial waste programs continue to evolve.

c. Land Application Sites. In 1988, EPA estimated that there were approximately 5,605 land application sites in the United States. These sites receive wastes (primarily wastewaters and sludges) from facilities in virtually every major industrial category. More than half of all land application sites cover less than 50 acres and receive less than 50 tons of waste annually. The largest number of active land application sites in 1988 were observed in the food and kindred products industry, however the pulp and paper industry managed the largest gross quantity of waste using this practice. Similar to landfills, the variability in types of waste that are land applied precludes any general characterization of the materials that may be exposed to storm water. Typically, individual land applications will only dispose of wastes with specific characteristics. However, the criteria for selection are site-specific depending on type of process used and the soil characteristics. Waste application techniques are dependent on waste characteristics.

In 1988, EPA found that 68.5 percent of all industrial waste land application units had runon and runoff controls. No information was available on the extent of closure requirements applicable to land application units.

2. Potential Pollutant Sources and Options for Controlling Pollutants at Landfill and Land Application Sites

a. Landfills. At landfill sites, runoff carrying suspended sediments and commingling of runoff with uncontrolled leachate are the two primary sources of pollutants that this section is intended to address. Other potential sources of pollutants at landfills, those from ancillary areas of the landfill and which are not directly associated with landfill activities (i.e., vehicle maintenance, truck washing, etc.) may be subject to requirements in other sections of today's permit.

Total Suspended Solids. Storm water discharges from landfill sites often contain high TSS levels because of the extensive land disturbance activities associated with landfill operations. Suspended solids can adversely affect fisheries by covering the bottom of a stream or lake with a blanket of material that destroys the fish food bottom fauna or spawning grounds. In addition, while they remain in suspension, suspended solids can increase turbidity, reduce light penetration, and impair the photosynthetic activity of aquatic plants.[88] Specific sources of TSS loadings from landfill operations and typical Best Management Practices (BMPs) used to control TSS levels in storm water runoff are shown in Table L–1. The listed BMPs are consistent with the BMPs identified in part 1 of the permit applications submitted by landfill group applicants.

[84] "Report to Congress: Solid Waste Disposal in the United States," Vol. II, Office of Solid Waste and Emergency Response, Oct. 1988.

[85] Ibid.

[86] Ibid.

[87] Ibid.

[88] EPA. 1974 (October). "Development Document for the Effluent Limitations Guidelines and New Source Performance Standards for the Steam Electric Power Point Source Category."

TABLE L–1.—SOURCES OF TSS LOADINGS AND TYPICAL BMPS USED FOR EROSION CONTROL AT LANDFILLS

Potential pollutant sources	BMPs
Erosion from: Exposed soil from excavating cells/trenches. Exposed stockpiles of cover materials. Inactive cells with final cover but not yet finally stabilized. Daily or intermediate cover placed on cells or trenches. Erosion from haul roads (including vehicle tracking of sediments).	Stabilize soils with temporary seeding, mulching, and geotextiles; leave vegetative filter strips along streams. Implement structural controls such as dikes, swales, silt fences, filter berms, sediment traps and ponds, outlet protection, pipe slope drains, check dams, and terraces to convey runoff, to divert storm water flows away from areas susceptible to erosion, and to prevent sediments from entering water bodies. Frequently inspect all stabilization and structural erosion control measures and perform all necessary maintenance and repairs. Stabilize haul roads and entrances to landfill with gravel or stone. Construct vegetated swales along road. Clean wheels and body of trucks or other equipment as necessary to minimize sediment tracking (but contain any wash waters [process wastewaters]). Frequently inspect all stabilization and structural erosion control measures and perform all necessary maintenance and repairs.

(2) *Other Pollutants.* Table L–2 presents potential sources of other pollutants in storm water discharges from landfill operations. The specific pollutants associated with each of these sources are highly variable, depending upon individual site operations and waste types received. Table L–2 also lists BMPs that would be expected to be used in these areas to minimize potential pollutant loadings. Several of these BMPs were identified in the group permit applications submitted by landfill operators.

TABLE L–2.—SOURCES AND BMP CONTROLS OF POTENTIAL POLLUTANTS (OTHER THAN TSS)

Potential pollutant source	BMPs
Application of fertilizers, pesticides, and herbicides.	Observe all applicable Federal, State, and local regulations when using these products. Strictly follow recommended application rates and methods (i.e., do not apply in excess of vegetative requirements).
Exposure of chemical material storage areas to precipitation (including pesticides, fertilizers, and herbicides).	Have materials such as absorbent pads easily accessible to clean up spills. Provide barriers such as dikes to contain spills. Provide cover for outside storage areas. Have materials such as absorbent pads easily accessible to clean up spills.
Exposure of waste at open face	Minimize the area of exposed open face as much as is practicable. Divert flows around open face using structural measures such as dikes, berms, swales, and pipe slope drains. Frequently inspect erosion and sedimentation controls.
Waste tracking onsite and haul roads, solids transport on wheels and exterior of trucks or other equipment (common with incinerator ash).	Clean wheels and exterior of trucks or other equipment as necessary to minimize waste tracking (but contain any wash waters [process wastewaters]).
Uncontrolled leachate (commingling of leachate with runoff or runon).	Frequently inspect leachate collection system and landfill for leachate leaks. Maintain landfill cover and vegetation. Maintain leachate collection system.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at landfills and land applications sites as a whole and not subdivide this sector. Therefore, Table L–3 lists data for selected parameters from facilities in the landfill and land application sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F, as well as any pollutants that EPA has determined may merit further monitoring.

TABLE L–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY LANDFILLS AND LAND APPLICATION SITES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	30	28	52	50	13.6	8.88	0.0	0.0	140.0	78.0	7.0	4.40	39.8	29.6	76.3	54.5
COD	30	28	52	49	112.9	100.6	0.0	0.0	1220.0	1200.0	31.0	28.0	340.7	278.7	799.1	587.5
Nitrate + Nitrite Nitrogen	29	27	51	48	1.55	1.36	0.00	0.00	22.20	16.6	0.50	0.50	4.07	3.88	8.35	8.14
Total Kjeldahl Nitrogen	30	28	52	49	3.58	3.02	0.20	0.0	37.90	25.9	1.10	1.07	10.90	10.29	25.88	24.6
Oil & Grease	30	N/A	54	N/A	2.9	N/A	0.0	N/A	40.0	N/A	0.0	N/A	12.3	N/A	24.9	N/A
pH	32	N/A	59	N/A	N/A	N/A	3.0	N/A	8.9	N/A	7.3	N/A	9.3	N/A	10.2	N/A
Total Phosphorus	29	27	51	48	0.89	0.93	0.00	0.0	4.28	4.49	0.50	0.36	3.92	4.30	9.30	11.46
Total Suspended Solids	30	27	52	48	2922	1812	0	0	39900	18220	628	336	19476	10933	98449	49016

TABLE L–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY LANDFILLS AND LAND APPLICATION SITES SUBMITTING PART II SAMPLING DATA[i] (mg/L)—Continued

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
Iron, Total	6	6	8	8	65.7	30.2	0.0	0.2	210.0	150.0	17.0	9.4	1736.4	244.8	17684	1105.9

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

b. Land Application Sites. At land application sites, TSS may also be found at elevated levels in storm water discharges (because of the extensive soil disturbance). The occurrence and levels of other pollutants in storm water discharges are dependent on the types of wastes applied and facility design and operation (including use of storm water management/treatment practices. No part 2 data for TSS or any other pollutants were submitted for land application sites nor was such data available from other sources.

There are no Federal criteria for industrial landfill or land application unit design, operation, closure or post-closure care. State programs that address industrial landfills and land application sites vary considerably. As noted above, in 1988, only 35 percent of all industrial landfills had runon/runoff controls. However, many are subject to closure requirements.

3. Pollutant Control Measures Required by Other EPA Programs

EPA recognizes that requirements under other Federal and State programs currently address reclamation/closure of and storm water management at landfill and land application sites. In developing requirements under this section, the Agency has considered how these other program requirements affect the characteristics of storm water discharges (e.g., by limiting contact with potential pollutant sources). Of specific note are recently imposed RCRA criteria at 40 CFR Parts 257 and 258 that address the design, operation, and closure of MSWLFs. These regulations are summarized below.

Regulations at 40 CFR Part 257 classify solid waste disposal facilities and practices. Regulations at 40 CFR Part 258 establish criteria for municipal solid waste landfills. The types of criteria required include: location restrictions, operating criteria, design criteria, ground water monitoring and corrective action, closure and postclosure care, and financial assurance criteria. All States must implement the Federal MSWLF criteria primarily through State solid waste management plans.

As part of the operating criteria, Part 258 requires that all discrete units within MSWLFs receiving waste provide for the following by October 1993 (it should be noted that EPA has proposed an extension of this deadline to April 1994):

(a) Owners or operators of all MSWLF units must design, construct, and maintain:

(1) A runon control system to prevent flow onto the active portion of the landfill during the peak discharge from a 25-year storm:

(2) A runoff control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm event.

In addition, all MSWLF units that received wastes after October 1991 are required to meet specific closure standards (see 40 CFR 258.60). These standards include installation of a final cover consisting of a minimum of 6 inches of topsoil over a minimum of 18 inches of clay. The cover must be no more permeable than the unit's liner. The criteria also imply, but do not explicitly require, that revegetation should be performed.

These criteria indicate that for all but the most severe storm events (i.e., greater than the 24-hour, 25-year storm event), new units within MSWLFs will be required to separate storm water discharges from active and inactive areas. (Active areas are defined as those that have not yet received a final cover [as required under 258.60].) Further, the closure/final cover criteria described above are intended to prevent contact with waste materials and minimize erosion.

4. Storm Water Pollution Prevention Plans Requirements

The requirements for storm water pollution prevention plans under this section build upon the requirements included in the common pollution prevention requirements discussed in the front of this fact sheet. As such, the following discussion focuses on the plan requirements that are specific to landfills and land application sites. The rationale for the common requirements applicable to all types of facilities covered under today's permit (including landfills) is provided in Part VI of this fact sheet.

a. Description of Potential Pollutant Sources. The first step in preventing pollution of storm water from landfills is to identify potential sources of storm water contamination. Consequently, EPA is requiring that landfill and land application site operators include, in their pollution prevention plan, a narrative description of activities at their facilities. The Agency is also requiring landfill permittees to identify on a site map the locations of active and closed cells or trenches, any known leachate springs or other areas where leachate may commingle with runoff, the locations of any leachate collection and handling systems, and the locations of stockpiles of landfill cover material. The Agency is requiring land application site permittees to identify on their site maps the locations of active and inactive land application areas and the types of wastes applied in those areas, any known leachate springs or other areas where leachate may commingle with runoff, the locations of any leachate collection and handling systems, and the locations of temporary waste storage areas. EPA believes these requirements will, in the event contamination is detected in storm water, facilitate the identification of any source of contamination.

EPA is also requiring owners or operators to summarize all available sampling data for storm water and leachate generated at the site because the Agency believes these data will help to determine whether storm water is commingling with any leachate produced at the site. Finally, operators must identify any current NPDES-permitted discharges at their sites.

b. Measures and Controls. EPA is requiring good housekeeping practices for materials storage areas exposed to precipitation and for vehicle tracking of sediment and waste. EPA believes good

housekeeping practices provide a simple and inexpensive means of controlling pollutants from entering storm water and therefore will not be overly burdensome to regulated facilities.

EPA believes that frequent and thorough inspections are necessary to ensure adequate functioning of: sediment and erosion controls, leachate collection systems, intermediate and final covers, and significant materials storage containers. Failure of any of the aforementioned items could cause contamination of storm water with sediment, leachate, or significant materials stored onsite. EPA believes it is necessary to conduct inspections both during storm events and during dry weather. Inspections during dry periods allow facilities to identify and address any problems prior to a storm event, thereby minimizing the chance for storm water contamination. Inspections during significant storm events ensure that measures are functioning as originally intended and provide an opportunity for facilities to observe what materials and/or activities are exposed to storm water. Pollution prevention plans must address the specific inspection requirements for active and inactive landfills and land application sites described in Part XI.L.3.a.(3).(d) of today's permit.

Failures of significant materials storage containers, leachate collection and treatment systems, cover materials, and sedimentation and erosion controls can result in storm water contamination. EPA believes it is necessary to maintain these items in good working order to prevent storm water contamination. Consequently, EPA is requiring (in pollution prevention plans) that owners or operators ensure the maintenance of material storage areas to prevent leaking or rupture and all elements of leachate collection and treatment systems to prevent commingling of leachate with storm water. Pollution prevention plans must also describe measures to be taken to protect the integrity and effectiveness of any intermediate and final covers.

EPA believes controls are needed to reduce potential TSS contamination of storm water and to reduce suspended solids which have been carried by storm water before the discharge leaves the site. Therefore, EPA has chosen to require that pollution prevention plans address both stabilization and structural controls to reduce potential TSS loadings to surface waters.

5. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. This section establishes separate requirements for municipal solid waste landfills (MSWLFs) and industrial landfills. These requirements are discussed below.

(1) MSWLFs. The Agency believes that the MSWLF criteria in 40 CFR 258.60 will effectively separate runoff from active and inactive areas at newer landfills. As a result, separate requirements have been established for active and inactive areas at MSWLF sites.

For discharges from active landfill areas, the Agency believes that there is reasonable potential for runoff to contact waste materials. In these areas, runoff may also become commingled with leachate. In fact, a significant percentage of landfill facilities that submitted group applications, identified leachate and wastes as "exposed materials." In addition, total suspended solids (TSS) levels are also likely to be elevated where contact occurs with wastes, disturbed areas, and daily/intermediate cover materials.

At this time, the Agency does not believe that there are sufficient data available to establish numeric limits based on best available technology for storm water discharges from active MSWLF areas. The data submitted in the part 2 applications, as well as leachate data from available literature, suggest that a variety of constituents may be present at levels that are highly site-specific depending on the types and extent of contact with exposed wastes and extent of commingling with leachate. Furthermore, the volumes of runoff generated will be dependent on the frequency and intensity of precipitation events. For TSS, little or no data are available to characterize the TSS levels in active landfill area runoff and to assess the performance of treatment technologies/best management practices currently in use.

Therefore, in this section, EPA is requiring that landfill operators develop storm water pollution prevention plans. For active landfill areas, these plans should be tailored toward minimizing contact of storm water with waste materials. The plans should also include design and implementation of best management practices and/or treatment methods to control the pollutants likely to be found in runoff at the site. For the active portion of the landfill, this section also requires quarterly monitoring for TSS and total recoverable iron (see below) to quantify the performance of BMPs/treatment measures. These data may be used in the future in the development of individual and/or general permits to establish numeric limitations based on best available technology. It should also be noted that EPA is currently in the process of developing effluent limitation guidelines for discharges of leachate from waste management facilities (including MSWLFs). Where these effluent guidelines apply to discharges from active areas, facilities will be required to comply with these requirements on the effective date.

For units/areas that ceased receiving wastes after October 1991, EPA believes that closure criteria under 40 CFR 258.60 will minimize or eliminate pollutant loadings from waste materials to storm water. For MSWLF units closed in accordance with these criteria, TSS should be the only pollutant of concern. Again, EPA does not believe that adequate data are currently available to establish a numeric limitation based on best available technology (BAT) for TSS in storm water discharges from inactive areas. TSS concentrations in untreated storm water discharges have not been sufficiently well characterized to address the site-specific variability arising from local geology and topography along with individual cover materials and reclamation practices. Furthermore, the available data do not support an assessment of the relative performance of specific BMPs/treatment measures. Quarterly TSS monitoring is required to provide additional data to evaluate the effectiveness of specific control measures.

The Agency is uncertain whether all MSWLF units which ceased receiving wastes prior to October 1991 will have been closed in such a manner to ensure long term stability and minimize the potential for runoff to contact wastes and leachate. Therefore, operators of units that were closed prior to October 1991 are required to conduct the same monitoring as required for active areas. This monitoring is intended to evaluate the integrity and performance of final cover materials in minimizing pollutant loadings to storm water discharges. Based on the results of this monitoring, the permitting authority may elect to continue/modify or terminate the required monitoring, provide for additional permit conditions (including specific BMPs and/or numeric limitations), or terminate coverage under the permit, as appropriate.

An exception from most monitoring requirements is provided for older landfill areas closed prior to October 1991 in accordance with State requirements that meet or exceed the final cover criteria in 40 CFR 258.60. Similar to newer units, TSS should be the only pollutant of concern at these sites and only quarterly TSS monitoring is required.

(2) Industrial Landfills. As discussed above, minimal data are available to characterize storm water discharges or management practices for industrial solid waste landfills. EPA recognizes that onsite landfills are likely to be dedicated waste management units. However, the 1988 Report to Congress indicates that these onsite units can be found at sites in virtually every major industrial category. Offsite landfills can receive industrial wastes from almost any sources. Further, there are no current or planned Federal minimum requirements for runon/runoff control and closure of these onsite and offsite facilities. As a result, existing State programs vary. Some States have extensive permitting and design standard requirements for industrial landfills, often for specific waste types. In contrast, other States have much more limited industrial solid waste programs.

Because of the variability between sites, the need for representative runoff characterization data, and the lack of information on BMP/treatment method performance, this section does not establish effluent limitations for storm water discharges from industrial landfills. At this time, best available technology shall consist of development and implementation of pollution prevention plans. In addition, to ensure protection of water quality, the Agency has established monitoring requirements based on the potential for elevated TSS levels (due to erosion) and the concern that runoff from industrial landfills may contact waste materials and/or leachate.

(3) Land Application Sites. This section includes the same requirements for land application sites as for industrial landfills (as described above). The Agency does not currently have sufficient data to identify specific pollutants common to land application sites and develop numeric limitations. Therefore, the Agency believes that requiring implementation of pollution prevention plans along with TSS and Total Recoverable iron monitoring requirements is appropriate.

In summary, EPA believes that landfill/land application sites may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires landfill/land application sites to collect and analyze samples of their storm water discharges for the pollutants listed in Table L–5.

At a minimum, storm water discharges from landfill/land application sites must be monitored quarterly during the second year of permit coverage. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table L–5. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE L–5.—INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Suspended Solids (TSS)[i]	100 mg/L.
Total Recoverable Iron[ii]	1.0 mg/L.

[i] Applicable to all landfill and land application sites.
[ii] Applicable to all facilities except MSWLF areas closed in accordance with 40 CFR 258.60 requirements.

If the average concentration for a parameter is less than or equal to the value listed in Table L–5, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table L–5, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule of monitoring is presented in Table L–6.

TABLE L–6.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table L–5, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table L–5, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table L–5. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut off concentrations listed in Table L–5 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities which submitted Part 2 data,

reported concentrations greater than or equal to the values listed in Table L–5. Facilities that achieve average discharge concentrations which are less than or equal to the values in Table L–5 are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring reports described in (*c*) below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in accordance with Part VI.C. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (*c*) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. Such permittees must submit monitoring results on signed Discharge Monitoring Report Forms to the Director. For each outfall, one Discharge Monitoring Reporting Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Landfills and land application sites shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted under paragraph (3) below. The examination(s) must be made at least once in each of the following three-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials,

and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the observation data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage are (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

(5) EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and effects on the management practices that are included in the plan.

M. Storm Water Discharges Associated With Industrial Activity From Automobile Salvage Yards

1. Industry Profile

On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of "storm water discharges associated with industrial activity." This definition included point source discharges of storm water from eleven categories of facilities, including "* * * battery reclaimers, salvage yards, and automobile recyclers, including but limited to those classified as Standard Industrial Classification 5015.* * *"

This section establishes special conditions for the storm water discharges associated with industrial activities at automobile salvage yards. Washwaters from vehicle, equipment, and parts cleaning areas are process wastewaters. Discharges of process wastewater and discharges subject to process wastewater effluent limitation guidelines are not eligible for coverage under this section.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

This section has been developed for storm water discharges associated with activities related to dismantling of used motor vehicles for the purpose of selling parts. As stated above, category (vi) of the definition of storm water discharges associated with industrial activity includes facilities primarily engaged in the wholesale or retail distribution of used motor vehicle parts and classified as SIC code 5015. Dismantlers are a major source for replacement parts for motor vehicles in service.

The following description summarizes operations that might occur at a typical automobile dismantling facility. The primary activity involves the dismantling or wrecking of used motor vehicles. Some facilities, however, perform vehicle maintenance and may rebuild vehicles for resale.

Typically, automobile dismantling facilities receive vehicles that are either uneconomical to run or wrecks that are uneconomical to repair. The nature of operations generally depends on the size and location of the facility. In urban areas where land is more valuable, vehicles are typically dismantled upon arrival, parts are segregated, cleaned, and stored. Remaining hulks are generally sold to scrap dealers rather than stored onsite due to limited space. In more rural areas, discarded vehicles are typically stored on the lot and parts removed as necessary. Remaining hulks are sold to scrap dealers less frequently.

Once a used vehicle is brought to the site, fluids may be drained and the tires, gas tank, radiator, engine and seats may be removed. The dismantler may separate and clean parts. Such cleaning may include steam cleaning of the engine and transmission as well as the use of solvents to remove oil and grease and other residues. Usable parts are then inventoried and stored for resale. The remaining car and/or truck bodies are stored onsite for future sale of the sheet metal and glass. Stripped vehicles and parts that have no resale value are typically crushed and sold to a steel scrapper. Some operations may, however, convert used vehicles and parts into steel scrap as a secondary operation. This is accomplished by incineration, shearing (bale shearer), shredding, or baling.

According to the 1987 census, 6,075 establishments reported SIC code 5015 as their primary SIC code, although some estimates indicate that there may be as many as 11,000 to 12,000 of these facilities.[89] Vehicle wreckers and dismantlers are generally small, privately owned businesses. Most facilities employ 10 or fewer employees and derive the majority of their profits from the sale of usable parts. Only a small percentage of this universe consists of large establishments with fleets of trucks, cranes, mobile balers and computers to maintain inventories of parts.[90]

Table M–1 below lists potential pollutant sources from activities that commonly take place at automobile salvage yards.

[89] "The Automobile Scrap Processing Industry," Howard Ness, P.E., 1984.

[90] Ibid.

TABLE M–1.—COMMON POLLUTANT SOURCES

Activity	Pollutant source	Pollutants
Vehicle Dismantling	Oil, anti-freeze, batteries, gasoline, diesel fuel, hydraulic fluids.	Oil and grease, ethylene glycol, heavy metals.
Used Parts Storage	Batteries, chrome bumpers, wheel balance weights, tires, rims, filters, radiators, catalytic converters, engine blocks, hub caps, doors, drivelines, galvanized metals, mufflers.	Sulfuric acid, galvanized metals, heavy metals, petroleum hydrocarbons, suspended solids.
Outdoor Vehicle and Equipment Storage	Leaking engines, chipping/corroding bumpers, chipping paint, galvanized metal.	Oil and grease, arsenic, organics, heavy metals, TSS.
Vehicle and Equipment Maintenance	Parts cleaning	Chlorinated solvents, oil and grease, heavy metals, acid/alkaline wastes.
	Waste disposal of greasy rags, oil filters, air filters, batteries, hydraulic fluids, transmission fluids, radiator fluids, degreasers.	Oil, heavy metals, chlorinated solvents, acid/alkaline wastes oil, heavy metals, chlorinated solvents, acid/alkaline wastes, ethylene glycol.
	Spills of oil, degreasers, hydraulic fluids, transmission fluid, and radiator fluids.	Oil, arsenic, heavy metals, organics, chlorinated solvents, ethylene glycol
	Fluids replacement, including oil, hydraulic fluids, transmission fluid, and radiator fluids.	Oil, arsenic, heavy metals, organics, chlorinated solvents, ethylene glycol.
Vehicle, Equipment, and Parts Washing Areas	Washing and steam cleaning waters	Oil and grease, detergents, heavy metals, chlorinated solvents, phosphorus, salts, suspended solids.
Liquid Storage in Above Ground Storage Tanks	External corrosion and structural failure	Fuel, oil and grease, heavy metals, materials being stored.
	Installation problems	Fuel, oil and grease, heavy metals, materials being stored.
	Spills and overfills due to operator error	Fuel, oil and grease, heavy metals, materials being stored.
Illicit Connection to Storm Sewer	Process wastewater	Dependent on operations.
	Sanitary water	Bacteria, biochemical oxygen demand (BOD), suspended solids.
	Floor drain	Oil and grease, heavy metals, chlorinated solvents, fuel, ethylene glycol.
	Vehicle washwaters	Oil and grease, detergents, metals, chlorinated solvents, phosphorus, suspended solids.
	Radiator flushing wastewater	Ethylene glycol.
	Leaking underground storage tanks	Materials stored or previously stored.

Sources:
NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991 through December 31, 1992.
Alabama Department of Environmental Management. September 30, 1992. "Best Management Plan for Automobile Salvage Yards—Final Report."
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Refinishing Industry." EPA/625/7–91/016.
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EPA, Office of Research and Development. May 1992. "Facilities Pollution Prevention Guide." EPA/600/R–92/088.
EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities—Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.

2. Pollutants in Storm Water Discharges Associated With Automobile Salvage Yards.

Impacts caused by storm water discharges from automobile salvage yards will vary. Several factors influence to what extent operations at the site can affect water quality. Such factors include: geographic location; hydrogeology; the types of industrial activity occurring outside (e.g., dismantling, vehicle and parts storage, or steam cleaning); the size of the operation; and the type, duration, and intensity of precipitation events. Each of these, and other factors, will interact to influence the quantity and quality of storm water runoff. For example, outdoor storage of leaking engine blocks may be a significant source of pollutants at some facilities, while dismantling operations is the primary source at others. In addition, sources of pollutants other than storm water, such as illicit connections,[91] spills, and other improperly dumped materials, may increase the pollutant loading discharged into waters of the United States.

[91] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any number of sources including improper connections, dumping or spills from industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at used motor vehicle parts facilities is low yet it may be applicable at some operations.

EPA has identified the storm water pollutants and sources resulting from various automobile salvage yard activities in Table M–1. Table M–1 identifies oil, heavy metals, acids, and ethylene glycol as some of the parameters of concern at automobile salvage yards.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at automobile salvage yards as a whole and not subdivide this sector. Therefore, Table M–2 lists data for selected parameters from facilities in the automobile salvage yards sector. These data include the eight pollutants that all

facilities were required to monitor under Form 2F, as well as the pollutants that EPA determined merit further monitoring.

TABLE M–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY AUTOMOBILE SALVAGE YARDS SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample type	No. of facilities		No. of samples		Mean		Minimum		Maximum		Median		95th percentile		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	45	59	58	74	15.9	12.37	2.0	0.0	216.0	84.0	7.0	6.0	42.3	38.62	82.5	77.33
COD	65	43	83	54	123.8	73.52	0.0	11.0	1660.0	215.0	62.0	54.5	365.2	177.2	722.3	279.3
Nitrate + Nitrite Nitrogen	45	58	58	73	1.02	2.38	0.00	0.0	6.50	69.3	0.60	0.67	3.23	6.96	6.52	17.0
Total Kjeldahl Nitrogen	37	51	50	68	3.19	2.20	0.04	0.04	18.0	011.0	2.00	1.68	10.22	6.01	19.48	10.2
Oil & Grease	41	N/A	58	N/A	7.0	N/A	0.0	N/A	84.0	N/A	3.0	N/A	26.8	N/A	60.5	N/A
pH	67	N/A	87	N/A	N/A	N/A	3.1	N/A	9.1	N/A	7.3	N/A	9.0	N/A	9.9	N/A
Total Phosphorus	39	54	52	66	0.76	1.22	0.00	0.00	11.20	45.0	0.15	0.11	2.61	2.49	7.70	7.79
Total Suspended Solids	47	60	60	76	552	524.9	0	1.0	4200	8565	196	166.00	2473	2462.6	6951	7999.9
Aluminum, Total	37	34	37	34	13.38	9.14	0.30	0.40	88.00	45.20	8.50	5.95	61.05	36.47	158.90	81.08
Iron, Total	37	34	37	34	19.1	11.2	0.9	0.7	95.0	54.0	10.7	7.5	82.3	43.9	212.2	98.6
Lead, Total	22	22	24	22	0.340	0.200	0.100	0.100	1.400	0.600	0.21	0.10	0.884	0.467	1.512	0.731

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

In evaluating options for controlling pollutants in storm water discharges, EPA must achieve compliance with the technology-based standards of the Clean Water Act [Best Available Technology (BAT) and Best Conventional Technology (BCT)]. The Agency does not believe that it is appropriate to establish specific numeric effluent limitations or a specific design or performance standard in this section for storm water discharges associated with industrial activity from automobile salvage yard operations to meet the BAT/BCT standards of the Clean Water Act. Because of the diversity of operations at automobile salvage yards and the lack of sufficient storm water water quality data currently available to EPA, establishing numeric effluent limitations is not feasible at this time. Rather, this section establishes requirements for the development and implementation of a site-specific storm water pollution prevention plan consisting of a set of Best Management Practices that are sufficiently flexible to address different sources of pollutants at different sites.

Best Management Practices (BMPs) are implemented to prevent and/or eliminate pollutants in storm water discharges. EPA believes the most effective BMPs for reducing pollutants in storm water discharges from automobile salvage yards is through exposure minimization practices. Exposure minimization practices minimize the potential for storm water to come in contact with pollutants. These BMP methods are generally uncomplicated and inexpensive practices. They are easy to implement, and require little or no maintenance. In some instances, more resources-intensive BMPs, including detention ponds or filtering devices, may be necessary depending on the type of discharge, types and concentrations of contaminants, and volume of flow.

The selection of the most effective BMPs will be based on site-specific considerations such as: facility size, climate, geographic location, hydrogeology and the environmental setting of each facility, and volume and type of discharge generated. Each facility will be unique in that the source, type, and volume of contaminated storm water discharges will differ. In addition, the fate and transport of pollutants in these discharges will vary. EPA believes that the management practices discussed herein are well suited mechanisms to prevent or control the contamination of storm water discharges associated with automobile salvage yards.

Part 1 group application data indicate that BMPs have not been widely implemented at the representative sampling facilities. Less than 5 percent of the sampling subgroup list indoor storage as a material management practice. Less than 8 percent of the representative sampling facilities use covering at their storage areas. Less than 3 percent of the representative facilities utilize waste minimization practices. The most commonly listed (approximately 20 percent) material management practice is draining fluids from vehicles prior to storage. Because BMPs described in part 1 data are limited, Table M–3 is provided to identify BMPs associated with activities that may be employed at automobile salvage yards.

TABLE M–3.—STORM WATER BMPS FOR AUTOMOBILE SALVAGE YARDS

Activity	BMPs
Dismantling and vehicle maintenance	Drain all fluids from vehicles upon arrival at the site. Segregate the fluids and properly store or dispose of them. Maintain an organized inventory of materials used in the maintenance shop. Keep waste streams separate (e.g., waste oil and mineral spirits). Nonhazardous substances that are contaminated with a hazardous substance is considered a hazardous substance. Recycle anti-freeze, gasoline, used oil, mineral spirits, and solvents. Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers properly. Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). Drain oil filters before disposal or recycling.

TABLE M–3.—STORM WATER BMPS FOR AUTOMOBILE SALVAGE YARDS—Continued

Activity	BMPs
	Store cracked batteries in a nonleaking secondary container.
	Promptly transfer used fluids to the proper container. Do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers.
	Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.
	Plug floor drains that are connected to the storm or sanitary sewer. If necessary, install a sump that is pumped regularly.
	Inspect the maintenance area regularly for proper implementation of control measures.
	Filtering storm water discharges with devices such as oil-water separators.
	Train employees on proper waste control and disposal procedures.
Outdoor vehicle, equipment, and parts storage .	Use drip pans under all vehicles and equipment waiting for maintenance and during maintenance.
	Store batteries on impervious surfaces. Curb, dike or berm this area.
	Confine storage of parts, equipment and vehicles to designated areas.
	Cover all storage areas with a permanent cover (e.g., roofs) or temporary cover (e.g., canvas tarps).
	Install curbing, berms or dikes around storage areas.
	Inspect the storage yard for filling drip pans and other problems regularly.
	Train employees on procedures for storage and inspection items.
Vehicle, equipment and parts washing areas	Avoid washing parts or equipment outside.
	Use phosphate-free biodegradable detergents.
	Consider using detergent-based or water-based cleaning systems in place of organic solvent degreasers.
	Designate an area for cleaning activities.
	Contain steam cleaning washwaters or discharge under an applicable NPDES permit.
	Ensure that washwaters drain well.
	Inspect cleaning area regularly.
	Install curbing, berms or dikes around cleaning areas.
	Train employees on proper washing procedures.
Liquid storage in above ground containers	Maintain good integrity of all storage containers.
	Install safeguards (such as diking or berming) against accidental releases at the storage area.
	Inspect storage tanks to detect potential leaks and perform preventive maintenance.
	Inspect piping systems (pipes, pumps, flanges, couplings, hoses, and valves) for failures or leaks.
	Train employees on proper filling and transfer procedures.
Improper connection with storm sewers	Plug all floor drains if it is unknown whether the connection is to storm sewer or sanitary sewer systems. Alternatively, install a sump that is pumped regularly.
	Perform dye testing to determine if interconnections exist between sanitary water system and storm sewer system.
	Update facility schematics to accurately reflect all plumbing connections.
	Install a safeguard against vehicle washwaters and parts cleaning waters entering the storm sewer unless permitted.
	Maintain and inspect the integrity of all underground storage tanks; replace when necessary.
	Train employees on proper disposal practices for all materials.

Sources: NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991 through December 31, 1992.
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Refinishing Industry." EPA/625/7–91/0.
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Repair Industry." EPA/625/7–91/013.
EPA, Office of Research and Development. May 1992. "Facility Pollution Prevention Guide." EPA/600/R–92/088.
EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities—Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.
Minnesota Technical Assistance Program. September 1988. "Waste minimization—Auto Salvage Yards."

4. Pollutant Control Measures Required Through Other EPA Programs

Because hazardous substance including oil, gasoline, and lead are commonly found at automobile salvage yards, such facilities may be subject to other State or Federal environmental protection programs. In particular, as described below, the Resource Conservation and Recovery Act (RCRA) and the Underground Storage Tank (UST) programs require careful management of materials used onsite which decreases the probability that storm water from such areas will be contaminated by these materials.

Under the RCRA program, on September 10, 1992, EPA promulgated standards in 40 CFR Part 279 for the management of used oils that are recycled (57 FR 41566). These standards include requirements for used oil generators, transporters, processors/re-refiners, and burners. The standards for used oil generators apply to all generators, regardless of the amount of used oil they generate. Do-it-yourself (DIY) generators which generate used oil from the maintenance of their personal vehicles, however, are not subject to the management standards in 40 CFR 279.20(a)(1)).

The requirements for used oil generators were designed to impose a minimal burden on generators while protecting human health and the environment from the risks associated with managing used oil. Under Subpart C of 40 CFR Part 279, used oil generators must not store used oil in units other than tanks, containers, or units subject to regulation under 40 CFR Parts 264/265 (Section 279.22(a)). In other words, generators may store used oil in tanks or containers that are not subject to Subpart J (hazardous waste

tanks) or Subpart I (containers) of 40 CFR Parts 264/265, as long as such tanks or containers are maintained in compliance with the used oil management standards. This does not preclude generators from storing used oil in Subpart J tanks or Subpart I containers or other units, such as surface impoundments (Subpart K), that are subject to regulation under 40 CFR Part 264 or 265.

Storage units at generator facilities must be maintained in good condition and labeled with the words "used oil." Upon detection of a release of used oil to the environment, a generator must take steps to stop the release, contain the released used oil, and properly manage the released used oil and other materials [40 CFR 279.22 (b) to (d)]. Generators storing used oil in underground storage tanks are subject to the UST regulations in 40 CFR Part 280.

If used oil generators ship used oil offsite for recycling, they must use a transporter who has notified EPA and obtained an EPA identification number [40 CFR 279.24].

The technical standards for USTs at 40 CFR Part 280 require that new UST systems (defined as systems for which installation commenced after December 12, 1988) use overfill prevention equipment that will: 1) automatically shut off flow into the tank when the tank is no more than 95 percent full; or 2) alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high level alarm. The preceding requirements do not apply to systems that are filled by transfers of no more than 25 gallons at one time. Existing UST systems (defined as systems for which installation has commenced on or before December 12, 1988) are required to have installed the described overfill prevention equipment by December 12, 1998.

5. Storm Water Pollution Prevention Plan Requirements

EPA believes that pollution prevention is the most effective approach for controlling contaminated storm water discharges from automobile salvage yards. Pollution prevention plans allow the operator of a facility to select BMPs based on site-specific considerations such as: facility size; climate; geographic location; geology/hydrology; the environmental setting of each facility; and volume and type of discharge generated. This flexibility is necessary because each facility will be unique in that the source, type, and volume of contaminated surface water discharges will differ from site to site.

Under today's general permit, all facilities must prepare and implement a storm water pollution prevention plan. The establishment of a pollution prevention plan requirement reflects EPA's decision to allow operators of automobile salvage yards to utilize BMPs as the BAT/BCT level of control for the storm water discharges covered by this section. The requirements included in pollution prevention plans provide a flexible framework for the development and implementation of site specific controls to minimize pollutants in storm water discharges. This approach and associated deadlines are consistent with EPA's storm water general permits finalized on September 9, 1992 and September 25, 1992 for discharges in nonauthorized NPDES States (57 FR 41236).

There are two major objectives to a pollution prevention plan: 1) to identify sources of pollution potentially affecting the quality of storm water discharges associated with industrial activity from a facility; and 2) to describe and ensure implementation of practices to minimize and control pollutants in storm water discharges associated with industrial activity from a facility.

Specific requirements for a pollution prevention plan for automobile salvage yards are described below. These requirements must be implemented in addition to the baseline pollution prevention plan provisions discussed previously.

a. Contents of the Plan. Storm water pollution prevention plans are intended to aid operators of automobile salvage yards to evaluate all potential pollution sources at a site, and assist in the selection and implementation of appropriate measures designed to prevent, or control, the discharge of pollutants in storm water runoff. EPA has developed guidance entitled "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices," EPA, 1992, (EPA 832–R–92–006) to assist permittees in developing and implementing pollution prevention measures.

(1) Description of Potential Pollution Sources. There are no requirements beyond those described in Part VI.C.2 of this fact sheet.

(2) Measures and Controls. Following completion of the source identification and assessment phase, the permittee must evaluate, select, and describe the pollution prevention measures, best management practices (BMPs), and other controls that will be implemented at the facility. For the following areas at the site, the permittee must assess the applicability of the corresponding BMPs:

Vehicle Dismantling and Maintenance Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for vehicle dismantling and maintenance. The facility must consider draining and segregating all fluids from vehicles upon arrival at the site, or as soon as feasible thereafter. The facility must consider performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts fluids prior to disposal, prohibiting the practice of hosing down the shop floor, using dry cleanup methods, and/or collecting the storm water runoff from the maintenance area and providing treatment. Where dismantling and maintenance activities can not take place indoors, facilities may consider methods for containing oil or other fluid spillage during parts removal. Drip pans, large plastic sheets, or canvas may be considered for placement under vehicles or equipment during maintenance and dismantling activities. Where drip pans are used, they should not be left unattended to prevent accidental spills.

Vehicle, Parts, and Equipment Storage Areas—The storage of vehicles, parts, and equipment must be confined to designated areas (delineated on the site map). The plan must describe measures that prevent or minimize contamination of the storm water runoff from these areas. The facility must consider the use of drip pans, large sheets of plastic, canvas (or equivalent measures) under vehicles, parts, and equipment. Canvas or sheets of plastic may be used as temporary coverage of storage areas. Indoor storage of vehicles, parts and equipment, as well as the installation of roofs, curbing, berming and diking of these areas must be considered. Large plastic or metal bins with secure lids should be used to store oily parts (e.g., small engine parts). Used batteries should be stored within nonleaking secondary containment or by other equivalent means to prevent leaks of acid into storm water discharges.

Material Storage Areas—As part of a good housekeeping program, consider labeling storage units of all materials (e.g., used oil, used oil filters, spent solvents, paint wastes, radiator fluids, transmission fluids, hydraulic fluids). Maintain such containers and units in good condition, so as to prevent contamination of storm water. The plan must describe measures that prevent or minimize contamination of the storm

water runoff from such storage areas. The facility may consider indoor storage of the materials and/or installation of berming and diking of the area.

Vehicle, Equipment, and Parts Cleaning Areas—The plan must describe measures that prevent or minimize contamination of storm water from all areas used for vehicle, equipment, and parts cleaning. The facility must consider performing all cleaning operations indoors. In addition, the facility must consider covering or berming the cleaning operation area. Washwaters from vehicle, equipment, and parts cleaning areas are process wastewaters that are not authorized discharges under this section.

These four areas are sources of pollutants in storm water from automobile salvage yards. EPA believes that the incorporation of BMPs such as those suggested, in conjunction with a pollution prevention plan, will substantially reduce the potential of storm water contamination from these areas. In addition, EPA believes that these requirements continue to provide the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with different facilities.

(a) Preventive Maintenance—Permittees are required to develop a preventive maintenance program that includes regular inspections and maintenance of storm water BMPs. The purpose of the inspections, which may coincide with the inspections required in (b) below, is to check on the effectiveness of the storm water pollution prevention plan. The inspections allow facility personnel to monitor the success or failure of elements of the plan on a regular basis. The use of an inspection checklist should be considered. The checklist will ensure that all required areas are inspected, as well as help to meet the recordkeeping requirements. In addition to regular inspections, employees identifying potential problems during their daily activities, such as leaks or spills, shall take appropriate measures to address these problems as soon as feasible.

(b) Inspections—This section requires that in addition to the comprehensive site evaluation required under Part XI.M.3.a. of today's permit, qualified facility personnel shall be identified to inspect: upon arrival, or as soon as feasible thereafter, all vehicles for leaks; any equipment containing oily parts, hydraulic fluids, or any other fluids, at least quarterly for leaks; and any outdoor storage containers for liquids, including, but not limited to, brake fluid, transmission fluid, radiator water, and anti-freeze, at least quarterly for leaks.

In addition, qualified facility personnel are required to conduct, at a minimum, quarterly visual inspections of BMPs. The inspections shall include: (1) an assessment of the integrity of any flow diversion or source minimization systems; and (2) visual inspections of dismantling areas; outdoor vehicle, equipment, and parts storage area; vehicle and equipment maintenance areas; vehicle, equipment, and parts washing areas; and liquid storage in above ground containers. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections.

The quarterly inspections must be made at least once in each of the following designated periods during daylight hours: January through March (storm water runoff or snow melt); April through June (storm water runoff); July through September (storm water runoff); October through December (storm water runoff). Records of inspections shall be maintained as part of the plan.

(c) Employee Training—Permittees are required to include a schedule for conducting training in the plan. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to the storm water pollution prevention plan. Employee training must, at a minimum, address the following areas when applicable to a facility: used oil management; spill prevention and response; good housekeeping practices; used battery management; and proper handling (i.e., collection, storage, and disposal) of all fluids. This training should serve as: (1) training for new employees; (2) a refresher course for existing employees; and (3) training for all employees on any storm water pollution prevention techniques recently incorporated into the plan, where appropriate, contractor personnel also must be trained in relevant aspects of storm water pollution prevention.

(d) Recordkeeping and Internal Reporting—Permittees must describe procedures for developing and retaining records on the status and effectiveness of plan implementation. The plan must address spills, monitoring, and BMP inspection and maintenance activities. Ineffective BMPs must be reported and the date of their corrective action noted.

(e) Storm Water Management—The permittee must evaluate the appropriateness of each storm water BMP that diverts, infiltrates, reuses, or otherwise reduces the discharge of contaminated storm water. In addition, the permittee must describe the storm water pollutant source area or activity (i.e., loading and unloading operations, raw material storage piles etc.) to be controlled by each storm water management practice.

(3) Comprehensive Site Compliance Evaluation. The storm water pollution prevention plan must describe the scope and content of comprehensive site evaluations that qualified personnel will conduct to: (1) confirm the accuracy of the description of potential pollution sources contained in the plan; (2) determine the effectiveness of the plan; and (3) assess compliance with the terms and conditions of this section. Comprehensive site compliance evaluations should be conducted at least once a year for automobile salvage yards. These evaluations are intended to be more in depth than the quarterly visual inspections. The individual or individuals who will conduct the evaluations must be identified in the plan and should be members of the pollution prevention team. Evaluation reports must be retained for at least 3 years after the date of the evaluation.

Based on the results of each evaluation, the description of potential pollution sources, and measures and controls, the plan must be revised as appropriate within 2 weeks after each evaluation. Changes in the measures and controls must be implemented on the site in a timely manner, and never more than 12 weeks after completion of the evaluation.

6. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that automobile salvage yards may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires automobile yards to collect and analyze samples of their storm water discharges for the pollutants listed in Table M–4. The pollutants listed in Table M–4 were found to be above benchmark levels for a significant portion of sampling facilities that submitted quantitative data in the group application process. EPA is requiring monitoring for these pollutants after the pollution prevention

plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

At a minimum, storm water discharges from automobile salvage yards must be monitored quarterly during the second year of permit coverage, unless the facility exercises the Alternative Certification in Section VI.E.3 of this fact sheet. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table M–4. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE M–4.—INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Suspended Solids	100 mg/L.
Total Recoverable Aluminum	0.75 mg/L.
Total Recoverable Iron	1.0 mg/L.
Total Recoverable Lead	0.0816 mg/L.

If the average concentration for a parameter is less than or equal to the value listed in Table M–4, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table M–4, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule of monitoring is presented in Table M–5.

TABLE M–5.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table M–4, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table M–4, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table M–4. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative certification described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall or on a pollutant-by-pollutant basis, in lieu of sampling described under Part VIII.M.6.a of this factsheet, under penalty of law, signed in accordance with Part VII.G (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in lieu of monitoring reports. The permittee is required to complete any and all sampling until the exposure is eliminated. If the facility is reporting for a partial year, the permittee must specify the date exposure was eliminated. If the permittee is certifying that a pollutant was present for part of the reporting period, nothing relieves the permittee from the responsibility to sample that parameter up until the exposure was eliminated and it was determined that no significant materials remained. This certification is not to be confused with the low concentration sampling waiver. The test for the application of this certification is whether the pollutant is exposed, or can reasonably be expected to be present in the storm water discharge. If the facility does not and has not used a parameter, or if exposure is eliminated and no significant materials remain, then the facility can exercise this certification. The Agency does not expect that

facilities will be able to use the alternative certification for indicator parameters such as TSS and BOD. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. All automobile salvage yard facilities are required to conduct quarterly visual examinations of storm water discharges from each outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples. The examinations must be of a grab sample collected from each storm water outfall.

The examination must be made at least once in each of the following three-month periods: January through March, April through June, July through September, and October through December. The examinations shall be made during daylight unless there is insufficient rainfall or snow-melt to runoff. Whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

N. Storm Water Discharges Associated With Industrial Activity From Scrap Recycling and Waste Recycling Facilities

1. Industry Profile

Specific requirements have been established for those facilities that are engaged in the processing, reclaiming and wholesale distribution of scrap and recyclable waste materials. As background, the storm water regulations define 11 categories of storm water discharges associated with industrial activity in 40 CFR 122.26(b)(14). Category (vi) includes facilities that are engaged in the recycling of materials, including metal scrapyards, battery reclaimers, and salvage yards, including but limited to those classified Standard Industrial Classification (SIC) 5093. For purposes of this section, special conditions have been included for those facilities engaged in the reclaiming and retail/wholesale distribution of used

motor vehicle parts identified as SIC 5015 in Part XI.M.

SIC 5093 includes establishments engaged in assembling, breaking up, sorting and the wholesale distribution of scrap and recyclable waste materials including bag, bottle and box wastes, fur cuttings, iron and steel scrap, metal and nonferrous metal scrap, oil, plastics, rags, rubber, textiles, waste paper, aluminum and tin cans, and rag wastes. For purposes of this permit, the term waste recycling facility applies to those facilities that receive a mixed wastestream of non-recyclable and recyclable wastes. The term recycling facility applies to those facilities that receive only source-separated recyclable materials primarily from non-industrial and residential sources. For purposes of this permit the term recycling facility also applies to those facilities commonly identified as material recovery facilities (MRF).

Part XI.N of the permit is segregated into three separate classes of recycling facilities: (1) scrap recycling and waste recycling facilities (non-liquid recyclable wastes); (2) liquid recyclable waste facilities; and (3) recycling facilities. Each of these three classes of recycling facilities have separate pollution prevention plan and monitoring requirements. EPA further clarifies that battery reclaimers engaged in the breaking up of used lead-acid batteries are not eligible for coverage under this permit. Facilities that participated in U.S. Environmental Protection Agency (EPA) Group Permit Applications 195, 274, 467, 596, 647 (except facilities identified as SIC 4212), 826, 1035, 1145 and 1204 are eligible for coverage under this section.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Pollutants Found in Storm Water Discharges

This fact sheet is organized into three major subsections: scrap and waste recycling facilities (nonliquid wastes); industrial activities engaged in reclaiming and recycling liquid wastes, e.g., used oils, solvents, mineral spirits and antifreeze; and recycling facilities (including material recovery facilities) that receive only source-separated recyclable materials primarily from non-industrial and residential sources including waste paper, newspaper, glass bottles, plastic containers, aluminum and tin cans, and cardboard. Industrial operations and BMPs associated with these three groups are dissimilar enough to warrant establishing separate permit conditions for each group. Therefore, conditions for each of these three groups are identified separately.

a. Scrap and Waste Recycling Facilities (SIC 5093) (nonliquid recyclable wastes). The scrap recycling and waste recycling industry reclaims, processes and provides wholesale distribution of a diversity of materials and products. Typical recyclable materials include ferrous and nonferrous metals, paper, cardboard, animal hides, glass and plastic. Inbound recyclable materials are processed onsite in order to achieve a uniform grade product that meets a particular manufacturer's specifications. A significant inventory of processing equipment is frequently required to process recyclable waste material into a uniform grade. Processing equipment typically employ enormous physical forces such as shearing, shredding, and compacting in the process of eventually achieving a desired uniform grade product.

Individual scrap and waste recycling facilities may process one or more types of recyclable materials at a single site. Depending on the requirements of a manufacturer, recyclable waste materials, e.g., paper and cardboard, may need to be stored under cover to prevent deterioration. The bulk size of the recyclable waste materials and the processing equipment associated with these facilities frequently necessitates stockpiling materials and equipment outdoors. Consequently, there is significant opportunity for exposure of storm water runoff to pollutants. The extent of material potentially exposed to storm water runoff is illustrated in the following table based on information provided from one group application consisting of approximately 1,100 members.

TABLE N–1.—PERCENTAGE OF APPLICANTS IN ONE GROUP APPLICATION THAT PROVIDE COVER OVER MATERIALS OR PROCESSES

Material/processes	Percent of applicants
Ferrous Materials	6.6
Nonferrous Materials	53
Glass/plastic/paper	14
Other Materials	1.7
Material Processing Equipment	43

There are at least four types of activities that are common to most scrap and waste recycling facilities, they include: scrap waste material stockpiling, material processing, segregating processed materials into uniform grades, and collecting nonrecyclable materials for disposal. This fact sheet outlines pollutants of concern associated with each of these types of activities. Other operations of concern, including vehicle and equipment maintenance, are also discussed in this fact sheet.

(1) Pollutants Associated With Material Stockpiling. During material stockpiling, including unloading and loading areas, the potential exists for some types of inbound recyclable materials to deposit residual fluids on the ground. Used automotive engines, radiators, brake fluid reservoirs, transmission housings, and lead-acid from batteries may contain residual fluids that, if not properly managed, can eventually come in contact with storm water runoff. For example, sampling data from two group applications indicated the presence of oil and grease in 103 individual grab samples. In response to other Federal and State environmental regulations, such as the Resource Conservation and Recovery Act (RCRA), many scrap recycling and waste recycling facilities have instituted inspection and supplier education programs to minimize or eliminate the amount of inbound recyclable materials containing fluids and other potentially hazardous materials prior to their acceptance. Part XI.N.3.a.(3)(a)(i) of today's permit imposes conditions that will make an inbound recyclable materials inspection program part of the pollution prevention plan.

Another concern of outdoor stockpiling, including unloading and loading areas, is associated with deterioration of materials. Metal surfaces that are stockpiled for extended periods may be subject to corrosion. Corrosion is the deterioration of metal surfaces that typically results in the loss of metal to a solution, i.e., water. The following metals are referred to as the

galvanic (or electromotive) series and have a tendency to corrode and become soluble in water; magnesium, aluminum, cadmium, zinc, steel or iron, cast iron, chromium, tin, lead, nickel, soft and silver solder, copper, stainless steel, silver, gold, platinum, brass and bronze. For some metals, the extent and rate of corrosion is dependent on whether it occurs in an oxygen-starved or oxygen-abundant atmosphere.

Corrosion of stockpiled materials at scrap recycling facilities is a potential source of pollutants given that metals such as copper, lead, nickel, zinc, chromium and cadmium were frequently detected in sampling data. In addition, the majority of these metals are associated with recyclable materials handled by the scrap recycling industry. Part XI.N.3.a.(3) of today's permit identifies BMP options to address these sources.

Another significant material of concern is the acceptance and temporary storage of scrap lead acid batteries from automotive vehicles and equipment. If a battery casing becomes cracked or damaged, special precautions are necessary to ensure that the contents do not come in contact with storm water runoff. This includes battery terminals with visible corrosion. In all cases, used batteries shall be handled and stored in such a manner as to prevent exposure to either precipitation or runoff. Part XI.N.3.a.(3) addresses conditions for these sources.

The following table presents a list of typical materials that may be received and processed at a scrap and waste recycling facility and which may be potential pollutant sources if they are not managed properly.

TABLE N–2.—SIGNIFICANT MATERIALS POTENTIALLY EXPOSED TO STORM WATER RUNOFF AT SCRAP AND WASTE RECYCLING FACILITIES [1]

Significant materials	Potential sources	Pollutants of concern
White goods (appliances)	Leaking oil-filled capacitors, ballasts, leaking compressors, pumps, leaking pressure vessels, reservoirs, sealed electrical components and chipped or deteriorated painted surfaces.	PCBs, oil, lubricants, paint pigments or additives such as lead, and other heavy metals.
Ferrous and nonferrous turnings and cuttings	Cutting oil residue, metallic fines	Oil, heavy metals.
Materials from demolition projects	Deteriorated/damaged insulation, chipped painted surfaces, lead, copper, and steel pipes.	Asbestos fibers, lead, copper, zinc, cadmium, other metals, TKN.
Electrical components, transformers, switch gear, mercury float switches, sensors.	Leaking oil-filled transformer casings, oil-filled switch, float switches, radioactive materials in gauges, sensors.	PCBs, oils, mercury, ionizing radioactive isotopes.
Fluorescent lights, light fixtures	Leaking ballasts	PCBs, oil.
Food/beverage dispensing equipment	Leaking fluorescent light ballasts, chipped painted surfaces.	PCBs, oil, heavy metals from paint pigments and additives.
Hospital and dental waste and equipment	Drums/containers of hospital waste, shielding from diagnostic and other medical equipment, radioactive materials from gauges, sensors and diagnostic equipment.	Infectious/bacterial contamination, lead, ionizing radioactive isotopes.
Instruments	Radioactive material from thickness gages	Ionizing radioactive isotopes.
Insulated wire	Insulation and other coatings, wire	Lead, zinc, copper.
Lawnmowers, snowmobiles, motorcycles	Leaking engines, transmissions, fuel, oil reservoirs,leaking batteries.	Oils, transmission and brake fluids, fuel, grease, battery acid, lead acid.
Light gage materials	Deteriorating insulation, painted surfaces and other coatings.	Asbestos, lead, chromium.
Locomotives, rail cars	Leaking fuel reservoirs, fittings, hydraulic components, engines, bearings, compressors, oil reservoirs, worn brake pads, damaged insulation.	PCBs, diesel fuel, hydraulic oil, oil, brake fluid, grease from fittings, asbestos.
Motor vehicle bodies, engines, transmissions, exhaust systems.	Leaking fuel tanks, oil reservoirs, transmission housings, brake fluid reservoir and lines, brake cylinders, shock absorber casing, engine coolant, wheel weights, leaking battery casings/housings and corroded terminals, painted surfaces and corrosion inhibitors, exhaust system, catalytic converters.	Fuel, benzene, oil, hydraulic oil, transmission fluids, brake fluids, ethylene glycol (antifreeze), lead, lead acid, lead oxides, cadmium, zinc, other heavy metals.
Miscellaneous machinery and obsolete equipment.	Leaking reservoirs, damaged or chipped painted surfaces/coatings.	Fuel, oil, lubricants, lead, cadmium, zinc.
Pipes/materials from chemical and industrial plants.	Chemical residue, insulation, lead piping, chipped or damaged painted surfaces and protective coatings.	Chemical residue, oil, lubricants, damaged insulation (asbestos), lead, cadmium, zinc, copper.
Sealed containers, hydraulic cylinders	Leaking liquid reservoirs, containers, cylinders, miscellaneous chemicals.	Oil, PCBs, solvents, chemical residue.
Salvaged construction materials	Chemical residues, oils, solvents, lubricants, damaged insulation, chipped painted surfaces and protective coatings.	Chemical residue, oily wastes, asbestos, lead, cadmium, zinc.
Tanks, containers, vessels, cans, drums	Leaking or damaged containers	Chemical residue, oily wastes, petroleum products, heating oil.
Transformers (oil filled)	Leaking transformer housings	PCBs, oil.

[1] Institute of Scrap Recycling Industries, Inc.'s "Environmental Operating Guidelines." (April 1992)

(2) Material Processing. The type of processes employed at a particular facility depends on the type of recyclable and waste material. Typical processes include: torch cutting, shredding, baling, briquetting, wire stripping and chopping, and compacting. Processes such as shredding and shearing reduce the bulk size of recyclable scrap and waste into a size that is more easily transportable and which allows separation into uniform grades based on manufacturer specifications. Processes such as shredding of automotive bodies include a means of segregating materials into their ferrous and nonferrous fractions.

Process equipment at scrap recycling and waste recycling facilities are also potential sources of pollutants in storm water runoff. The sources of concern will be discussed separately. Scrap process equipment such as shearers are often actuated by a hydraulic system. Components such as hydraulic reservoirs, hydraulic pumps, motors, cylinders, control valves, accumulators, filters, and fittings are prone to leaking hydraulic fluid. Some hydraulic machinery also require frequent lubrication of cutting and wear surfaces. Storm water runoff exposure to hydraulic fluids and other lubricants is very likely unless adequate source control measures such as good housekeeping, preventive maintenance, diversion and/or containment are provided.

Stationary process equipment also produce a substantial amount of residual particulate material that tends to accumulate on and around the equipment, particularly rotating machinery, moving parts, bearings, conveyors and at the output of the equipment, e.g., storage containers. Particulate material that accumulates can become a source of contamination if it comes in contact with both precipitation and storm water runoff. Other sources of residual particulate and waste material include air pollution equipment, material handling equipment and processing equipment. In the case of shredding equipment, there are typically three (3) separate material streams produced. Shredded material is ultimately separated into its ferrous and nonferrous fractions, and a third stream referred to as fluff. The fluff material consists of a heterogeneous mix of materials including, but not limited to, small metal fragments, plastics, rubber, wood and textiles. After the material exits the shredder (hammermill), it typically enters an air classification system that separates the lightweight fraction, e.g., particulates, from the more dense fraction. The ferrous metal fraction is then separated from the nonferrous fraction and fluff by the use of a magnetic separator (typically a belt- or drum-type magnetic separator). The separated material may be collected in a hopper or it may accumulate on the ground. If recyclable and nonrecyclable waste material is allowed to accumulate on the ground, a greater potential exists for this material to come in contact with either precipitation or storm water runoff.

The scrap and recycling industry uses a diversity of processes to reclaim and recycle materials that can contribute pollutants to storm water runoff. The following table presents a list of typical scrap equipment operations which are potential pollutant sources.

TABLE N–3.—TYPICAL PROCESS AND EQUIPMENT OPERATIONS THAT ARE LIKELY SOURCES OF POLLUTANTS[1]

Activity	Potential sources	Pollutants of concern
Air Pollution Equipment (including incinerators, furnaces, wet scrubbers, filter houses, bag houses).	Normal equipment operations that include the collection and disposal of filter bag material and ash, process wastewater from scrubbers, accumulation of particulate matter around leaking joint connections, malfunctioning pumps and motors, e.g., leaking gaskets, seals or pipe connections, leaking oil-filled transformer casings.	Hydraulic fluids, oils, fuels, grease and other lubricants, accumulated particulate matter, chemical additives, PCBs from oil-filled electrical equipment.
Combustion Engines	Spills and/or leaks from fueling tanks, spills/leaks from oil/hydraulic fuel reservoirs, faulty/leaking hose connections, worn gaskets, leaking transmission crankcases and brake systems (if applicable), leaking battery casings and/or corroded terminals.	Accumulated particulate matter, oil/lubricants, fuel (gas/diesel), fuel additives, antifreeze (ethylene glycol), battery acid, products of incomplete combustion.
Material Handling Systems (forklifts, cranes, conveyors).	Normal operations including spills and leaks from fuel tanks, hydraulic and oil reservoirs due to malfunction parts, e.g., worn gaskets and parts, leaking hose connections, and faulty seals. Damaged or faulty electrical switches (mercury filled) Damaged or leaking battery casings, including exposed corroded battery terminals. Damaged or worn bearing housings.	Hydraulic fluids, oils, fuels and fuel additives, grease and other lubricants, accumulated particulate matter, chemical additives, mercury, lead, battery fluids.
Stationary Scrap Processing Facilities (balers, briquetters, shredders, shearers, compactors, engine block/cast iron breakers, wire chopper, turnings crusher).	Normal equipment operations including leaks from hydraulic reservoirs, hose and fitting connections, worn gaskets, spills or leaks from fuel tanks, particulates/residue from scrap processing, malfunctioning pumps and motors, e.g., leaking gaskets, seals or pipe connections, leaking oil-filled transformer casings.	Heavy metals, e.g., zinc, copper, lead, cadmium, chromium, hydraulic fluids.
Hydraulic equipment and systems, balers/briquetter, shredders, shearers, compactors, engine block/cast iron breaker, wire chopper, turnings crusher.	Particulate/residue from material processing, spills and/or leaks from fueling tanks, spills/leaks from oil/hydraulic fuel reservoirs, faulty/leaking hose connections/fittings, leaking gaskets.	Hydraulic fluids/oils, lubricants, particulate matter from combustion engines, PCBs (oil-filled electrical equipment components), heavy metals (nonferrous, ferrous).

TABLE N–3.—TYPICAL PROCESS AND EQUIPMENT OPERATIONS THAT ARE LIKELY SOURCES OF POLLUTANTS[i]—Continued

Activity	Potential sources	Pollutants of concern
Electrical Control Systems (transformers, electrical switch gear, motor starters).	Oil leakage from transformers, leakage from mercury float switches, faulty detection devices.	PCBs, mercury (float switches), ionizing radioactive material (fire/smoke detection systems).
Torch cutting	Residual/accumulated particulates	Heavy metal fragments, fines.

[i] Institute of Scrap Recycling Industries, Inc.'s "Environmental Operating Guidelines." (April 1992)

(3) Segregation of Processed Materials into Uniform Grades. Processing, e.g., shearing, shredding, baling, etc., of recyclable materials is followed by its segregation into uniform grades to meet a particular manufacturer's specifications. If segregated recyclable material remains exposed to precipitation, the potential still exists for storm water contamination.

(4) Disposal of Nonrecyclable Waste Materials. During recycling of scrap and waste materials, a significant fraction of nonrecyclable waste materials is generated and must be disposed of properly. The volume or quantity of material that remains nonrecyclable may be too large to allow covered storage prior to shipment. Consequently, nonrecyclable waste materials may be left exposed to both precipitation and runoff and, therefore, they are a likely source of storm water pollutants.

(5) Other Operations of Concern. There are a number of activities of concern that frequently occur at scrap and waste recycling facilities including, heavy vehicle traffic over unstabilized areas, vehicle maintenance and fueling, and material handling operations. Operations associated with the receipt, handling, and processing of scrap and waste material frequently occur over areas that are not stabilized to prevent erosion. Unless specific measures or controls are provided to either prevent erosion or trap the sediment, this material will be carried away in storm water runoff and eventually exit the site. Suspended solids are of significant concern given the potential amount of unstabilized area and the significant amount of particulate matter that is often produced at these facilities. For example, many facilities use spray water for dust control on heavily traveled areas. Both organic and inorganic pollutants can become bound up or absorbed to suspended solids in runoff. For this reason, today's proposed permit identifies conditions to minimize the contribution of suspended solid loadings from these facilities.

Some scrap and waste recycling facilities may also conduct vehicle maintenance onsite. Although vehicle maintenance frequently occurs indoors, there are specific activities which could contribute pollutants to storm water. This includes washdown of vehicle maintenance areas, leaks or spills of fuel, hydraulic fluids and oil and outdoor storage of lubricants, fluids, oils and oily rags. Fueling stations are also frequently located outdoors without any roof cover. Activities such as topping off fuel tanks, or overfilling storage tanks (without high-level alarms or automatic shut-offs) are also activities that can cause contamination of runoff. Vehicle washing can result in accumulated residue material being discharged to a storm sewer system.

The following table highlights activities associated with vehicle maintenance and material handling that are potential sources of storm water contamination.

TABLE N–4.—OTHER POTENTIAL POLLUTANT SOURCE ACTIVITIES

Activity	Potential sources	Pollutants of concern
Material Handling Systems (forklifts, cranes, conveyors).	Spills and/or leaks from fueling tanks, spills/leaks from oil/hydraulic fuel reservoirs, faulty/leaking hose connections/fittings, leaking gaskets.	Accumulated particulate matter (ferrous and nonferrous metals, plastics, rubber, other), oil/lubricants, PCBs (electrical equipment), mercury (electrical controls), lead/battery acids.
Vehicle Maintenance	Parts cleaning, waste disposal of rags, oil filters, air filters, batteries, hydraulic fluids, transmission fluids, brake fluids, coolants, lubricants, degreasers, spent solvents.	Fuel (gas/diesel), fuel additives, oil/lubricants, heavy metals, brake fluids, transmission fluids, chlorinated solvents, arsenic.
Fueling Stations	Spills and leaks during fuel transfer, spills due to "topping off" tanks, runoff from fueling areas, washdown of fueling areas, leaking storage tanks, spills of oils, brake fluids, transmission fluids, engine coolants.	Gas/diesel fuel, fuel additives, oil, lubricants, heavy metals.
Vehicle and Equipment Cleaning and Washing	Washing and steam cleaning	Solvent cleaners, oil/lubricants/additives, antifreeze (ethylene glycol).

(6) Pollutants Found in Storm Water Discharges. Sampling data provided in part 2 of the group application process revealed that storm water discharges from scrap and waste recycling facilities contain pollutants such as heavy metals, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), TSS, nutrients and oil and grease. The following table summarizes the statistical analysis of sampling data provided in part 2 group applications. Table N–6 provides a comparison of a selected subset of these pollutants to benchmark concentrations.

TABLE N–5.—SUMMARY STATISTICS FOR SCRAP AND WASTE RECYCLING FACILITIES[i] (SIC 5093) (Nonliquid Recyclable Waste Materials.) All units in mg/L unless otherwise noted

Pollutant Sample type	No. of samples		Mean		Minimum		Maximum		Median		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
pH (std units)	136	N/A	N/A	N/A	4.93	N/A	10.2	N/A	N/A	N/A	9.58	N/A
BOD_5	131	120	23.49	24	0.00	0.00	330.0	360	9.0	9.0	330.0	330.0
COD	131	117	251.33	204	0.00	0.00	1588.0	2400	120.0	110.0	1323	1014
TSS	131	116	437.11	375	0.00	0.00	3894	6042	148.0	84.5	3100	4860
Nitrate + Nitrite N	130	117	1.76	5.9	0.00	0.00	84.0	220.0	0.61	0.80	28	129.0
TKN	132	114	3.44	3.4	0.00	0.00	43.0	39.0	2.05	2.20	25	22.0
Oil and Grease	136	N/A	8.95	N/A	0.00	N/A	85.0	N/A	5.0	N/A	69	N/A
Total P	133	114	0.81	0.77	0.00	0.00	36.0	29.0	0.29	0.28	4.7	10.0
Total Pb	103	100	0.85	0.84	0.00	0.00	8.70	13.00	0.205	0.215	4.9	11.00
Total Cd	75	73	0.02	0.02	0.000	0.000	0.10	0.65	0.0074	0.005	0.069	.65
Total Cu	102	99	0.77	0.60	0.000	0.000	12.0	8.20	0.26	0.22	5.98	8.2
Total Zn	97	94	3.16	3.2	0.028	0.000	22.0	38.0	1.50	1.4	22.0	38.0
Total Cr	103	100	0.08	0.122	0.000	0.000	2.10	2.60	0.03	0.02	0.547	2.3
Total Fe	5	5	25.4	9.80	0.8	0.0	74.0	20.0	10.0	14.0	72.7	19.8
Total Ni	94	93	0.202	0.21	0.001	0.000	5.80	7.30	0.05	0.040	5.8	7.3
Arsenic	9	8	0.038	0.019	0.00	0.00	0.170	0.90	0.005	0.005	0.170	0.090
Total Al	5	3	4.86	3.327	.68	.68	10.0	7.6	4.0	1.70	10.0	7.6
PCB–1016	27	26	0.001	0.051	0.001	0.001	0.010	1.30	0.001	0.001	0.010	1.3
PCB–1221	26	24	0.001	0.001	0.001	0.000	0.010	0.001	0.001	0.001	0.010	0.001
PCB–1232	28	26	0.001	0.001	0.001	0.000	0.010	0.001	0.001	0.001	0.010	0.001
PCB–1242	27	26	0.001	0.047	0.000	0.000	0.010	1.30	0.001	0.001	0.010	1.3
PCB–1248	26	24	0.003	0.005	0.000	0.000	0.025	0.078	0.001	0.001	0.025	0.078
PCB–1254	28	26	0.001	0.001	0.000	0.000	0.010	0.006	0.001	0.001	0.010	0.006
PCB–1260	28	26	0.002	0.049	0.001	0.000	0.011	1.30	0.001	0.001	0.011	1.3

[i] Applicants that did not report the units of measurement for the reported values were not included in these statistics.
[ii] Composite samples.

TABLE N–6.—COMPARISON SAMPLING DATA FOR SELECTED PARAMETERS VERSUS BENCHMARK CONCENTRATIONS (MG/L)

Pollutant Sample type	Mean		Maximum		Median		Benchmark
	Grab	Comp	Grab	Comp	Grab	Comp	
COD	251	204	1588	2400	120	110	120
TSS	437	375	3894	6042	148	84.5	100
Total Pb	0.85	0.84	8.70	13.00	0.205	0.215	0.0816
Total Cu	0.77	0.60	12.0	8.20	0.26	0.22	0.0636
Total Fe	25.4	9.80	74.00	20.00	10.00	14.00	1.0
Total Al	4.86	3.327	10.0	7.6	4.0	1.70	0.075
Total Zn	N/A	3.2	22.0	38.0	1.5	1.4	0.065

b. Waste Recycling Facilities (SIC 5093)—(Liquid Recyclable Wastes). This subsection applies to those facilities engaged in the reclaiming and recycling of liquid wastes such as "spent solvents," "used oil," and "used ethylene glycol" typically identified under SIC 5093. This subsection is particularly applicable to those facilities that participated in EPA group application number 195. EPA received a single group application in this category of waste recycling facilities. The following is a profile of industrial activities and the types of significant materials associated with facilities participating in this group activity.

Group application number 195 included 220 facilities of which 214 were classified as service centers. Service centers accumulate spent solvent, used oil and antifreeze, filter cartridges and still bottoms contaminated with dry cleaning solvents (typically perchloroethylene), and used lacquer thinner from paint gun cleaning machines. The typical service center has individual containers with storage capacity of up to 10,000 gallons each, and tanks with storage capacity of up to 20,000 gallons each. Service centers are typically limited to a maximum of 6 tanks (a total of 120,000 gallons). Twenty (20) of the service centers also function as accumulation centers where they have a maximum storage capacity of 70,000 gallons of liquid materials in containers. None of the containers are opened except under conditions where a container begins to leak or is damaged.

The group application also included four (4) facilities that operated only as container transfer stations and do not operate storage tanks. These facilities are largely enclosed warehouses that provide secondarily contained storage areas. Three (3) facilities were identified as used oil depots where only oily water and/or used oil are accumulated in storage tanks. Storage tanks are limited to a maximum capacity of 20,000 gallons each. Used oil is transported to the facility in tanker trucks (3,500 gallons) and shipped out in tanker trucks (7,500 gallons). The used oil is ultimately transported to a processing or re-refining facility (not covered under this section). The following table summarizes the percentage of facilities with significant materials stored.

TABLE N–7. SIGNIFICANT MATERIALS REPORTED IN GROUP APPLICATION NUMBER 195

Significant materials	Percent of facilities
Mineral Spirits	98
Immersion Cleaner	98
Dry Cleaner Solvents	98
Paint Solvents	83
Industrial Solvents	81
Spent Antifreeze	59
Used Oil	57
Allied Products	98

The types of materials identified in Table N–7 are potential sources of storm water runoff contamination. Since these materials are stored and transported in individual drums and bulk storage tanks, the potential exists for spills and/or leaks during all phases of waste transport, waste transfer, container/drum handling and shipping.

There are a number of operations at these facilities that have significant potential to release pollutants to the environment if recyclable waste materials are not managed properly. Potential sources of pollutants are discussed in Part XI.N.3.a.(2) of today's permit. However, in response to other Federal and State environmental regulations, such as RCRA and 40 CFR Part 112 (Oil Pollution Prevention), facilities in this group application currently employ a range of the BMPs and structural controls that also benefit storm water quality. Typical measures and controls for controlling pollutants for facilities in this subsection are presented in Part XI.N.3.a.(3)(b).

(1) Waste Material Handling and Storage. Given the nature and type of materials stored and handled at these facilities, the potential exists for accidental spills and leaks. Consequently, the types of activities that occur at these facilities which could potentially result in contamination of storm water runoff is also of concern to EPA. The following table is a list of activities which may result in a release of pollutants.

TABLE N–8. TYPES OF POTENTIAL POLLUTANT-CAUSING ACTIVITIES AT WASTE RECYCLING FACILITIES THAT HANDLE LIQUID RECYCLABLE WASTES

Activity	Potential sources of pollutants	Pollutants of concern
Drum/Individual Container Storage and Handling.	Leaks or spills due to faulty container/drum integrity, e.g., leaking seals or ports. Container materials incompatible with waste material. Improper stacking and storage of containers.	Mineral spirits, industrial solvents, immersion cleaners, dry cleaner solvents, paint solvents, spent antifreeze.
Return and Fill Stations	Leaks, spills, or overflows from tanker truck transfer of wastes and hose drainage. Leaking pipes, valves, pumps, worn or deteriorated gaskets or seals.	Mineral spirits, industrial solvents, immersion cleaners, dry cleaner solvents, paint solvents, spent antifreeze.
Individual Container/Drum Storage Improper Stacking and Storage of Containers.	Leaks or spills due to faulty container/drum integrity, e.g., leaking seals or ports.	Mineral spirits, industrial solvents, immersion cleaners, dry cleaner solvents, paint solvents, spent antifreeze.
Storage Tank Operations	Overfill of storage tanks, leaking pipes, valves, worn or deteriorated pumps seals. Leaking underground storage tanks.	Mineral spirits, industrial solvents, immersion cleaners, dry cleaner solvents, paint solvents, spent antifreeze.
Material Handling Equipment	Leaking fuel lines, worn gaskets, leaking hydraulic lines and connections.	Fuel, hydraulic fluid, oil and grease.

(2). Other Activities of Concern. The following table highlights other types of activities that are potential sources of storm water contamination.

TABLE N–9. OTHER POTENTIAL SOURCES OF STORM WATER CONTAMINATION

Activity	Potential sources of pollutants	Pollutants of concern
Vehicle and Equipment Maintenance (if applicable).	Replacement of fluids such as transmission and brake fluids, antifreeze, oil and other lubricants, washdown of maintenance areas, dumping fluids down floor drains connected to storm sewer system, outside storage of fluids and oily rags and waste material.	Oil and grease, fuel, accumulated particulate matter, antifreeze.
Vehicle or Equipment Washing (if applicable)	Wash water or steam cleaning	Oil, detergents, chlorinated solvents, suspended solids and accumulated particulate matter.

(3). Pollutants Found in Storm Water Discharges. Based on data provided in group application sampling information, pollutants that were most frequently reported included TSS, BOD, COD, nitrite plus nitrate, oil and grease. The following table provides a statistical summary of data.

TABLE N–10. SUMMARY STATISTICS FOR WASTE RECYCLING FACILITIES[i] (SIC 5093)—(RECYCLABLE LIQUID WASTES). ALL VALUES IN MG/L

Parameter Sample type	# of Samples		Mean		Min		Max		Median		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	22	17	18	9	2	2	94	48	5	5	79	38

TABLE N–10. SUMMARY STATISTICS FOR WASTE RECYCLING FACILITIES[i] (SIC 5093)—(RECYCLABLE LIQUID WASTES). ALL VALUES IN MG/L—Continued

Parameter Sample type	# of Samples		Mean		Min		Max		Median		99th percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
COD	22	17	133	83	12	5	660	400	45	45	449	320
TSS	21	16	51	28	5	5	500	84	28	20	68	59
Nitrite + Nitrate	22	17	0.90	0.78	0.05	0.05	3.70	3.50	0.61	0.38	3.45	3.29
TKN	22	17	3.1	2.0	1.0	1.0	11.0	6.0	1.5	1.0	9.9	5.7
Oil and Grease	22	N/A	1.8	N/A	1.0	N/A	5.0	N/A	1.5	N/A	4.0	N/A

[i] Applicants that did not report the units of measurement for the reported values were not included in these statistics.
[ii] Composite samples.

c. *Recycling Facilities.* This particular group of recycling facilities is distinguished from scrap recycling facilities and waste recycling facilities that accept a mixed wastestream of non-recyclable and recyclable wastes. Facilities included in this sub-sector would include only those facilities that receive source-separated, recyclable materials primarily from non-industrial and residential sources. This includes source-separated material recovery facilities (MRF). EPA Group Applications 274, 647, 826, and 1145 included significant numbers of facilities that would fall within this sub-sector. The recyclable materials in this sub-sector can be characterized as common consumer products such as paper, newspaper, cardboard, plastic containers, glass bottles, aluminum and tin cans. These facilities commonly accept a mix of recyclable materials and reject non-recyclable materials at the source.

(1) *Pollutant-Causing Activities Associated with Recycling Facilities.* There are basically four areas associated with these facilities that are potential sources of pollutants, they include: (1) Inbound recyclable materials; (2) outdoor material storage; (3) indoor storage and material processing; and (4) vehicle maintenance. The potential exists that recycling facilities may unknowingly accept nonrecyclable materials and/or small quantities of household hazardous wastes (HHW). If these materials are not handled, stored or disposed of properly, they could become potential pollutant sources. Recycling facilities are already aware of this issue and have commonly instituted practices to minimize accepting such materials. These practices include public education brochures, training of curbside pick-up drivers, and rejecting non-recyclable materials at the source.

Outdoor material storage is another issue of concern given the practice of storing degradable, recyclable products outdoors such as bales of wastepaper and various types of recyclable containers containing residual fluids, e.g., beverage containers. Wastepaper exposed to weather will deteriorate and can be a source of oxygen-demanding substances. For example, biochemical oxygen demand (BOD) concentrations as high as 152 mg/l were measured at facilities that store wastepaper outdoors. Similarly, recycling facilities that stored unprocessed aluminum beverage containers outdoors can be a contaminant source of oxygen-demanding substances. BOD concentrations as high as 460 mg/l were measured at recycling facilities that store unprocessed recyclable containers outdoors.

The third area of concern is indoor processing and storage. EPA is primarily concerned with the potential for illicit connections or improper dumping to floor drains that discharge to a storm sewer system. Another potential source of contamination is the practice of washing down tipping floor areas and allowing the washwater to drain to the storm sewer system. EPA believes that these issues can be readily addressed by disconnecting floor drains to the storm sewer, good housekeeping practices and providing routine employee training. The practice of allowing tipping floor washwaters to discharge to a storm sewer system is prohibited under this permit.

The last area of concern is vehicle maintenance. Onsite vehicle maintenance was infrequently reported in group permit applications. Although vehicle maintenance frequently occurs indoors, the following specific activities could contribute pollutants to storm water: washdown of vehicle maintenance areas, leaks or spills of fuel, hydraulic fluids, lubricants, and other fluids, and exposed oils and oily rags. Fueling areas may lack roof cover, consequently, topping off fuel tanks or overfilling storage tanks (without high-level alarms) could contribute to contamination of surface runoff. Vehicle washing can result in accumulated residue material being discharged to a storm sewer system. The following tables identify significant materials that are exposed to precipitation or runoff based on information from two group applications (274 and 647).

TABLE N–11.—SIGNIFICANT MATERIALS REPORTED IN GROUP APPLICATION NO. 274

Significant materials	Percent of facilities[i]	Pollutant-causing activities
Paper Stock	43	Outdoor exposure could result in deterioration of paper.
Wood Pallets	83	Residual materials on pallets.
Recyclable Waste Paper in Bales	83	Outdoor exposure could result in deterioration of paper.
Recyclables Plastic, Glass, and Aluminum	30	Residual fluids from containers.
Gasoline/Diesel Fuel (outside pumps)	28	Leaks or spills. Overtopping during fueling.

[i] Column totals greater than 100% because many facilities have one or more of these significant materials exposed.

TABLE N–12.—Significant Materials Reported in Group Application No. 826

Significant materials	Percent of facilities[i]	Pollutant-causing activity
Wood Pallets	64	Residual materials on pallets.
Waste Paper	27	Outdoor exposure could result in deterioration of paper.
Recyclable Waste Paper in Bales	41	Outdoor exposure could result in deterioration of paper.
Gasoline/Diesel Fuel (outside pumps)	55	Leaks or spills. Overtopping during fueling.
Lubricating Fluids	14	Leaks or spills.

[i] Column totals greater than 100% because many facilities have one or more of these significant materials exposed.

EPA has established special pollution prevention plan requirements for recycling facilities that receive only source-separated recyclable materials. Specific requirements are discussed in Part XI.N.3.a.(3)(c) of the permit.

(2) Pollutants Found in Storm Water Discharges.

Based on data provided in group applications 274, 647, 826, and 1145, pollutants that were most frequently reported included TSS, BOD, COD, nitrite plus nitrate, TKN, total phosphorus, oil and grease, and total aluminum (group 1145 only). The table N–13 provides a statistical summary of data.

TABLE N–13.—SUMMARY STATISTICS FOR SELECTED RECYCLING FACILITIES[i] (SIC 5093) (GROUP APPLICATIONS 247, 647, 826, AND 1145) ALL UNITS IN mg/L UNLESS OTHERWISE NOTED

Pollutant, Sample type	# of Samples	Comp[ii]	Mean		Minimum		Maximum		Median		95th percentile	
	Grab		Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	.....	.....	31	22	0	0	460	220	31	22	78	75
COD	.....	.....	179	118	0	0	1200	940	73	43	1005	441
TSS	.....	.....	495	383	0	0	7440	4860	73	40	1731	2754
Nitrate + Nitrite N	.....	.....	0.60	0.76	0	0	13	69	0.41	0.37	1.61	1.33
TKN	.....	.....	1.48	1.78	0	0	6.90	16.85	1.01	0.79	6.12	7.30
Oil and Grease	.....	.....	9.4	0.7	0	0	69.0	13.0	3.0	0.0	32.4	4.9
Total P	.....	.....	0.22	0.19	0	0	7.60	2.20	0.22	0.19	2.17	1.14
Total Al[iii]	.....	.....	5.51	1.55	0	0	44.0	5.40	1.20	0.90	26.00	4.80

[i] Applicants that did not report the units of measurement for the reported values were not included in these statistics.
[ii] Composite samples.
[iii] Values reported for Group Application No. 1145.

3. Options for Controlling Pollutants

a. Scrap and Waste Recycling Facilities (SIC 5093) (Nonliquid recyclable waste materials). This section addresses source control measures, BMPs and structural controls that are specifically applicable to the scrap recycling facilities (SIC 5093) and waste recycling facilities (SIC 5093) and which are engaged in the reclaiming and recycling of solid materials such as ferrous and nonferrous metals, plastics, paper, glass and cardboard and automotive parts.

The BMPs described in this subsection are specifically applicable to scrap recycling and waste recycling facilities. Scrap recycling and waste recycling facilities applying for coverage under Part XI.N. of today's permit shall employ a broad and comprehensive range of BMPs and source control measures to minimize and/or eliminate the diversity of pollutants associated with scrap processing operations. In instances where facilities conduct certain operations indoors or under cover, a determination will be made by the owner/operator of the facility as to the applicability of these BMPs and source control measures to these particular activities.

The following table summarizes alternative source control measures, nonstructural BMPs (BMPs), and structural controls that are associated with and applicable to scrap and waste processing facilities (SIC 5093) (nonliquid recyclable materials).

TABLE N–14.— SUMMARY OF ALTERNATIVE BMP OPTIONS FOR SCRAP AND WASTE RECYCLING PROCESSING FACILITIES

Activity	BMP alternatives
Inbound Recyclable and Waste Material Control.	Establish program to encourage suppliers of scrap, waste and other salvageable materials to drain residual fluids prior to arrival at the facility.
	Establish acceptance program for handling, storage and disposal of lead-acid batteries.
	Establish procedures for rejecting or handling, storing and disposal of hazardous wastes and other nonhazardous residual fluids.
	Establish procedures to properly handle industrial turnings and cuttings and prohibiting cutting oils and metallic fines from coming in contact with runoff.
	Identify inspector training requirements.
Outside Scrap Material Storage: (liquids)	Conduct inspections for fluids, e.g., oils, transmission fluids, antifreeze, brake fluid, and fuels. Establish handling/ storage/disposal procedures for these materials.

TABLE N–14.— SUMMARY OF ALTERNATIVE BMP OPTIONS FOR SCRAP AND WASTE RECYCLING PROCESSING FACILITIES—Continued

Activity	BMP alternatives
	Drain and collect liquids in a designated area. Provide covered storage or impervious areas with curbing/berms or other appropriate containment. Stored liquid materials in covered areas or impervious areas with curbing/berms or other appropriate measure.
	Establish spill prevention procedures.
	Provide adequate supply of materials for dry clean up of spills or leaks.
	Prevent runoff into liquid storage areas. Store liquid wastes in materially compatible containers. Minimize/eliminate the accumulation of liquid wastes.
	Establish procedures if hazardous wastes are discovered after material accepted.
	Conduct periodic inspections of storage areas.
	Conduct preventative maintenance of BMPs as necessary.
Outside Scrap Material Storage: (bulk solid materials).	Minimize runoff from coming into areas where significant materials are stored, e.g., diversion structures such as curbing, berms, containment trenches, surface grading, and elevated concrete pads or other equivalent measure.
	Use adsorbents to collect leaking or spills of oil, fuel, transmission and brake fluids, e.g., dry absorbent, drip pans.
	Install media filters such as catch basin filters and sand filters.
	Install oil/water separator in storage areas with vehicle transmissions and engines. Locate spill plans under stored vehicles.
	Provide nonrecyclable waste storage bins and containers.
	Conduct periodic inspections.
	Conduct preventative maintenance as necessary.
	Provide equipment operator training to minimize damage to controls, e.g., curbing and berms.
Storage Other: (lightweight materials)	Identify/provide supplier training or information bulletins on requirements for acceptance of lightweight materials.
	Encourage supplier participation in program to minimize/eliminate, as practicable, volume of semi-solid and liquid residues in recyclable materials, e.g., residual fluids in aluminum and plastic containers.
	Provide covered storage, container bins or equivalent for lighter-weight materials such as glass, plastics, aluminum cans, paper, cardboard.
	Minimize/eliminate residue from bottles, containers, etc. from coming in contact with runoff. Establish dry clean up methods.
	Establish procedures and employee training for the handling, storage and disposal of residual fluids from small containers.
	Prohibit washdown of tipping floor areas.
	Provide good housekeeping to eliminate particulate and residual materials buildup. Establish cleaning schedule for high traffic areas.
	Provide covered disposal containers or equivalent for residual waste materials.
	Eliminate floor drains discharging to storm sewer.
Scrap Processing Operations:	Provide training to equipment operators on how to minimize exposure of runoff to scrap processing areas.
	Schedule frequent cleaning of accumulated fluids and particulate residue around all scrap processing equipment.
	Schedule frequent inspections of equipment for spills or leakage of fluids, oil, fuel, hydraulic fluids.
	Conduct routine preventive maintenance of equipment per original manufacturer's equipment (OME) recommendations. Replace worn or malfunctioning parts.
	Site process equipment on elevated concrete pads or provide runoff diversion structures around process equipment, berms, containment trenches or surface grading or other equivalent measure. Discharge runoff from within bermed areas to a sump, oil/water separator, media filter or discharge to sanitary sewer.
	Conduct periodic maintenance and clean out of all sumps, oil/water separators, media filters. Dispose of residual waste materials properly, e.g., according to RCRA.
	Provide curbing, dikes, and berms around scrap processing equipment to prevent contact with runoff.
	Where practicable, locate process equipment e.g., balers, briquetters, small compactors, under an appropriate cover.
	Provide cover over hydraulic equipment and combustion engines. Provide dry-clean up materials, e.g., dry-adsorbents, drip pans, absorbent booms, etc. to prevent contact of hydraulic fluids, oils, fuels, etc., with storm water runoff.
	Provide alarm, pump shutoff, or sufficient containment for hydraulic reservoirs in the event of a line break.
	Stabilize high traffic areas, e.g., concrete pads, gravel, pavement, around processing equipment, where practicable.
	Provide site gages or overfill protection devices for all liquid and fuel storage reservoirs and tanks.
	Establish spill prevention and response procedures, including employee training.
	Provide containment bins or equivalent for shredded material, especially lightweight materials such as fluff (preferably at the discharge of these materials from the air classification system).
Supplies for Process Equipment	Locate storage drums containing liquids, including oils and lubricants indoors. Alternatively, site palletized drums and containers on an impervious surface and provide sufficient containment around the materials. Provide sumps, oil/water separators, if necessary.

TABLE N–14.— SUMMARY OF ALTERNATIVE BMP OPTIONS FOR SCRAP AND WASTE RECYCLING PROCESSING FACILITIES—Continued

Activity	BMP alternatives
	Conduct periodic inspections of containment areas and containers/drums for corrosion.
	Perform preventive maintenance of BMPs, as necessary.
	Instruct employees on proper material handling and storage procedures.
Scrap lead acid battery Program	Establish inspection and acceptance procedures for scrap lead-acid batteries.
	Provide supplier training on acceptance practices for scrap batteries.
	Provide employee training on the safe handling, storage and disposition of scrap batteries.
	Separate all scrap batteries from other scrap materials.
	Store scrap batteries under cover or equivalent.
	Establish procedures for the storage, handling, disposition of cracked or broken batteries in accordance with applicable Federal regulations, e.g., RCRA.
	Establish procedures to collect and dispose of leaking battery acid according to Federal regulations, e.g., RCRA.
	Provide covered storage or equivalent to prevent exposure to either precipitation or runoff.
Vehicle and Equipment Maintenance	Establish an inventory of materials used in the maintenance shop that could become a potential pollutant source with storm water runoff, e.g., fuels, solvents, oils, lubricants.
	Store and dispose of oily rags, filters (oil and air), batteries, engine coolant, transmission fluid, use oil, brake fluid, and solvents in a manner that minimizes potential contact with runoff and in compliance with State and Federal regulations.
	Label and track recycling of waste materials, e.g., batteries, solvent, used oil.
	Drain oil filters before disposal or recycling.
	Drain all fluids from all parts or components that will become scrap material or secondhand parts.
	Store liquid waste materials in compatible containers.
	Store and dispose used batteries in accordance with scrap lead acid battery program.
	Disconnect all floor drains connected to storm sewer system.
	Prohibit non-storm water discharges, e.g., dumping of used liquids down floor drains and washdown of maintenance areas.
	Provide employee training on appropriate storage and disposal of waste materials.
	Provide good housekeeping measures.
	Conduct inspections of work areas for compliance with BMPs.
Fueling	Use spill and overflow protection devices.
	Provide high level alarm on fuel storage tanks.
	Minimize/eliminate runoff onto fueling areas.
	Reduce exposure of fueling areas to precipitation by covering the fueling area.
	Provide dry adsorbents to clean up fuel spills.
	Conduct periodic inspections of fueling areas.
	Instruct personnel on proper fueling procedures.
	Provide curbing or posts around fuel pumps to prevent collisions during vehicle ingress and egress.
Vehicle and Equipment Washing	Avoid washing vehicles and equipment outdoors.
	Use biodegradable, phosphate free detergents.
	Recycle wash water.
	Provide vehicle wash rack with dedicated sediment trap.
	Use autoshut-off valves on washing equipment.
Outdoor vehicle parking and storage	Use drip pans under all equipment and vehicles waiting maintenance.
	Cover vehicle and equipment storage areas.
	Conduct inspections of storage and parking areas for leaks and filled drip pans.
	Provide employee training.
Vehicle and Equipment Painting (where applicable).	Keep paint and solvents away from traffic areas.
	Conduct sanding and painting in nonexposed areas, e.g., under cover, in accordance with OSHA standards.
	Cleanup accumulated particulate matter.
	Minimize overspraying parts.
	Dispose or recycle paint, solvents and thinner properly.
	Provide training to employees.
	Conduct periodic inspections of paint spraying areas.
Erosion and Sediment Control	Minimize runon from adjacent properties, e.g., diversion dikes, berms, or equivalent.
	Trap sediment at downgradient locations and outlets serving unstabilized areas. This may include filter fabric fences, gravel outlet protection, sediment traps, vegetated or riprap swales, vegetated strips, diversion structures, catch-basin filters, retention/detention basins or equivalent.
	Runoff containing oil and grease may include the use of absorbent booms or sand filters in front of outlet structures or other equivalent measures.
	Stabilize all high traffic areas, including all vehicle entrances and exit points.
	Conduct periodic sweeping of all traffic areas.
	Conduct inspections of BMPs.
	Perform preventative maintenance as needed on BMPs.
	Provide employee training on the proper installation and maintenance of erosion and sediment controls.

b. Waste Recycling Facilities (SIC 5093)—(recyclable liquid wastes). This section addresses source control measures, BMPs, and structural controls that are specifically applicable to waste recycling facilities (SIC 5093) which are engaged in such activities as reclaiming and recycling of liquid wastes such as spent solvents, used oil, and used antifreeze (ethylene glycol). Waste recycling facilities applying for coverage under Part XI.N. of today's proposed permit will be required to employ a comprehensive range of BMPs and source control measures to minimize contact of pollutants with storm water runoff and precipitation. In instances where facilities conduct certain operations indoors or under cover, a determination will be made by the owner/operator of the facility as to the applicability of these BMPs and source control measures to their particular facility. The following table summarizes the percent breakdown of BMPs that were reported by applicants participating in group application number 195.

TABLE N–15.—TYPES OF BMPS REPORTED IN EPA GROUP APPLICATION NUMBER 195

BMP	Percent of facilities
Secondary Containment (includes tanks, piping, and return/fill stations)	70
Containment Trench (includes closed loop containment trenches with sumps, sloped floors, and/or berms)	91
Roof (includes canvass tent roofs and enclosed structures)	7
Contingency Plan (serves as Spill Prevention and Countermeasures Control Plan)	100
Prevention and Preparedness Plan (includes inspection information and general housekeeping procedures)	100

The following table summarizes types of BMPs, and structural control options that are applicable to liquid waste recycling facilities.

TABLE N–16.—TYPES OF BMP OPTIONS APPLICABLE TO LIQUID WASTE RECYCLING FACILITIES

Activity	BMP alternatives
Individual Drum/Container Storage	Ensure container/drums are in good condition. Store waste materials in materially compatible drums. Use containers that meet National Fire Protection Association (NFPA) guidelines.
	Put individual containers on pallets. Limit stack height of individual containers/drums. Provide straps, plastic wrap, or equivalent around stacked containers to provided stability.
	Label/mark drums. Segregate hazardous and flammable wastes. Comply with NFPA guidelines for segregation of flammable wastes.
	Provide adequate clearance to allow material movement and access by material handling equipment.
	Provide semipermanent or permanent cover over wastes.
	Provide adequate clearance between stored materials to allow movement and handling.
	Establish clean up procedures, including the use of dry adsorbents, in the event of spills or leaks.
	Prohibit washing down of material storage areas. Disconnect or seal all floor drains from storm sewer system.
	Develop spill prevention, countermeasures and control (SPCC) procedures for all liquid container storage areas. Ensure employees are familiar with SPCC procedures. Schedule/conduct periodic employee training.
	Provide secondary containment, dikes, berms, containment trench, sumps, or other equivalent measure, in all storage areas.
Bulk Liquid Storage	Use welded pipe connections versus flange connections. Inspect all flange gaskets for deterioration.
	Apply corrosion inhibitors to exposed metal surfaces.
	Provide high level alarms for storage tanks.
	Provide redundant piping, valves, pumps, motors, as necessary, at all pumping stations. Provide manually activated shutoff valves in the event of spill. Install visible and/or audible alarms in the event of a spill.
	Install manually activated drainage values, or equivalent, versus flapper-type drain values. Provide adequate security against vandalism and tampering.
	Provide secondary containment around all bulk storage tanks, including berms, dikes, surface impoundments or equivalent. Ensure surfaces of secondary containment areas are adequately sealed to prevent leaks.
	Provide stationary boxes around all return and fill stations to eliminate/minimize hose drainage and minor waste transfer spills.
Waste Transfer Areas	Provide secondary containment or equivalent measures around all liquid waste transfer facilities.
	Provide cover over liquid waste transfer areas.
	Establish clean up procedures for minor spills including the use of dry adsorbents.
Inspections	Conduct inspections of all material storage, handling and transfer areas.
	Document signs of corrosion, worn parts or components on pumps and motors, leaking seals and gaskets.
	Conduct periodic nondestructive testing (NDT) of all bulk storage tanks for signs of deteriorating structural integrity.
Preventive Maintenance	Conduct periodic preventive maintenance of all structural controls, replace worn parts on components on valves, pumps, motors per manufacturer's recommendations.
Vehicle Maintenance (if applicable)	Establish an inventory of materials used in the maintenance shop that could become a potential pollutant source with storm water runoff, e.g., fuels, solvents, oils, lubricants.

TABLE N–16.—TYPES OF BMP OPTIONS APPLICABLE TO LIQUID WASTE RECYCLING FACILITIES—Continued

Activity	BMP alternatives
	Store and dispose of oily rags, filters (oil and air), batteries, engine coolant, transmission fluid, use oil, brake fluid, and solvents in a manner that minimizes potential contact with runoff and in compliance with State and Federal regulations.
	Label and track recycling of waste materials, e.g., batteries, solvent, used oil.
	Drain oil filters before disposal or recycling.
	Drain all fluids from all parts or components that will become scrap material or secondhand parts.
	Store liquid waste materials in compatible containers.
	Store and dispose used batteries in accordance with scrap lead acid battery program.
	Disconnect all floor drains connected to storm sewer system.
	Prohibit non-storm water discharges, e.g., dumping of used liquids down floor drains and washdown of maintenance areas.
	Provide employee training on appropriate storage and disposal of waste materials.
	Provide good housekeeping measures.
	Conduct inspections of work areas for compliance with BMPs.
Vehicle Cleaning (if applicable)	Avoid washing vehicles and equipment outdoors.
	Use biodegradable, phosphate free detergents.
	Recycle wash water.
	Provide vehicle wash rack with dedicated sediment trap.
	Use autoshut-off valves on washing equipment.
Training	Provide employee training on proper material handling and storage procedures. Require familiarization with applicable SPCC measures.

c. Recycling Facilities (SIC 5093). This section addresses best management practices that have been employed by one or more facilities within group applications 274, 647, 826, and 1145. The following table provides examples of BMPs used by the recycling facilities within this sub-section:

TABLE N–17.—Types of BMP Options Applicable to Recycling Facilities

Activity	BMP options and alternatives
Inbound Recyclable Materials Control	Provide public education brochures on acceptable recyclable materials.
	Educate curbside pick-up drivers on acceptable materials. Reject unacceptable materials at the source.
	Employee training.
	Provide totally-enclosed drop-off containers for public.
Indoor Storage	Store equivalent of the average daily volume of recyclable materials indoors.
	Provide good housekeeping.
	Disconnect all floor drains from storm sewer system.
	Prohibit illicit discharges and illegal dumping to floor drains that are connected to the storm sewer.
	Direct tipping floor washwaters to sanitary sewer system if permitted by local sanitary authority.
Recyclable Material Processing	Conduct processing operations indoors. Clean up residual fluids.
	Conduct routine preventive maintenance on all processing equipment.
	Schedule frequent good housekeeping to minimize particulate and residual materials buildup.
Outdoor Storage	Store only processed materials, i.e., baled plastic and aluminum and glass cullet.
	Provide containment pits with sumps pumps that discharge to sanitary sewer system. Prevent discharge of residual fluids to storm sewer.
	Provide dikes and curbs around bales of waste paper.
	Use tarpaulins or covers over bales of wastepaper.
	Conduct regularly scheduled sweeping of storage areas to minimize particulate buildup.
Residual Non-recyclable Materials	Store residual non-recyclable materials in covered containers for transport to a proper disposal facility.
	Bale residual non-recyclable materials and cover with tarpaulin or equivalent.
Vehicle Maintenance	Avoid washing equipment and vehicles outdoors.
	Eliminate outdoor maintenance areas.
Fueling	Establish spill prevention and clean-up procedures.
	Provide dry-absorbent materials or equivalent.
	Provide employee training, i.e., avoid topping off fuel tanks.
	Divert runoff from fueling areas.
Lubricant Storage	Eliminate or minimize outside storage.
	Provide employee training on proper, handling, storage.
	Divert runoff from storage areas.

4. Discharges Covered under this Section

The requirements listed under this section are applicable to storm water discharges from facilities typically identified in SIC 5093 (except for battery reclaimers and auto salvage yards). This includes facilities that are engaged in the processing, reclaiming and wholesale distribution of scrap and waste materials such as ferrous and nonferrous metals, paper, plastic,

cardboard, glass. For purposes of this permit, the term waste recycling facility applies to those facilities within SIC 5093 that receive a mixed wastestream of recyclable and non-recyclable wastes. Facilities that are engaged in reclaiming and recycling liquid wastes such as used oil, antifreeze, mineral spirits and industrial solvents and which are classified SIC 5093 are also covered under this section. The term recycling facility is used in this permit to those facilities that only receive source-separated recyclable materials primarily from non-industrial and residential sources, e.g., common consumer products including paper, newspaper, glass, cardboard, plastic containers, aluminum and tin cans.

5. Special Conditions

The following section identifies special conditions that are applicable to permittees applying for coverage under Part XI.N. of today's permit.

a. Prohibition of Non-storm Water Discharges. This section requires scrap and waste recycling facilities that are typically classified in SIC 5093 to certify that certain non-storm water discharges are not occurring at their facilities. A list of non-storm water discharges that are not authorized by this section has been identified. These discharges are prohibited due to the likelihood these discharges will contain substantial pollutant concentrations. The following non-storm water discharges are not authorized by this section: waste discharges to floor drains or sinks connected to the facilities storm sewer or storm drainage system; water originating from vehicle and equipment washing; steam cleaning wastewater; process wastewaters; washwater originating from cleaning tipping floor areas or material receiving areas that discharge to any portion of a storm sewer system; wastewater from wet scrubbers; boiler blowdown; noncontact and contact cooling water; discharges originating from dust control spray water; discharges from oil/water separators and sumps in the absence of a storm event; discharges originating from the cleaning out of oil/water separators or sumps; and non-storm water discharges from turnings containment areas.

The operators of non-storm water discharges must seek coverage for these discharges under a separate National Pollutant Discharge Elimination System (NPDES) permit if discharging to either a municipal separate storm sewer system or to waters of the United States. If such a permit has been issued, the plan shall identify the NPDES permit number and a copy of the NPDES permit shall be located at the facility and shall be readily accessible. If a permit application has been submitted for a non-storm water discharge, the plan shall be annotated accordingly and a copy of the application shall be located at the facility and shall be readily accessible.

For facilities that have prohibited discharges identified under this section and which discharge to a sanitary sewer system, the facility operator is required to take the appropriate notification actions as may be required by the operator of the sanitary sewer system. Any relevant documentation, i.e., notification letters and approvals, shall be kept with the plan. For facilities that have been issued an industrial user permit under the pretreatment program for discharges prohibited under this section, the plan shall identify the appropriate NPDES permit number and a copy of the permit shall be kept at the facility and shall be readily accessible. EPA strongly recommends that operators keep copies of relevant documentation concerning non-storm water discharges and NPDES permits with the plan.

6. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan. In addition to the supplemental information requirements identified in Part VI.C., scrap and waste recycling facilities in SIC 5093 are required to provide the additional information applicable to their industrial sector. The storm water pollution prevention plan is broken out into three subcategories; scrap recycling and waste recycling facilities (nonliquid materials); waste recycling facilities (liquid materials); and recycling facilities.

(1) Description of Potential Pollutant Sources

(a) Scrap Recycling and Waste Recycling Facilities (nonliquid recyclable wastes)—This section establishes that scrap recycling and waste recycling facilities shall provide the following information in their pollution prevention plan.

(i) Inbound Recyclable and Waste Material Control Program—The plan shall include a recyclable and waste material inspection program to minimize the likelihood of receiving non-recyclable materials (e.g., hazardous materials) that may be significant pollutant sources to storm water discharges. At a minimum, the plan shall address the following:

Information/education measures to encourage major suppliers of scrap and recyclable waste materials to drain residual fluids, whenever applicable, prior to its arrival at the facility. This includes vehicles and equipment engines, radiators, and transmissions, oil-filled transformers, white goods (appliances) and individual containers or drums;

Activities which accept scrap and materials that may contain residual fluids, e.g., automotive engines containing used oil, transmission fluids, etc., shall describe procedures to minimize the potential for these fluids from coming in contact with either precipitation or runoff. The description shall also identify measures or procedures to properly store, handle, dispose and/or recycle these residual fluids;

Procedures pertaining to the acceptance of scrap lead-acid batteries. Additional requirements for the handling, storage and disposal or recycling of batteries shall be in conformance with conditions for a scrap lead-acid battery program, see below;

A description of training requirements for those personnel engaged in the inspection and acceptance of inbound recyclable materials; and

Liquid wastes, including used oil, shall be stored in materially compatible and nonleaking containers and disposed or recycled in accordance with all requirements under the Resource Recovery and Conservation Act (RCRA), and other State or local requirements.

(ii) Scrap and Waste Material Stockpiles (outdoors)—The plan shall address areas where significant materials are exposed to either storm water runoff or precipitation. The plan must describe those measures and controls used to minimize contact of storm water runoff with stockpiled materials. The plan should include measures to minimize the extent of storm water contamination from these areas. The operator shall consider (within the plan) the use of the following BMPs (either individually or in combination) or their equivalent to minimize contact with storm water runoff:

Diversion devices or structures such as dikes, berms, containment trenches, culverts and/or surface grading;

Media filtration such as catch basin filters and sand filters;

Silt fencing; and,

Oil/water separators, sumps and dry adsorbents in stockpile areas that are potential sources of residual fluids, e.g., automotive engine storage areas.

The operator may consider the use of permanent or semipermanent covers, or other similar forms of protection over stockpiled materials where the operator determines that such measures are reasonable and appropriate.

The operator may consider the use of sediment traps, vegetated swales and/or vegetated strips to facilitate settling or filtering out of pollutants and sediment.

(iii) Stockpiling of Turnings Previously Exposed to Cutting Fluids (outdoors)—The plan shall address all areas where stockpiling of industrial turnings (previously exposed to cutting fluids) occurs. The plan shall implement those measures necessary to minimize contact of surface runoff with residual cutting fluids. The operator shall consider implementation of either of the following two alternatives or a combination of both or equivalent measures:

Alternative 1: Storage of all turnings previously exposed to cutting fluids under some form of permanent or semi-permanent cover. Discharges of residual fluids from these areas to the storm sewer system in the absence of a storm event is prohibited. Discharges to the storm sewer system as a consequence of a storm event is permitted provided the discharge is first directed through an oil/water separator or its equivalent. Procedures to collect, handle, and dispose or recycle residual fluids that may be present shall be identified in the plan.

Alternative 2: Establish dedicated containment areas for all turnings that have been exposed to cutting fluids where runoff from these areas is directed to a storm sewer system, providing the following:

Containment areas constructed of either concrete, asphalt or other equivalent type of impermeable material;

A perimeter around containment areas to prevent runoff from moving across these areas. This would include the use of shallow berms, curbing, or constructing an elevated pad or other equivalent measure;

A suitable drainage collection system to collect all runoff generated from within containment areas. At a minimum, the drainage system shall include a plate-type oil/water separator or its equivalent. The oil/water separator or its equivalent shall be installed according to the manufacturer's recommended specifications, whenever available, specifications will be kept with the plan;

A schedule to maintain the oil/water separator (or its equivalent) to prevent the accumulation of appreciable amounts of fluids. In the absence of a storm event, no discharge from containment areas to the storm sewer system are permitted unless the discharge is covered by a separate NPDES permit; and

Identify procedures for the proper disposal or recycling of collected residual fluids.

(iv) Scrap and Waste Material Stockpiles (covered or indoors)—The plan shall address, at a minimum, measures and controls to minimize and, whenever feasible, eliminate residual liquids and particulate matter from materials stored indoors from coming in contact with surface runoff. The operator shall consider including in their plan: good housekeeping measures to collect residual liquids from aluminum, glass and plastic containers and prohibiting the practice of allowing washwater from tipping floors or other indoor processing areas from discharging to a storm sewer system, inspections to ensure that material stockpile areas with existing floor drains are not connected to the storm sewer system or any portion of the storm sewer system, and the disconnection of any floor drains to the storm drainage system.

(v) Scrap and Recyclable Waste Processing Areas—The plan shall address areas where scrap and recyclable waste processing equipment are sited. This includes measures and controls to minimize surface runoff from coming in contact with scrap processing equipment. In the case of processing equipment that generate visible amounts of particulate residue, e.g., shredding facilities, the plan shall describe good housekeeping and preventive maintenance measures to minimize contact of runoff with residual fluids and accumulated particulate matter. At a minimum, the operator shall consider including the following:

A schedule of periodic inspections of equipment for leaks, spills, malfunctioning, worn or corroded parts or equipment; preventive maintenance program to repair and/or maintain processing equipment; measures to minimize shredder fluff from coming in contact with surface runoff; use of dry-absorbents or other cleanup practices to collect and to dispose or recycle spilled or leaking fluids; and installation of low-level alarms or other equivalent protection devices on unattended hydraulic reservoirs over 150 gallons in capacity. Alternatively, provide secondary containment with sufficient volume to contain the entire volume of the reservoir.

The operator shall consider using the following types of BMPs:

(a) Diversion structures such as dikes, berms, culverts, containment trenches, elevated concrete pads, grading to minimize contact of storm water runoff with outdoor processing equipment;

(b) Oil/water separators or sumps in processing areas that are potential sources of residual fluids and grease;

(c) Permanent or semipermanent covers, or other similar measures;

(d) Retention and detention basins or ponds, sediment traps or vegetated swales and strips, to facilitate settling or filtering out of pollutants in runoff from processing areas; or

(e) Media filtration such as catch basin filters and sand filters.

(vi) Scrap Lead-acid Battery Program—The plan shall address measures and controls for the proper receipt, handling, storage and disposition of scrap lead-acid batteries (battery reclaiming is not eligible for coverage under this permit). The operator shall consider including: procedures for accepting scrap batteries and describing how they will be segregated from other scrap materials; procedures for managing battery casings that may be cracked or leaking, including the proper handling and disposal of residual fluids; measures to minimize and, whenever possible, eliminate exposure of scrap batteries to either runoff or precipitation; the schedule for conducting periodic inspections of scrap battery storage areas and applicable source control measures; and measures to provide employee training on the management of scrap batteries.

(vii) Erosion and Sediment Control—The plan shall identify all areas associated with industrial activity that have a high potential for soil erosion and suspended solids loadings, i.e., areas that tend to accumulate significant particulate matter. Appropriate source control, stabilization measures, nonstructural, structural controls, or an equivalent shall be provided in these areas. The plan shall also contain a narrative discussion of the reason(s) for selected erosion and sediment controls. At a minimum, the operator shall consider in the plan, either individually or in combination, the following erosion and sediment control measures:

Filtering or diversion practices, such as filter fabric, sediment filter boom, earthen or gravel berms, curbing or other equivalent measure;

Catch basin filters, filter fabric, or equivalent measure, placed in or around inlets or catch basins that receive runoff from scrap and waste storage areas, and processing equipment; and

Sediment traps, vegetative buffer strips, or equivalent, that effectively trap or remove sediment prior to discharge through an inlet or catch basin.

In instances where significant erosion and suspended solids loadings continue after implementation of source control

measures and nonstructural controls, the operator shall consider providing in the plan for a detention or retention basin or other equivalent structural control. All structural controls shall be designed using good engineering practice. All structural controls and outlets that are likely to receive discharges containing oil and grease must include appropriate measures to minimize the discharge of oil and grease through the outlet. This may include the use of an absorbent boom or other equivalent measure.

Where space limitations (e.g., obstructions caused by permanent structures such as buildings and permanently-sited processing equipment and limitations caused by a restrictive property boundary) prevent the siting of a structural control, i.e., retention basin, such a determination will be noted in the plan. The operator will identify in the plan what existing practices shall be modified or additional measures shall be undertaken to minimize erosion and suspended sediment loadings in lieu of a structural BMP.

(viii) Spill Prevention and Response Procedures—To prevent or minimize storm water contamination at loading and unloading areas, and from equipment or container failures, the operator shall consider including in the plan the following practices:

Description of spill prevention and response measures to address areas that are potential sources of leaks or spills of fluids;

All significant leaks and spills should be contained and cleaned up as soon as possible. If malfunctioning equipment is responsible for the spill or leak, repairs should also be conducted as soon as possible;

Cleanup procedures should be identified in the plan, including the use of dry absorbent materials or other cleanup methods. Where dry absorbent cleanup methods are used, an adequate supply of dry absorbent material should be maintained onsite. Used absorbent material should be disposed of properly;

Drums containing liquids, including oil and lubricants, should be stored indoors; or in a bermed area; or in overpack containers or spill pallets; or in similar containment devices;

Overfill prevention devices should be installed on all fuel pumps or tanks;

Drip pans or equivalent measures should be placed under any leaking piece of stationary equipment until the leak is repaired. The drip pans should be inspected for leaks and checked for potential overflow, and be emptied regularly to prevent overflow and all liquids will be disposed of in accordance with all requirements under RCRA; and

An alarm and/or pump shut off system should be installed and maintained on all outside equipment with hydraulic reservoirs exceeding 150 gallons (only those reservoirs not directly visible by the operator of the equipment) in order to prevent draining the tank contents in the event of a line break. Alternatively, the equipment may have a secondary containment system capable of containing the contents of the hydraulic reservoir plus adequate freeboard for precipitation. Leaking hydraulic fluids should be disposed of in accordance with all requirements under RCRA.

(ix) Quarterly Inspections—A quarterly inspection shall include all designated areas of the facility and equipment identified in the plan. The inspection shall include a means of tracking and conducting follow up actions based on the results of the inspection. The inspections shall be conducted by members of the Storm Water Pollution Prevention team. At a minimum, quarterly inspections shall include the following areas:

All outdoor scrap processing areas;

All material unloading and loading areas (including rail sidings) that are exposed to either precipitation or storm water runoff;

Areas where structural BMPs have been installed;

All erosion and sediment BMPs;

Outdoor vehicle and equipment maintenance areas;

Vehicle and equipment fueling areas; and

All areas where waste is generated, received, stored, treated, or disposed and which are exposed to either precipitation or storm water runoff.

If exposed to precipitation or storm water runoff, the inspection shall attempt to identify any corroded or leaking containers, corroded or leaking pipes, leaking or improperly closed valves and valve fittings, leaking pumps and/or hose connections, and deterioration in diversionary or containment structures. Spills or leaks shall be immediately addressed according to the facilities. A record of inspections shall be maintained with the plan.

The BMPs identified above have been employed by scrap recycling and waste recycling facilities are believed to be appropriate given the types of pollutants found in storm water discharges from these facilities. In addition, the diversity of options allows permittees to select those BMPs that are most applicable to the extent of the risk that exists at a particular facility. In instances where nonstructural measures are not sufficient, the conditions direct the permittee to more stringent requirements such as structural controls.

(b) Waste Recycling Facilities (Recyclable liquid wastes)—This section establishes that waste recycling facilities (recyclable liquid wastes) shall provide the following information.

(i) Waste Material Storage (indoors)—The operator shall consider including in the plan measures and controls to minimize residual liquids from waste materials stored indoors from coming in contact with surface runoff and provisions to maintain a sufficient supply of dry-absorbent materials or a wet vacuum system or other equivalent measure to promptly respond to minor leaks or spills. Measures for secondary containment or its equivalent and procedures for proper material handling (including labeling and marking) and storage of containerized materials should be considered. Drainage from bermed areas should be discharged to an appropriate treatment facility or sanitary sewer system. Discharges from bermed areas should be covered by a separate NPDES permit or industrial user permit under the pretreatment program. The drainage system, where applicable, should include appropriate appurtenances such as pumps or ejectors and manually-operated valves of the open-and-close design.

(ii) Waste Material Storage (outdoors)—The plan will address areas where waste materials are exposed to either storm water runoff or precipitation. The plan must include measures to provide appropriate containment, drainage control and/or other appropriate diversionary structures. The plan must describe those measures and controls used to minimize contact of storm water runoff with stored materials. The operator shall consider including in the plan the following preventative measures or an equivalent:

An appropriate containment structure such as dikes, berms, curbing or pits, or other equivalent measure. The containment should be sufficient to store the volume of the largest single tank and should include sufficient freeboard for precipitation;

A sufficient supply of dry-absorbent materials or a wet vacuum system to collect liquids from minor spills and leaks in contained areas; and

Discharges of precipitation from containment areas containing used oil shall be in accordance with applicable sections of 40 CFR Part 112.

(iii) Truck and Rail Car Waste Transfer Areas—The plan will describe

measures and controls for truck and rail car loading and unloading areas. This includes appropriate containment and diversionary structures to minimize contact with precipitation and/or storm water runoff. The plan will also address measures to clean up minor spills and/or leaks originating from the transfer of liquid wastes. This may include dry-clean up methods, roof coverings, and other runoff controls.

(iv) Erosion and Sediment Control—The plan shall identify all areas associated with industrial activity that have a high potential for soil erosion. Appropriate stabilization measures, nonstructural and structural controls shall be provided in these areas. The plan shall contain a narrative consideration of the appropriateness for selected erosion and sediment controls. Where applicable, the facility shall consider the use of the following types of preventive measures: sediment traps; vegetative buffer strips; filter fabric fence; sediment filtering boom; gravel outlet protection; or other equivalent measures that effectively trap or remove sediment prior to discharge through an inlet or catch basin.

(v) Spill Prevention and Response Procedures—The plan will address measures and procedures to address potential spill scenarios that could occur at the facility. This includes all applicable handling and storage procedures, containment, diversion controls and clean-up procedures. The plan will specifically address all outdoor and indoor storage areas, waste transfer areas, material receiving areas (loading and unloading), and waste disposal areas.

(vi) Quarterly Inspections—Quarterly visual inspections shall be conducted by a member, or members, of the storm water pollution prevention team. The quarterly inspection shall include all designated areas of the facility and equipment identified in the plan. The inspection shall include a means of tracking and conducting follow up actions based on the results of the inspection. At a minimum, the inspections shall include the following areas:

Material storage areas;

Material unloading and loading areas (including rail sidings) that are exposed to either precipitation or storm water runoff;

Areas where structural BMPs have been installed;

All erosion and sediment BMPs;

Outdoor vehicle and equipment maintenance areas (if applicable);

Vehicle and equipment fueling areas (if applicable); and

All areas where waste is generated, received, stored, treated, or disposed and which are exposed to either precipitation or storm water runoff.

If exposed to precipitation or storm water runoff, the inspection shall identify the presence of any corroded or leaking containers, corroded or leaking pipes, leaking or improperly closed valves and valve fittings, leaking pumps and/or hose connections, and deterioration in diversionary or containment structures. Spills or leaks shall be immediately addressed according to the facility's spill prevention and response procedures.

(c) Recycling Facilities.—This section establishes that recycling facilities (including MRFs) that receive only source-separated recyclable materials primarily from non-industrial and residential sources shall provide the following information in their pollution prevention plan.

(i) Inbound Recyclable Material Control Program. The plan shall include a recyclable material inspection program to minimize the likelihood of receiving non-recyclable materials (e.g., hazardous materials) that may be significant source of pollutants in surface runoff. At a minimum, the operator shall consider addressing in the plan the following:

A description of information and education measures to educate the appropriate suppliers of recyclable materials on the types of recyclable materials that are acceptable and those that are not acceptable, e.g., household hazardous wastes;

A description of training requirements for drivers responsible for pickup of recyclable materials;

Clearly mark public drop-off containers as to what materials can be accepted;

Rejecting non-recyclable wastes or household hazardous wastes at the source; and

A description of procedures for the handling and disposal of nonrecyclable materials.

(ii) Outdoor Storage. The plan shall include BMPs to minimize or reduce the exposure of recyclable materials to surface runoff and precipitation. The plan, at a minimum, shall include good housekeeping measures to prevent the accumulation of visible quantities of residual particulate matter and fluids, particularly in high traffic areas. The plan shall consider tarpaulins or their equivalent to be used to cover exposed bales of recyclable waste paper. The operator shall consider within the plan the use of the following types of BMPs (individually or in combination) or their equivalent:

Provide totally-enclosed drop-off containers for public.

Provide a sump and sump pump with each containment pit. Prevent the discharge of residual fluids to storm sewer system. Prevent discharging to the storm sewer system;

Provide dikes and curbs around bales of recyclable waste paper;

Divert surface runoff away from outside material storage areas;

Provide covers over containment bins, dumpsters, roll-off boxes; and,

Store the equivalent one day's volume of recyclable materials indoors.

(iii) Indoor Storage and Material Processing. The plan shall address BMPs to minimize the release of pollutants from indoor storage and processing areas to the storm sewer system. The plan shall establish specific measures to ensure that all floor drains do not discharge to the storm sewer system. The following BMPs shall be considered for inclusion in the plan:

Schedule routine good housekeeping measures for all storage and processing areas;

Prohibit the practice of allowing tipping floor washwaters from draining to any portion of a storm sewer system;

Provide employee training on pollution prevention practices;

(iv) Vehicle and Equipment Maintenance. The plan shall also provide for BMPs in those areas where vehicle and equipment maintenance is occurring outdoors. At a minimum, the following BMPs shall be considered for inclusion in the plan:

Prohibit vehicle and equipment washwater from discharging to the storm sewer system;

Minimize or eliminate outdoor maintenance areas, wherever possible;

Establish spill prevention and clean-up procedures in fueling areas;

Provide employee training on avoiding topping off fuel tanks;

Divert runoff from fueling areas;

Store lubricants and hydraulic fluids indoors;

Provide employee training on proper, handling, storage of hydraulic fluids and lubricants.

Monitoring and Reporting Requirements

Analytical Monitoring Requirements. EPA believes that scrap recycling and waste recycling facilities (nonsource-separated facilities only) may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention

plan and to characterize the discharge for potential environmental impacts, the permit requires scrap recycling and waste recycling facilities to collect and analyze samples of their storm water discharges for the pollutants listed in Table N–18. The pollutants listed in Table N–18 were found to be above benchmark levels for a significant portion of scrap and waste recycling facilities that submitted quantitative data in the group application process, or are believed to be present based upon the description of industrial activities and significant materials exposed. Because these pollutants have been reported above benchmark levels , EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

At a minimum, storm water discharges from scrap recycling and waste recycling facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table N–18. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE N–18.—INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern [1]	Cut-off concentration
Chemical Oxygen Demand (COD).	120 mg/L
Total Suspended Solids (TSS).	100 mg/L
Total Recoverable Aluminum.	0.75 mg/L
Total Recoverable Copper.	0.0636 mg/L
Total Recoverable Iron ...	1.0 mg/L
Total Recoverable Lead .	0.0816 mg/L
Total Recoverable Zinc ...	0.065 mg/L

[1] Several congeners of PCBs (PCB–1016, –1221, –1242, –1248, –1260) were above established benchmarks, however, EPA believes that these constituents will readily bound up with sediment and particulate matter. Therefore, EPA feels that monitoring for TSS will serve as an adequate indicator for the control of PCBs.

If the average concentration for a parameter is less than or equal to the value listed in Table N–18, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table N–18, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit.

TABLE N–19.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table N–18, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table N–18, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table N–18. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has proposed monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring reports required, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA in the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring

reports required under paragraph (c) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum quarterly requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of storm water discharges from each outfall are required. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples. The examination must be conducted at least once in each of the following periods: January through March; April through June; July through September; and October through December.

The examination must be made at least once in each quarter of the permit during daylight unless there is insufficient rainfall or snow-melt to generate runoff. Where practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and effects on the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation on-site with the records of the visual examination. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

g. Retention of Records

(1) The permittee shall retain records of all inspections and monitoring information, including certification reports, noncompliance reports, calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports, and supporting data, requested by the permitting authority for at least 3 years after the date of the sampling event or inspection.

O. Storm Water Discharges Associated With Industrial Activity From Steam Electric Power Generating Facilities, Including Coal Handling Areas

1. Industrial Profile

The conditions in this section apply to storm water discharges from steam electric power generating facilities. The steam electric power generating category

includes facilities which are coal, oil, gas, or nuclear fired. Heat captured co-generation facilities are not covered under the definition of storm water discharge associated with industrial activity, however, dual fuel co-generation facilities are included in the definition. When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Storm water discharges from coal piles are eligible for coverage under this permit, where these discharges are not already subject to an existing NPDES permit.

The production of electrical energy always involves the conversion of some other form of energy. The two most important sources of energy which are converted to steam electric energy are the chemical energy of fossil fuels and the atomic energy of nuclear fuels. Current uses of fossil fuels are based on a combustion process, followed by steam generation to convert the heat first into mechanical energy and then to convert the mechanical energy into electrical energy. Nuclear power plants utilize a cycle similar to that used in fossil fueled power plants except that the source of heat is atomic interactions rather than the combustion of fossil fuel.

The steam electric power generating process for fossil fuel systems are typically enclosed and subject to effluent limitations guidelines [40 Code of Federal Regulations (CFR) Part 423], as is coal pile runoff. However, the unloading and transport of coal within the facility is subject to the conditions set forth in this section of today's permit. Likewise, the unloading and storage areas for liquid fuels and chemicals are subject to the conditions in this section of today's permit.

Industrial activities occurring at steam electric power generating facilities that pertain to the storm water rule include, "* * * but [are] not limited to, storm water discharges from industrial plant yards; material handling sites; refuse sites; sites used for the application or disposal of process wastewaters (as defined at 40 CFR Part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished materials; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water" (40 CFR 122.26(b)(14)). Common industrial activities at steam electric power generating facilities include the unloading, transport, and storage of raw materials, and the disposal of waste materials.

Significant materials include, "* * * but [are] not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; * * * hazardous substances designated under Section 101(14) of CERCLA; any chemical facilities required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges" (40 CFR 122.26(b)(12)). Significant materials commonly found at steam electric power generating facilities include: coal; diesel fuel; and waste materials.

Historically, steam electric power generating facilities were categorized in accordance with the type of fuel they burned. Recently, however, steam electric power generating facilities have modified their equipment to enable them to use more than one fuel. Presented below are brief descriptions of the industrial activities and significant materials associated with the production of steam electric power. Due to the increase in facilities burning multiple fuels the industrial activities and significant materials are discussed together. However, the industrial activities and significant materials for nuclear powered facilities are discussed separately. Unique practices are noted.

a. Industrial Activities: Fossil Fuel Powered Plants. Steam electric power generation can be divided into four stages. In the first operation, fossil fuel (coal, oil, or natural gas) is burned in a boiler furnace. The evolving heat is used to produce pressurized and superheated steam. This steam is conveyed to the second stage, the turbine, where it gives energy to the rotating blades and, in the process, loses pressure and increases in volume. The rotating blades of the turbine act to drive an electric generator or alternator to convert the imparted mechanical energy into electrical energy. The steam leaving the turbine enters the third state, the condenser, where it is condensed to water. The liberated heat is transferred to a cooling medium which is normally water. Finally, the condensed steam is reintroduced into the boiler by a pump to complete the cycle.

Features unique to coal-fired plants include coal storage and preparation (transport, beneficiation, pulverization, drying), coal-fired boiler, ash handling and disposal systems, and flue gas cleaning, and desulfurization.

b. Significant Materials: Fossil Fuel Powered Plants. The type of fuel (coal, oil, gas, nuclear) used to fire power plant boilers most directly influences the number of waste streams. The influence comes principally from the effect of fuel on the volume of ash generated. Stations using heavy or residual oils generate fly ash in large quantities and may generate some bottom ash. Stations which burn coal create both fly ash and bottom ash. Bottom ash is the residue which accumulates on the furnace bottom, and fly ash is the lighter material which is carried over in the flue gas stream.

c. Industrial Activities: Nuclear Powered Plants. Nuclear power plants utilize a cycle similar to that used in fossil fueled power plants except that the source of heat is atomic interactions rather than the combustion of fossil fuel. Water serves as both moderator and coolant as it passes through the nuclear reactor core. In a pressurized water reactor, the heated water then passes through a separate heat exchanger where steam is produced on the secondary side. This steam, which contains radioactive materials, drives the turbines. In a boiling water reactor, steam is generated directly in the reactor core and is then piped directly to the turbine. This arrangement produces some radioactivity in the steam and therefore requires some shielding of the turbine and condenser.

d. Significant Materials: Nuclear Powered Plants. Few if any significant materials are exposed to storm water at nuclear powered steam electric facilities. Materials that are potentially exposed do not involve steam electric generating equipment, raw materials, or waste products. The materials that are exposed to storm water are office wastes and ground maintenance equipment and tools.

2. Pollutants in Storm Water Discharges Associated With Steam Electric Power Generating Facilities

Steam electric generating facilities are subject to effluent limitations guidelines that limit the number and variety of

industrial activities that are included in the storm water program. Pollutants may be present in storm water as a result of outdoor activities associated with steam electric power generating facilities such as: material handling and transport operations; waste disposal; and deposition of airborne particulate matter. In addition, sources of pollutants other than storm water, such as illicit connections,[92] spills, and other improperly dumped materials, may increase the pollutant loadings discharged into waters of the United States.

Many of the part 2 group application data submittals did not identify individual site characteristics or sources of storm water pollutants which may be responsible for pollutant loadings. In addition, because the industry has been moving toward combined fuel generating facilities, the part 2 sampling data was reviewed in the aggregate.

Table O–1 lists potential pollutant source activities and related pollutants associated with steam electric power generating facilities. The primary and largest potential source of storm water pollutants from fossil-fueled steam electric generating facilities is ash refuse piles.

TABLE O–1.—INDUSTRIAL ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS FOR STEAM ELECTRIC POWER GENERATING FACILITIES

Activity	Pollutant source	Pollutant
Above Ground Liquid Storage Tank.	External corrosion and structural failure	Fuel, oil, heavy metals, ammonia, chlorine, sulfuric acid, sodium hydroxide, and other materials being stored.
	Installation problems	Fuel, oil, heavy metals, ammonia, chlorine, sulfuric acid, sodium hydroxide, and other materials being stored.
	Spills due to operator error	Fuel, oil, heavy metals, ammonia, chlorine, sulfuric acid, sodium hydroxide, and other materials being stored.
	Failure of piping systems	Fuel, oil, heavy metals, ammonia, chlorine, sulfuric acid, sodium hydroxide, and other materials being stored.
	Leaks or spills during pumping of liquids from barges, trucks, rail cars to a storage facility.	Fuel, oil, heavy metals, ammonia, chlorine, sulfuric acid, sodium hydroxide, and other materials being stored.
Vehicle and Equipment Maintenance.	Parts cleaning	Oil, heavy metals, chlorinated solvents, acid/alkaline wastes, ethylene glycol.
	Spills of oil, degreasers, hydraulic fluids, transmission fluid, radiator fluids.	Oil, arsenic, heavy metals, organics, chlorinated solvents, ethylene glycol.
	Fluids replacement	Oil, arsenic, heavy metals, organics, fuel.
Fueling Operations	Spills & leaks during fuel delivery	Fuel, oil, heavy metals.
	Spills caused by "topping off" fuel tanks	Fuel, oil, heavy metals.
	Leaking storage tanks	Fuel, oil, heavy metals.
	Allowing rainfall on the fuel area or storm water to run onto the fuel area.	Fuel, oil, heavy metals.
Coal Handling Areas	Fugitive dust emissions from coal handling	Suspended solids, copper, iron, aluminum, nickel, and trace metals.
	Spills during delivery	Suspended solids, copper, iron, aluminum, nickel, and trace metals.
	Offsite tracking of coal dust	Suspended solids, copper, iron, aluminum, nickel, and trace metals.
Ash Handling Areas, Ash Landfills.	Spills during transfer of ash to landfills	Suspended solids, chromium, copper, iron, zinc, oil and grease, aluminum.
	Offsite tracking of ash	Suspended solids, chromium, copper, iron, zinc, oil and grease, aluminum.
Scrapyards, Refuse Sites	Discarded material	Fuel, oils, heavy metals.

The ash composition from oil, on a weight percent basis, is much lower than that of coal. Oil ash rarely exceeds 0.3 percent of the input oil whereas coal ash comprises from 3 to 30 percent of the coal. In general, the ash content increases with increasing asphaltic constituents in which the sulfur acts largely as a bridge between aromatic rings.

The many elements which may appear in oil ash deposits include vanadium, sodium, and sulfur. Compounds containing these elements are found in almost every deposit in boilers fired by residual fuel oil and often constitute the major portion of these deposits. Oil ash, especially from plants using Venezuelan and certain Middle Eastern oil can contain significant amounts of nickel.

Some of the ash-forming constituents in the crude oil had their origin in animal and vegetable matter from which the oil was derived. The remainder is extraneous material resulting from contact of the crude oil with rock structures and salt brines or picked up during refining processes, storage, and transportation. Vanadium, iron, sodium, nickel, and calcium in fuel oil are common in rock strata, but elements including vanadium, nickel, zinc, and copper are believed to come from organic matter from which the petroleum was created.

[92] Illicit connections are contributions of unpermitted non-storm water discharges to storm sewers from any of a number of sources including sanitary sewers, industrial facilities, commercial establishments, or residential dwellings. The probability of illicit connections at steam electric facilities is low yet it still may be applicable at some operations.

The ash residue resulting from the combustion of coal is primarily derived from the inorganic matter in the coal. The chemical composition of dry bottom ash and fly ash are quite similar. The major constituents present in coal ash are silica, alumina, ferric oxide, calcium oxide, magnesium oxide, and minor amounts of sodium and potassium oxides. Other parameters which may be present include sulfur trioxide, carbon, boron, phosphorus, uranium, and thorium. The concentration differences can vary considerably from one site to another.[93]

When conducting their data analysis for their 1980 Development Document, the U.S. Environmental Protection Agency (EPA) found that there was no correlation between arsenic, nickel, zinc, copper, and selenium and total suspended solids, whenever their value was 30 mg/L or less.[94]

The quality of storm water runoff from coal handling areas is dependent on pH, as pH influences the release of toxic and heavy metals. Suspended solids levels result when storm water suspends coal particulates. Most of the total dissolved solids concentrations are a consequence of enhanced pyritic oxidation.

Storm water runoff from exposed sources of coal tends to be of an acid nature, primarily as a result of the oxidation of iron sulfide in the presence of oxygen and water.[95] The presence of certain acidophilic, chemoautotrophic bacteria, and a pH of 2.0 to 4.5 generally indicates storm water runoff high in iron, manganese, and total dissolved solids.[96]

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at steam electric power generating facilities as a whole and not subdivide this sector. Therefore, Table O–2 lists data for selected parameters from facilities in the steam electric power generating sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F, as well as the pollutants that EPA has determined may merit further monitoring.

TABLE O–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY STEAM ELECTRIC GENERATING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample type	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	29	33	78	80	5.8	5.7	0.0	0.0	45.0	37.0	4.3	4.0	20.3	16.8	38.4	29.5
COD	30	33	78	79	102.5	68.7	0.0	0.0	1410.0	540.0	32.5	39.0	332.8	188.3	739.8	333.6
Nitrate + Nitrite Nitrogen	30	33	78	79	5.47	0.73	0.00	0.00	350.00	3.90	0.36	0.41	4.34	2.41	11.17	4.66
Total Kjeldahl Nitrogen	30	33	78	80	2.36	1.90	0.00	0.00	22.30	19.1	1.20	0.99	7.35	5.37	14.95	10.26
Oil & Grease	34	N/A	90	N/A	1.4	N/A	0.0	N/A	20.0	N/A	0.0	N/A	7.3	N/A	19.5	N/A
pH	30	N/A	72	N/A	N/A	N/A	3.8	N/A	9.0	N/A	7.4	N/A	8.9	N/A	9.7	N/A
Total Phosphorus	30	33	77	80	0.81	0.65	0.00	0.00	6.00	7.20	0.30	0.28	3.56	2.62	9.27	6.45
Total Suspended Solids	30	33	78	79	504	208	0	0	22790	5554	44	40	1561	967	6077	3292
Iron, Total	29	32	67	73	7.0	6.3	0.0	0.0	67.0	191.0	1.8	1.4	34.7	19.9	117.0	58.1
Zinc, Total	14	17	33	38	0.300	0.250	0.000	0.000	5.500	4.200	0.07	0.08	1.164	0.725	3.389	1.607

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Pollutant Control Measures Required Under Other EPA Programs.

The Agency recognizes that other EPA programs address pollution prevention at steam electric power generating facilities. The Oil Pollution Prevention Program (40 CFR Part 112) has established procedures to prevent the discharge of oil from nontransportation related onshore and offshore facilities. This program requires owners or operators of onshore and offshore facilities to prepare a Spill Prevention Control and Countermeasure Plan (SPCC Plan) for their facility if they could reasonably be expected to discharge oil, into or upon the navigable waters of the United States or adjoining shorelines, in quantities that violate applicable water quality standards, or cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. Guidelines for the preparation and implementation of a Spill Prevention Control and Countermeasure Plan can be found at 40 CFR 112.7.

Under the Resource Conservation and Recovery Act (RCRA) specific requirements have been established which address generators of hazardous wastes. Regulations have been developed which address the accumulation of hazardous waste onsite prior to transport to a hazardous waste disposal facility. These regulations address proper storage of hazardous wastes, emergency planning, and training personnel in proper handling procedures for hazardous wastes.

4. Storm Water Pollution Prevention Plan Requirements

The conditions that apply to steam electric power generating facilities are based on the requirements set forth in the common permit conditions for storm water discharges from industrial activities discussed in today's fact sheet. The discussion that follows only addresses conditions that differ from those common conditions. There are no additional pollution prevention requirements beyond the common conditions for nuclear powered steam electric generating facilities.

a. Description of Pollutant Sources. Under the description of pollutant sources in the storm water pollution prevention plan requirements, permittees are required to include a site map of the facility. The areas required to be identified on the site map now also include the following: landfills,

[93] EPA. Effluent Guidelines Division. "Development Document for Effluent Limitations Guidelines and Standards for the Steam Electric Point Source Category." September 1980. (EPA 440/1–80/029–b). Page 131.

[94] EPA. Effluent Guidelines Division. "Development Document for Effluent Limitations Guidelines and Standards for the Steam Electric Point Source Category." September 1980. (EPA 440/1–80/029–b). Page 138.

[95] EPA. Effluent Guidelines Division. "Development Document for Effluent Limitations Guidelines and Standards for the Steam Electric Point Source Category." September 1980. (EPA 440/1–80/029–b). Page 138.

[96] EPA. Effluent Guidelines Division. "Development Document for Effluent Limitations Guidelines and Standards for the Steam Electric Point Source Category." September 1980. (EPA 440/1–80/029–b). Page 138.

treatment ponds, scrap yards, general refuse areas, locations of short and long term storage of general materials, and the location of stock pile areas. EPA believes this is appropriate since these areas may potentially be significant sources of pollutants to storm water. In addition, the site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g., storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

b. Measures and Controls. Under the description of measures and controls in the storm water pollution prevention plan requirements, this section requires that all areas that may contribute pollutants to storm water discharges shall be maintained in a clean, orderly manner. This section also requires that the following 15 areas must be specifically addressed:

(1) Fugitive Dust Emissions. The plan must describe measures that prevent or minimize fugitive dust emissions from coal handling areas. The permittee shall consider establishing procedures to minimize offsite tracking of coal dust. To prevent offsite tracking the facility may consider specially designed tires, or washing vehicles in a designated area before they leave the site, and controlling the wash water.

(2) Delivery Vehicles. The plan must describe measures that prevent or minimize contamination of storm water runoff from delivery vehicles arriving on the plant site. At a minimum the permittee should consider the following:

(a) Develop procedures for the inspection of delivery vehicles arriving on the plant site, and ensure overall integrity of the body or container.

(b) Develop procedures to control leakage or spillage from vehicles or containers, and ensure that proper protective measures are available for personnel and environment.

(3) Fuel Oil Unloading Areas. The plan must describe measures that prevent or minimize contamination of storm water runoff from fuel oil unloading areas. At a minimum the facility operator must consider using the following measures or an equivalent:

(a) Use containment curbs in unloading areas.

(b) During deliveries station personnel familiar with spill prevention and response procedures must be present to ensure that any leaks or spills are immediately contained and cleaned up.

(c) Use spill and overflow protection (drip pans, drip diapers, and/or other containment devices shall be placed beneath fuel oil connectors to contain any spillage that may occur during deliveries or due to leaks at such connectors).

(4) Chemical Loading/Unloading Areas. The plan must describe measures that prevent or minimize the contamination of storm water runoff from chemical loading/unloading areas. At a minimum the permittee must consider using the following measures or an equivalent:

(a) Use containment curbs at chemical loading/unloading areas to contain spills.

(b) During deliveries station personnel familiar with spill prevention and response procedures must be present to ensure that any leaks or spills are immediately contained and cleaned up.

Where practicable chemical loading/unloading areas should be covered, and chemicals should be stored indoors.

(5) Miscellaneous Loading/Unloading Areas. The plan must describe measures that prevent or minimize the contamination of storm water runoff from loading and unloading areas. The facility may consider covering the loading area, minimizing storm water runon to the loading area by grading, berming, or curbing the area around the loading area to direct storm water away from the area, or locate the loading/unloading equipment and vehicles so that leaks can be controlled in existing containment and flow diversion systems.

(6) Liquid Storage Tanks. The plan must describe measures that prevent or minimize contamination of storm water runoff from above ground liquid storage tanks. At a minimum the facility operator must consider employing the following measures or an equivalent:

(a) Use protective guards around tanks.

(b) Use containment curbs.

(c) Use spill and overflow protection (drip pans, drip diapers, and/or other containment devices shall be placed beneath chemical connectors to contain any spillage that may occur during deliveries or due to leaks at such connectors).

(d) Use dry cleanup methods.

(7) Large Bulk Fuel Storage Tanks. The plan must describe measures that prevent or minimize contamination of storm water runoff from liquid storage tanks. At a minimum the facility operator must consider employing the following measures or an equivalent:

(a) Comply with applicable State and Federal laws, including Spill Prevention Control and Countermeasures (SPCC)

(b) Containment berms.

(8) The plan must describe measures to reduce the potential for an oil or chemical spill, or reference the appropriate section of their SPCC plan. At a minimum the structural integrity of all above ground tanks, pipelines, pumps and other related equipment shall be visually inspected on a weekly basis. All repairs deemed necessary based on the findings of the inspections shall be completed immediately to reduce the incidence of spills and leaks occurring from such faulty equipment.

(9) Oil Bearing Equipment in Switchyards. The plan must describe measures to reduce the potential for storm water contamination from oil bearing equipment in switchyard areas. The facility may consider level grades and gravel surfaces to retard flows and limit the spread of spills; collection of storm water runoff in perimeter ditches.

(10) Residue Hauling Vehicles. All residue hauling vehicles shall be inspected for proper covering over the load, adequate gate sealing and overall integrity of the body or container. Vehicles without load covers or adequate gate sealing, or with poor body or container conditions must be repaired as soon as practicable.

(11) Ash Loading Areas. Plant procedures shall be established to reduce and/or control the tracking of ash or residue from ash loading areas including, where practicable, requirements to clear the ash building floor and immediately adjacent roadways of spillage, debris and excess water before each loaded vehicle departs.

(12) Areas Adjacent to Disposal Ponds or Landfills. The plan must describe measures that prevent or minimize contamination of storm water runoff from areas adjacent to disposal ponds or landfills. The facility must develop procedures to:

(a) Reduce ash residue which may be tracked on to access roads traveled by residue trucks or residue handling vehicles.

(b) Reduce ash residue on exit roads leading into and out of residue handling areas.

(13) Landfills, Scrapyards, and General Refuse Sites. The plan must address landfills, scrapyards, and general refuse sites. The permittee is referred to Parts XI.L. and XI.N. of today's permit (Storm Water Discharges From Landfills and Land Application Sites and Scrap and Waste Material Processing and Recycling Facilities, respectively) for applicable Best Management Practices.

(14) Maintenance Activities. For vehicle maintenance activities

performed on the plant site, the permittee shall consider the applicable Best Management Practices outlined in Part XI.P. of today's permit (Storm Water Discharges From Vehicle Maintenance or Equipment Cleaning Operations at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, or the United States Postal Service).

(15) Material Storage Areas. The plan must describe measures that prevent or minimize contamination of storm water from material storage areas (including areas used for temporary storage of miscellaneous products and construction materials stored in lay down areas). The facility operator may consider flat yard grades, runoff collection in graded swales or ditches, erosion protection measures at steep outfall sites (e.g., concrete chutes, riprap, stilling basins), covering lay down areas, storing the materials indoors, covering the material with a temporary covering made of polyethylene, polyurethane, polypropylene, or hypalon. Storm water runon may be minimized by constructing an enclosure or building a berm around the area.

Based on information provided in part 1 of the group application process, the management practices applicable to the 15 areas listed above are commonly used at many steam electric power generating facilities. EPA believes that the incorporation of management practices to accomplish the objectives described above, in conjunction with the baseline requirements, will substantially reduce the potential for these activities and areas to significantly contribute to the pollution of storm water discharges. EPA believes that these requirements provide the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with different facilities.

(c) Inspections. Under the inspection requirements of the storm water pollution prevention plan elements, this section requires that in addition to the comprehensive site evaluation required under Part VIII.C.4. of today's permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility on a monthly basis. The following areas shall be included in the inspection: coal handling areas, fueling areas, loading/unloading areas, switchyards, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks and long term and short term material storage areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained onsite.

The purpose of the inspections is to check on the implementation of the storm water pollution prevention plan. The inspections allow facility personnel to monitor the success or failure of elements of the plan on a regular basis.

d. Employee Training. Steam electric power generating facilities are required to identify periodic training dates in the pollution prevention plan, but in all cases training must be held at least annually. EPA believes that such a frequency is necessary due to the many areas with a high potential for contamination of storm water.

5. Numeric Effluent Limitations

Coal pile runoff is subject to the effluent guidelines described in Part V.B of today's permit. However, steam electric generating facilities must comply with the requirement of Part V.B immediately upon permit issuance. Steam electric generating facilities are not permitted to take 3 years to meet this requirement.

6. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. EPA believes that steam electric power generating facilities may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires steam electric power generating facilities to collect and analyze samples of their storm water discharges for the pollutant listed in Table O–3. The pollutant listed in Table O–3 was found to be above levels of concern for a significant portion of steam electric power generating facilities that submitted quantitative data in the group application process. Because this pollutant has been reported at or above levels of concern from steam electric power generating facilities, EPA is requiring monitoring after the pollution prevention plan has been implemented to assess the effectiveness of the pollution prevention plan and to help ensure that a reduction of pollutants is realized.

Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity". The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, zinc is above the bench mark concentrations for the steam electric generating facilities sector. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in this sector, EPA has determined that the higher concentrations of zinc are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require steam electric generating facilities to conduct analytical monitoring for this parameter.

At a minimum, storm water discharges from steam electric power generating facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table O–3. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE O–3.—MONITORING REQUIREMENTS FOR STEAM ELECTRIC POWER GENERATING FACILITIES

Pollutant of concern	Cut-Off concentration
Total Recoverable Iron ...	1.0 mg/L

If the average concentration for a parameter is less than or equal to the value listed in Table O–3, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table O–3, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm

water discharges consistent with the average concentrations recorded during the second year of the permit.

TABLE O–5.—Schedule of Monitoring

2nd Year of Permit Coverage	• conduct quarterly monitoring. • calculate the average concentration for all parameters analyzed during this period. • if average concentration is greater than the value listed in Table O–3, then quarterly sampling is required during the fourth year of the permit. • if average concentration is less than or equal to the value listed in Table O–3, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• conduct quarterly monitoring for any parameter where the average concentration in year two of the permit is greater than the value listed in Table O–3. • if industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

The monitoring cut off concentrations listed in Table O–3 are not numerical effluent limitations. These values represent a level of pollutant discharge which facilities may achieve through the implementation of pollution prevention plans. At least half of the facilities which submitted Part 2 data, reported concentrations greater than or equal to the values listed in Table O–3. Facilities which achieve average discharge concentrations which are less than or equal to the values in Table O–3 are not relieved from the pollution prevention plan requirements or any other requirements of the permit.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities which do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined that if materials and activities are not exposed to storm water at the site then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of the monitoring reports required under paragraph c. below, under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to EPA in accordance with Part VI.C. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph c. below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within three months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report form must be submitted to the Director per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

If storm water discharges associated with industrial activity commingle with process or non-process water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls provided that the permittee

includes in the storm water pollution prevention plan a description of the location of the outfalls and explaining in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g., low (under 40 percent), medium (40 to 65 percent) or high (above 65 percent)) shall be provided in the plan.

f. Compliance Monitoring Requirements. Today's permit requires permittees with coal pile runoff associated with steam electric power generation to monitor for the presence of total suspended solids and pH at least annually. These monitoring requirements are necessary to evaluate compliance with the numeric effluent limitation imposed on these discharges. Monitoring shall be performed upon a minimum of one grab sample. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. Monitoring results shall be submitted on Discharge Monitoring Report Form(s) postmarked no later than the last day of the month following collection of the sample. For each outfall, one Discharge Monitoring Report from must be submitted per storm event sampled. Facilities which discharge through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit signed copies of discharge monitoring reports to the operator of the municipal separate storm sewer system. Alternative Certification provisions described in Section XI.O.5 do not apply to facilities subject to compliance monitoring requirements in this section. Compliance monitoring is required at least annually for discharges subject to effluent limitations. Therefore, EPA cannot permit a facility to waive compliance monitoring.

g. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of storm water discharges from each outfall are required at steam electric generating facilities. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each quarter of the permit during daylight unless there is insufficient rainfall or snow-melt to runoff. Where practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands on examination will enhance the staff's understanding of the storm water problems on that site and effects on the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

P. Storm Water Discharges Associated With Industrial Activity From Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, Rail Transportation Facilities, and United States Postal Service Transportation Facilities

1. Discharges Covered Under This Section

Special conditions have been developed for ground transportation facilities and rail transportation facilities that have vehicle and equipment maintenance shops (vehicle and equipment rehabilitation, mechanical repairs, painting, fueling and lubrication) and equipment cleaning operations. Vehicle and equipment maintenance is a broad term used to include the following activities: vehicle and equipment fluid changes, mechanical repairs, parts cleaning, sanding, refinishing, painting, fueling, locomotive sanding (loading sand for traction), storage of vehicles and equipment waiting for repair or maintenance, and storage of the related materials and waste materials, such as oil, fuel, batteries, tires, or oil filters. Equipment cleaning operations include areas where the following types of activities take place: vehicle exterior wash down, interior trailer washouts, tank washouts, and rinsing of transfer equipment. Any storm water discharges from facilities where such activities take place are subject to the special conditions described in Part XI.P. of today's permit.

The conditions in this section apply to storm water discharges from vehicle and equipment maintenance shops or cleaning operations located on any of the industrial facilities covered under the storm water application regulations (40 CFR 122.26) and applying for coverage under this permit.

As background, the storm water application regulations define storm water discharge associated with industrial activity at 40 CFR 122.26(b)(14). Category (viii) of this definition includes transportation facilities classified as Standard Industrial Classification (SIC) codes 40, 41, 42 (except 4221–25), 43, 44, 45, and 5171 that have vehicle and equipment maintenance shops, equipment cleaning operations, or airport deicing operations. The category further states that only those portions of the facility that are either involved in vehicle and equipment maintenance (including vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations are associated with industrial activity. The facilities that would potentially be covered by this section of today's permit are transportation facilities (commonly assigned SIC codes 40, 41, 42, 43, and 5171).

This sector includes facilities primarily engaged in furnishing transportation by line-haul railroad, and switching and terminal establishments (SIC code 40). The following are examples of these types of facilities: electric railroad line-haul operation, railroad line-haul operation, interurban railways, beltline railroads, logging railroads, railroad terminals, and stations operated by railroad terminal companies.

Facilities primarily engaged in furnishing local and suburban transportation (SIC code 41), such as those providing transportation in and around a municipality by bus, rail, or subway are also covered under this section. Examples include: bus line operation, airport transportation service (road or rail), cable car operation, subway operation, ambulance service, sightseeing buses, van pool operation, limousine rental with drivers, taxicab operation, and school buses not operated by the educational institution.

In addition, facilities providing local or long-distance trucking, transfer, and/or storage services (SIC code 42) are included in this sector. The following are examples of such facilities: hauling by dump truck, trucking timber, contract mail carriers, furniture moving, garbage collection without disposal, over-the-road trucking, long distance trucking, and freight trucking terminal.

All establishments of the United States Postal Service (SIC code 43) and establishments engaged in the wholesale distribution of crude petroleum and petroleum products from bulk liquid storage facilities (SIC code 5171) are also covered under this sector.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Pollutants Found in Storm Water Discharges From Vehicle and Equipment Maintenance and Cleaning Operations

The following table lists potential pollutant source activities that commonly take place at vehicle and equipment maintenance and equipment cleaning operations.

TABLE P–1.—POTENTIAL POLLUTANT SOURCE ACTIVITIES AT VEHICLE AND EQUIPMENT MAINTENANCE AND EQUIPMENT CLEANING OPERATIONS

Activity	Pollutant source	Pollutant
Fueling	Spills and leaks during fuel delivery	Fuel, oil, heavy metals.
	Spills caused by "topping off" fuel tanks	Fuel, oil, heavy metals.
	Rainfall falling on the fuel area or storm water running onto the fuel area.	Fuel, oil, heavy metals.
	Hosing or washing down fuel area	Fuel, oil, heavy metals.
	Leaking storage tanks	Fuel, oil, heavy metals.
Vehicle and equipment maintenance.	Parts cleaning	Chlorinated solvents, oil, heavy metals, acid/alkaline wastes.
	Waste disposal of greasy rags, oil filters, air filters, batteries, hydraulic fluids, transmission fluid, radiator fluids, degreasers.	Oil, heavy metals, chlorinated solvents, acid/alkaline wastes, ethylene glycol.
	Spills of oil, degreasers, hydraulic fluids, transmission fluid, radiator fluids.	Oil, arsenic, heavy metals, organics, chlorinated solvents, ethylene glycol.
	Fluids replacement, including oil, hydraulic fluids, transmission fluid, radiator fluids.	Oil, arsenic, heavy metals, organics, chlorinated solvents, ethylene glycol.
Outdoor vehicle and equipment storage and parking.	Leaking vehicle fluids including hydraulic lines and radiators, leaking or improperly maintained locomotive on-board drip collection systems, brake dust..	Oil, hydraulic fluids, arsenic, heavy metals, organics, fuel.
Painting areas	Paint and paint thinner spills	Paint, spent chlorinated solvents, heavy metals.
	Spray painting	Paint solids, heavy metals.
	Sanding or paint stripping	Dust, paint solids, heavy metals.
	Paint clean-up	Paint, spent chlorinated solvents, heavy metals.
Railroad locomotive sanding	Loading traction sand on locomotives	Sediment.
Vehicle or equipment washing areas.	Washing or steam cleaning	Oil, detergents, heavy metals, chlorinated solvents, phosphorus, salts, suspended solids.
Liquid storage in above ground storage.	External corrosion and structural failure	Fuel, oil, heavy metals, materials being stored.
	Installation problems	Fuel, oil, heavy metals, materials being stored.
	Spills and overfills due to operator error	Fuel, oil, heavy metals, materials being stored.
	Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves).	Fuel, oil, heavy metals, materials being stored

TABLE P–1.—POTENTIAL POLLUTANT SOURCE ACTIVITIES AT VEHICLE AND EQUIPMENT MAINTENANCE AND EQUIPMENT CLEANING OPERATIONS—Continued

Activity	Pollutant source	Pollutant
	Leaks or spills during pumping of liquids from barges, trucks, or rail cars to a storage facility.	Fuel, oil, heavy metals, materials being stored.
Cold weather activities	Salt application	Sodium chloride.
	Dirt/ash application	Suspended solids, heavy metals
Improper connections to storm sewer.	Process wastewater	Dependent on operations.
	Sanitary water	Bacteria, biochemical oxygen demand (BOD), suspended solids.
	Floor drains	Oil, heavy metals, chlorinated solvents, fuel, ethylene glycol.
	Vehicle washwaters	Oil, detergents, metals, chlorinated solvents, phosphorus, suspended solids.
	Radiator flushing wastewater	Ethylene glycol.
	Leaky underground storage tanks	Materials stored or previously stored.

Sources: EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Refinishing Industry." EPA/625/7–91/016.
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Repair Industry." EPA/625/7–91/013.
EPA, Office of Research and Development. May 1992. "Facility Pollution Prevention Guide." EPA/600/R–92/088.
EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities—Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.
U.S. Postal Service. May 1992. "NPDES/Storm Water Guide." AS–554.

Based on the wide variety of industrial activities and significant materials at the facilities included in this sector, EPA believes it is appropriate to divide the land transportation industry into subsectors to properly analyze sampling data and determine monitoring requirements. As a result, this sector has been divided into the following subsectors: railroad transportation; local and highway passenger transportation; motor freight transportation and warehousing; United States Postal Service; and petroleum bulk stations and terminals. The tables below include data for the eight pollutants that all facilities were required to monitor for under Form 2F. The tables also list those parameters that EPA has determined may merit further monitoring.

TABLE P–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY RAILROAD TRANSPORTATION FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	100	89	141	126	17.3	9.6	0.0	0.0	310.0	155.0	7.0	6.0	51.8	26.8	102.8	44.8
COD	102	89	143	124	820.0	179.8	0.0	0.0	11800	5470.0	145.0	89.0	879.3	475.3	1848.1	927.8
Nitrate + Nitrite Nitrogen	103	89	144	124	1.57	1.32	0.00	0.00	19.50	19.00	0.92	0.78	5.66	3.68	12.01	6.76
Total Kjeldahl Nitrogen	103	89	144	124	4.35	3.00	0.00	0.00	72.00	58.00	1.90	1.50	13.63	8.79	29.13	17.39
Oil & Grease	104	N/A	144	N/A	33.7	N/A	0.0	N/A	3340.0	N/A	0.0	N/A	46.92	N/A	140.26	N/A
pH	95	N/A	133	N/A	N/A	N/A	3.6	N/A	10.2	N/A	7.3	N/A	9.2	N/A	10.2	N/A
Total Phosphorus	103	89	144	124	2.85	1.02	0.00	0.00	180.00	23.00	0.55	0.44	7.05	3.51	19.63	8.19
Total Suspended Solids	103	89	144	124	474	221	0	0	4680	2620	176	77	2717	1000	9367	2853
Lead, Total	3	4	4	6	0.088	0.048	0.042	0.012	0.130	0.070	0.09	0.06	0.208	0.151	0.313	0.268
Zinc, Total	3	4	3	5	0.487	0.337	0.140	0.160	0.920	0.510	0.40	0.28	1.756	0.704	3.341	0.995

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE P–3.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY LOCAL AND HIGHWAY PASSENGER TRANSPORTATION FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	46	45	50	50	15.9	12.3	0.0	0.0	235.3	104.8	8.5	6.3	46.4	41.3	91.6	85.4
COD	47	45	51	50	51.4	39.2	0.0	0.0	376.0	216.0	18.5	18.4	186.2	123.8	411.4	228.8
Nitrate + Nitrite Nitrogen	46	43	50	48	14.39	7.66	0.00	0.10	181.40	104.00	1.79	1.30	66.44	28.71	265.35	96.75
Total Kjeldahl Nitrogen	45	44	49	49	4.22	2.37	0.00	0.00	81.26	15.74	1.82	1.20	11.84	8.23	24.12	16.53
Oil & Grease	53	N/A	59	N/A	47.1	N/A	0.0	N/A	771.0	N/A	6.0	N/A	183.0	N/A	621.6	N/A
pH	52	N/A	58	N/A	N/A	N/A	4.7	N/A	9.4	N/A	7.0	N/A	8.8	N/A	9.7	N/A
Total Phosphorus	47	45	52	50	0.92	0.65	0.00	0.00	7.50	7.00	0.33	0.33	3.40	2.32	8.20	5.12
Total Suspended Solids	46	46	50	51	246	134	0	0	2320	862	70	41	1319	725	4590	2397

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE P–4.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY MOTOR FREIGHT TRANSPORTATION AND WAREHOUSING FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	183	159	237	212	16.5	9.1	0.0	0.0	510.0	66.0	7.0	5.5	48.9	27.4	100.2	49.6
COD	185	158	242	210	146.1	82.0	0.0	0.0	1800.0	600.0	79.0	50.5	475.6	253.8	968.6	479.8
Nitrate + Nitrite Nitrogen	179	159	234	210	1.47	1.30	0.00	0.00	90.80	60.50	0.61	0.49	3.86	3.63	8.21	8.16
Total Kjeldahl Nitrogen	185	159	242	211	2.25	1.46	0.00	0.00	24.00	15.00	1.40	1.10	6.73	4.23	12.70	7.39
Oil & Grease	188	N/A	245	N/A	14.0	N/A	0.0	N/A	1340.0	N/A	2.8	N/A	37.8	N/A	95.1	N/A
pH	161	N/A	215	N/A	N/A	N/A	2.6	N/A	9.5	N/A	7.3	N/A	9.6	N/A	11	N/A
Total Phosphorus	184	157	238	208	1.09	0.61	0.00	0.00	37.40	6.80	0.32	0.29	3.64	2.16	9.30	4.72
Total Suspended Solids	185	158	242	210	466	360	0	0	4700	20900	159	90	2638	1448	9012	4615
Zinc, Total	7	5	7	5	0.294	0.159	0.031	0.020	1.100	0.370	0.17	0.08	1.111	0.680	2.434	1.496

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE P–5.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY UNITED STATES POSTAL SERVICE FACILITIES SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	16	16	22	22	8.1	9.2	0.0	0.0	25.0	62.0	5.5	4.8	22.6	25.2	38.0	44.5
COD	16	16	22	22	51.4	33.8	5.6	0.0	350.0	190.0	26.5	19.5	148.2	95.5	291.5	167.6
Nitrate + Nitrite Nitrogen	16	16	22	22	0.52	0.75	0.11	0.07	1.30	1.80	0.40	0.61	1.47	2.51	2.57	4.81
Total Kjeldahl Nitrogen	16	16	22	22	1.80	1.91	0.00	0.00	11.00	11.00	1.05	0.97	5.01	6.08	8.98	12.22
Oil & Grease	16	N/A	22	N/A	5.4	N/A	0.0	N/A	21.0	N/A	4.4	N/A	16.0	N/A	27.3	N/A
pH	16	N/A	22	N/A	N/A	N/A	0.1	N/A	8.4	N/A	6.7	N/A		N/A		N/A
Total Phosphorus	16	16	22	22	0.46	0.47	0.00	0.00	2.50	3.40	0.28	0.20	1.41	1.79	2.77	4.48
Total Suspended Solids	15	16	21	22	16	13	0	0	77	86	4	1	88	77	210	254
Zinc, Total	14	15	18	18	0.228	0.175	0.000	0.000	1.400	0.660	0.11	0.11	1.870	1.069	6.335	2.896

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

TABLE P–6.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY PETROLEUM BULK STATIONS AND TERMINALS SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant, Sample	# of Facilities		# of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	11	10	11	10	27.7	10.2	1.3	0.0	120.0	31.0	8.0	9.0	111.5	26.0	303.4	40.6
COD	11	10	11	10	118.3	75.9	15.0	9.3	390.0	200.0	94.0	60.5	432.7	232.4	900.6	412.4
Nitrate + Nitrite Nitrogen	11	10	11	10	1.07	0.74	0.00	0.00	5.10	2.90	0.35	0.39	4.83	3.20	13.44	7.51
Total Kjeldahl Nitrogen	10	9	10	9	2.60	2.02	0.00	0.00	5.80	4.60	2.80	2.00	7.14	4.39	11.47	6.11
Oil & Grease	11	N/A	11	N/A	8.8	N/A	0.0	N/A	28.0	N/A	5.4	N/A	36.7	N/A	78.5	N/A
pH	10	N/A	10	N/A	N/A	N/A	6.0	N/A	9.3	N/A	7.8	N/A	9.6	N/A	10.5	N/A
Total Phosphorus	11	10	11	10	0.61	0.45	0.00	0.04	4.60	2.0	0.12	0.27	1.90	1.71	4.82	3.92
Total Suspended Solids	11	10	11	10	253	151	6	0	1090	560	106	93	1612	633	5567	1387

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

The measures commonly implemented to reduce pollutants in storm water associated with vehicle and equipment maintenance and equipment cleaning operations are generally uncomplicated practices. The following table identifies best management practices (BMPs) associated with different activities that routinely take place at vehicle and equipment maintenance and equipment cleaning operations.

TABLE P–7.—COMMON STORM WATER MANAGEMENT CONTROLS FOR ACTIVITIES AT VEHICLE AND EQUIPMENT MAINTENANCE SHOPS

Activity	BMPs
Fueling	Use spill and overflow protection. Minimize runon of storm water into the fueling area by grading the area such that storm water only runs off. Reduce exposure of the fuel area to storm water by covering the area. Use dry cleanup methods for fuel area rather than hosing the fuel area down. Use proper petroleum spill control. Perform preventive maintenance on storage tanks to detect potential leaks before they occur. Inspect the fueling area to detect problems before they occur. Train employees on proper fueling techniques.
Vehicle and equipment maintenance	Maintain an organized inventory of materials used in the maintenance shop. Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers properly. Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries).

TABLE P–7.—COMMON STORM WATER MANAGEMENT CONTROLS FOR ACTIVITIES AT VEHICLE AND EQUIPMENT MAINTENANCE SHOPS—Continued

Activity	BMPs
	Drain oil filters before disposal or recycling.
	Drain and contain all fluids from wrecked vehicles and "parts" cars.
	Store cracked batteries in a nonleaking secondary container.
	Promptly transfer used fluids to the proper container; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers.
	Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.
	Plug floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly.
	Inspect the maintenance area regularly for proper implementation of control measures.
	Train employees on proper waste control and disposal procedures.
Outdoor vehicle and equipment storage and parking.	Use drip pans under all vehicles and equipment waiting for maintenance.
	Cover the storage area with a roof.
	Inspect the storage yard for filling drip pans and other problems regularly.
	Train employees on procedures for storage and inspection items.
Locomotive sanding areas	Cover sand storage piles.
	Install sediment traps.
	Install curbs or dikes around storage piles to minimize storm water runon.
Painting areas	Keep paint and paint thinner away from traffic areas to avoid spills.
	Spray paint in an Occupational Safety and Health Act (OSHA) approved hood.
	Use effective spray equipment that delivers more paint to the target and less over-spray.
	Avoid sanding in windy weather and collect and dispose of waste properly.
	Recycle paint, paint thinner, and solvents.
	Inspect painting procedures to ensure that they are conducted properly.
	Train employees on proper sanding, painting, and spraying techniques.
Vehicle or equipment washing areas	Avoid washing parts or equipment outside.
	Use phosphate-free biodegradable detergents.
	Designate an area for cleaning activities.
	Contain and recycle washwaters.
	Ensure that washwaters drain well.
	Inspect cleaning area regularly.
	Train employees on proper washing procedures.
Liquid storage in above ground storage	Maintain good integrity of all storage containers.
	Install safeguards (such as diking or berming) against accidental releases at the storage area.
	Inspect storage tanks to detect potential leaks and perform preventive maintenance.
	Inspect piping systems (pipes, pumps, flanges, couplings, hoses, and valves) for failures or leaks.
	Train employees on proper filling and transfer procedures.
Cold weather activities	Minimize salt application.
	Use uncontaminated dirt or ash, if use is necessary.
	Train employees on proper salt, dirt, sand, or ash application
Improper connections to storm sewer	Plug all floor drains connected to sanitary or storm sewer or if connection is unknown. Alternatively, install a sump that is pumped regularly.
	Perform smoke or dye testing to determine if interconnections exist between sanitary water system and storm sewer system.
	Update facility schematics to accurately reflect all plumbing connections.
	Install a safeguard against vehicle washwaters entering the storm sewer unless permitted.
	Maintain and inspect the integrity of all underground storage tanks; replace when necessary.
	Train employees on proper disposal practices for all materials.

Sources: NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991, through December 31, 1992.
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Refinishing Industry." EPA/625/7–91/016.
EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Repair Industry." EPA/625/7–91/013.
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EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities—Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.
U.S. Postal Service. May 1992. "NPDES/Storm Water Guide." AS–554.

4. Pollutant Control Measures Required Through Other EPA Programs

EPA recognizes that other programs address the operation of vehicle and equipment maintenance and equipment cleaning operations. In particular, as described below, the Resource Conservation and Recovery Act (RCRA) and the Underground Storage Tank (UST) programs require careful management of materials used onsite which decreases the probability that storm water from such areas will be contaminated by these materials.

Under the RCRA program, on September 10, 1992, EPA promulgated standards in 40 CFR Part 279 for the management of used oils that are recycled (57 FR 41566). These standards include requirements for used oil generators, transporters, processors/re-refiners, and burners. The standards for used oil generators apply to all generators, regardless of the amount of used oil they generate. Do-it-yourself (DIY) generators which generate used oil from the maintenance of their personal vehicles, however, are not subject to the management standards (Section 279.20(a)(1)).

The requirements for used oil generators were designed to impose a minimal burden on generators while

protecting human health and the environment from the risks associated with managing used oil. Under Subpart C of 40 CFR Part 279, used oil generators must not store used oil in units other than tanks, containers, or units subject to regulation under Part 264 or 265 of 40 CFR (Section 279.22(a)). In other words, generators may store used oil in tanks or containers that are not subject to Subpart J (Hazardous Waste Tanks) or Subpart I (Containers) of Parts 264/265, as long as such tanks or containers are maintained in compliance with the used oil management standards. This does not preclude generators from storing used oil in Subpart J tanks or Subpart I containers or other units, such as surface impoundments (Subpart K), that are subject to regulation under Part 264 or 265.

Storage units at generator facilities must be maintained in good condition and labeled with the words "used oil." Upon detection of a release of used oil to the environment, a generator must take steps to stop the release, contain the released used oil, and properly manage the released used oil and other materials (Sections 279.22(b) to (d)). Generators storing used oil in underground storage tanks are subject to the UST regulations in 40 CFR Part 280.

If used oil generators ship used oil offsite for recycling, they must use a transporter who has notified EPA and obtained an EPA identification number (Section 279.24).

The technical standards for USTs at 40 CFR Part 280 require that new UST systems (defined as systems for which installation commenced after December 12, 1988) use overfill prevention equipment that will: 1) automatically shut off flow into the tank when the tank is no more than 95 percent full; or 2) alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high level alarm. The preceding requirements do not apply to systems that are filled by transfers of no more than 25 gallons at one time. Existing UST systems (defined as systems for which installation has commenced on or before December 12, 1988) are required to have installed the described overfill prevention equipment by December 12, 1998.

5. Special Conditions

The permit conditions that apply to ground transportation facilities build upon the requirements set forth in the common permit conditions for storm water discharges from industrial activities described in the front of this fact sheet. The discussion that follows, therefore, only addresses conditions that differ from those required in that section.

Due to concern that many non-storm water discharges may be present at vehicle and equipment cleaning and maintenance facilities, EPA is requiring that all facilities provide proof that these discharges are not commingled and are appropriately controlled so as to protect all receiving waters.

Today's permit clarifies in Part III.A.2. (Prohibition of Non-storm Water Discharges) that non-storm water discharges, including vehicle and equipment washwaters, are not authorized by this permit. The operators of such non-storm water discharges must obtain coverage under a separate NPDES permit if discharged to waters of the U.S. or through a municipal separate storm sewer system or comply with applicable industrial pretreatment requirements if discharged to a municipal sanitary sewer system. In a related requirement under the storm water pollution prevention plan requirements, the permittee is required to attach a copy of the NPDES permit issued for vehicle washwaters or, if an NPDES permit has not yet been issued, a copy of pending application to the plan. For facilities that discharge vehicle and equipment washwaters to the sanitary sewer system, the operator of the sanitary system and associated treatment plant must be notified. A copy of the notification letter must be attached to the plan. If an industrial user permit is issued under a pretreatment program, a copy of that permit must be attached in the plan as does any other permit to which the facility is subject. Some facilities may use other methods of disposal, such as collecting and hauling the wash water offsite. In these cases, the facility must document how the wash water is disposed and attach all pertinent documentation of that disposal practice to the plan.

6. Storm Water Pollution Prevention Plan Requirements

a. Description of Potential Pollutant Sources. Under the description of potential pollutant sources in the storm water pollution prevention plan requirements, permittees are required to include storage areas for vehicles and equipment awaiting maintenance on their facility site map. EPA believes that this is appropriate since this area may potentially be a significant source of pollutants to storm water.

b. Measures and Controls. Under the description of measures and controls in the storm water pollution prevention plan requirements, this section requires that all areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. This section also requires that the following areas must be specifically addressed:

(1) Vehicle and Equipment Storage Areas. The storage of vehicles and equipment with actual or potential fluid leaks must be confined to designated areas (delineated on the site map). The plan must describe measures that prevent or minimize contamination of the storm water runoff from these areas. The facility shall consider the use of drip pans under vehicles and equipment, indoor storage of the vehicles and equipment, installation of berming and diking of this area, use of absorbents, roofing or covering storage areas, cleaning pavement surface to remove oil and grease, or other equivalent methods.

(2) Fueling Areas. The plan must describe measures that prevent or minimize contamination of the storm water runoff from fueling areas. The facility shall consider covering the fueling area, using spill and overflow protection and cleanup equipment, minimizing runon of storm water to the fueling area, using dry cleanup methods, collecting the storm water runoff and providing treatment or recycling, or other equivalent measures.

(3) Material Storage Areas. Storage units of all materials (e.g., used oil, used oil filters, spent solvents, paint wastes, radiator fluids, transmission fluids, hydraulic fluids) must be maintained in good condition, so as to prevent contamination of storm water, and plainly labeled (e.g., "used oil," "spent solvents," etc.). The plan must describe measures that prevent or minimize contamination of the storm water runoff from such storage areas. The facility shall consider indoor storage of the materials, installation of berming and diking of the area or other equivalent methods.

(4) Vehicle and Equipment Cleaning Areas. The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for vehicle and equipment cleaning. The facility shall consider performing all cleaning operations indoors, covering the cleaning operation, ensuring that all washwaters drain to the intended collection system (i.e., not the storm water drainage system unless NPDES permitted), collecting the storm water runoff from the cleaning area and providing treatment or recycling, or other equivalent measures. The discharge of vehicle and equipment wash waters, including tank cleaning operations, are

not authorized by this section and must be covered under a separate NPDES permit or discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements.

(5) Vehicle and Equipment Maintenance Areas. The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for vehicle and equipment maintenance. The facility shall consider performing all maintenance activities indoors, using drip pans, maintaining an organized inventory of materials used in the shop, draining all parts of fluids prior to disposal, prohibiting the practice of hosing down the shop floor where the practice would result in the exposure of pollutants to storm water, using dry cleanup methods; collecting the storm water runoff from the maintenance area and providing treatment or recycling, or other equivalent measures.

(6) Locomotive Sanding (Loading Sand for Traction) Areas. The plan must describe measures that prevent or minimize contamination of the storm water runoff from areas used for locomotive sanding (including locomotive sanding). The facility shall consider covering sanding areas, minimizing storm water runon/runoff, appropriate sediment removal practices to minimize the offsite transport of sanding material by storm water, or other equivalent measures.

As documented earlier, these six areas are the common sources of pollutants in storm water from vehicle and equipment cleaning and maintenance activities. Based upon the information provided in part 1 of the group application process, the suggested management measures are commonly used at ground transportation facilities. EPA believes that the incorporation of management practices such as those suggested, in conjunction with the baseline requirements, will substantially reduce the potential that these activities and areas will significantly contribute to the pollution of storm water discharges. In addition, EPA believes that these requirements continue to provide the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with different facilities. Further, many facilities will find that management measures that they have already incorporated into the facility's operation, such as the installation of overfill protection equipment and labelling and maintenance of used oil storage units, that are already required under existing EPA programs will meet the requirements of this section.

Under the inspection requirements of the storm water pollution prevention plan elements, this section requires that in addition to the comprehensive site evaluation required under Part XI of today's permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility, at a minimum, on a quarterly basis. The following areas shall be included in all inspections: storage areas for vehicles and equipment awaiting maintenance, fueling areas, vehicle and equipment maintenance areas (both indoors and outdoors), material storage areas, vehicle and equipment cleaning areas, and loading and unloading areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of all inspections shall be maintained.

The purpose of the inspections is to check on the implementation of the storm water pollution prevention plan. The inspections allow facility personnel to monitor the success or failure of elements of the plan on a regular basis. The discharger is encouraged to coordinate these quarterly inspections with the quarterly visual examinations of storm water discharges required under the monitoring section of the permit. The use of an inspection checklist is recommended. The checklist will ensure that all required areas are inspected, as well as help to meet the recordkeeping requirements.

Under the employee training component of the storm water pollution prevention plan requirements, the permittee is required to identify annual (once per year) dates for such training. Employee training must, at a minimum, address the following areas when applicable to a facility: used oil management; spent solvent management; spill prevention and control; fueling procedures; general good housekeeping practices; proper painting procedures; and used battery management. Unlike some industrial operations, the industrial activities associated with vehicle and equipment maintenance that may affect storm water quality require the cooperation of many employees, not just one or two people. EPA, therefore, is requiring that employee training take place at least once a year to serve as: (1) training for new employees that may be involved in storm water pollution prevention; (2) a refresher course for existing employees involved in storm water pollution prevention; and (3) training for all affected employees on any storm water pollution prevention techniques recently incorporated into the plan.

7. Monitoring and Reporting Requirements

a. Monitoring Requirements. The regulatory modifications at 40 CFR 122.44(i)(2) established on April 2, 1992, grant permit writers the flexibility to reduce monitoring requirements in storm water discharge permits. EPA has determined that the potential for storm water discharges to contain pollutants above benchmark levels, because of the industrial activities and materials exposed to precipitation, does not support sampling at facilities in this section of today's permit. Based on a consideration of the BMPs typically used at these facilities, and generally low pollutant values from the application data, EPA believes that the pollution prevention plan with visual observations of storm water discharges will help to ensure storm water contamination is minimized. Because permittees are not required to conduct sampling, they will be able to focus their resources on developing and implementing the pollution prevention plan.

Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity". The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, nitrate plus nitrite nitrogen, lead and/or zinc are above the bench mark concentrations for the railroad transportation, local and highway passenger transportation, motor freight transportation and warehousing, and United States Postal services subsectors. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in these subsectors, EPA has determined that the higher concentrations of nitrate plus nitrite nitrogen, lead and/or zinc are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require railroad transportation, local and highway passenger transportation, motor freight transportation and warehousing, and United States Postal services facilities to conduct analytical monitoring for these parameters.

Quarterly visual examinations of a storm water discharge from each outfall are required at ground transportation facilities. The examination must be of a

grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each designated period during facility operation in the daylight hours unless there is insufficient rainfall or snow-melt to runoff. EPA expects that, whenever practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Examinations shall be conducted in each of the following periods for the purposes of inspecting storm water quality associated with storm water runoff and snow melt: January through March; April through June; July through September; October through December. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan.

EPA believes that this quick and simple assessment will help the permittee to determine the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the results of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

As discussed above, EPA does not believe that chemical monitoring is necessary for facilities in this section of today's permit. EPA believes that between quarterly inspections, quarterly visual examinations, and site compliance evaluations potential sources of contaminants can be recognized, addressed, and then controlled with BMPs. In determining the monitoring requirements, EPA considered the nature of the industrial activities and significant materials exposed at these sites, and performed a review of data provided in Part 2 group applications.

Q. Storm Water Discharges Associated With Industrial Activity From Water Transportation Facilities That Have Vehicle Maintenance Shops and/or Equipment Cleaning Operations

1. Discharges Covered Under This Section

Special conditions have been developed for water transportation facilities that have vehicle and equipment maintenance shops (vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, and lubrication) and equipment cleaning operations. Vehicle and equipment maintenance is a broad term used to include the following activities: vessel and equipment fluid changes, mechanical repairs, parts cleaning, sanding, blasting, welding, refinishing, painting, fueling, and storage of the related materials and waste materials, such as oil, fuel, batteries, or oil filters. Equipment cleaning operations include areas where vessel and vehicle exterior washdown takes place. The conditions in this section apply to storm water discharges from vehicle and equipment maintenance shops or cleaning operations located at water transportation facilities covered under the storm water application regulations (40 CFR 122.26) and applying for coverage under today's permit.

The storm water application regulations define storm water discharges associated with industrial activity at 40 CFR 122.26(b)(14). Category (viii) of this definition includes transportation facilities classified as Standard Industrial Classification (SIC) codes 40, 41, 42 (except 4221–25), 43, 44, 45, and 5171 that have vehicle and equipment maintenance shops, equipment cleaning operations, or airport deicing operations. The category further states that only those portions of the facility that are either involved in vehicle and equipment maintenance (including vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations are associated with industrial activity. The conditions in this section only apply to water transportation facilities.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

Facilities covered by this section of today's permit are commonly identified by SIC code major group 44.

SIC code 44 includes facilities primarily engaged in furnishing water transportation services. The following types of facilities are examples of those covered under SIC code 44:

a. Deep Sea Foreign Transportation of Freight (SIC 4412).

b. Deep Sea Domestic Transportation of Freight (SIC 4424).

c. Freight Transportation on the Great Lakes—St. Lawrence Seaway (SIC 4432).

d. Water Transportation of Freight, Not Elsewhere Classified (SIC 4449). Including: canal barge operations; canal freight transportation; intracoastal

freight transportation lake freight transportation, except on the Great Lakes; log rafting and towing; river freight transportation, except on the St. Lawrence Seaway; and transportation of freight on bays and sounds of the oceans.

e. Deep Sea Transportation of Passengers, Except by Ferry (SIC 4481).

f. Ferries (SIC 4482). Including: car lighters (ferries); and railroad ferries.

g. Water Transportation of Passengers, Not Elsewhere Classified (SIC 4489). Including: airboats (swamp buggy rides); excursion boat operations; passenger water transportation on rivers and canals; sightseeing boats; and water taxis.

h. Marine Cargo Handling (SIC 4491). Including: docks, including buildings and facilities; loading vessels; marine cargo handling; piers, including buildings and facilities; ship hold cleaning; stevedoring; unloading vessels; and waterfront terminal operation.

i. Towing and Tugboat Services (SIC 4492). Including: docking of ocean vessels; shifting of floating equipment within harbors; towing services, marine; tugboat service; and undocking of ocean vessels.

j. Marinas (SIC 4493).[97] Including: boat yards, storage and incidental repair; and yacht basins.

k. Water Transportation Services, Not Elsewhere Classified (SIC 4499). Including: boat cleaning; boat hiring, except pleasure; boat livery, except pleasure; boat rental, commercial; canal operation; cargo salvaging, from distressed vessels; chartering of commercial boats; dismantling ships; lighterage; marine railways for drydocks; marine salvaging; marine surveyors, except cargo; marine wrecking, ships for scrap; piloting vessels in and out of harbors; ship cleaning, except hold cleaning; ship registers: survey and classification of ships and marine equipment; and steamship leasing.

2. Pollutants Found in Storm Water Discharges

Table Q–1 lists potential pollutant source activities that commonly take place at water transportation vehicle maintenance and equipment cleaning operations.

TABLE Q–1.—INDUSTRIAL ACTIVITIES, POLLUTANT SOURCES, AND POLLUTANTS

Activity	Pollutant source	Pollutant
Pressure Washing	Wash water	Paint solids, heavy metals, suspended solids.
Surface Preparation Paint Removal Sanding	Sanding; mechanical grinding; abrasive blasting; paint stripping.	Spent abrasives, paint solids, heavy metals, solvents, dust.
Painting	Paint and paint thinner spills; spray painting; paint stripping; sanding; paint cleanup.	Paint solids, spent solvents, heavy metals, dust.
Engine Maintenance and Repairs	Parts cleaning; waste disposal of greasy rags, used fluids, and batteries; use of cleaners & degreasers; fluid spills; fluid replacement.	Spent solvents, oil, heavy metals, ethylene glycol, acid/alkaline wastes, detergents.
Material Handling: Transfer Storage Disposal	Fueling: spills; leaks; and hosing area	Fuel, oil, heavy metals.
	Liquid Storage in Above Ground Storage: spills and overfills; external corrosion; failure of piping systems.	Fuel, oil, heavy metals, material being stored.
	Waste Material Storage and Disposal: paint solids; solvents; trash; spent abrasives, petroleum products.	Paint solids, heavy metals, spent solvents, oil.
Shipboard Processes improperly discharged to storm sewer or into receiving water.	Process & cooling water; sanitary waste; bilge & ballast water.	Biochemical oxygen demand (BOD), bacteria, suspended solids, oil, fuel.

Sources: EPA, Office of Water and Hazardous Materials. December 1979. "Draft Development Document for Proposed Effluent Limitations Guidelines and Standards for the Shipbuilding and Repair Industry." EPA/440/1–79/076–b.

University of South Alabama, College of Engineering. September 1992. "Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities." College of Engineering Report No. 92–2.

NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991, through December 31, 1992.

EPA, Office of Research and Development. October 1991. "Guides to Pollution Prevention—The Automotive Refinishing Industry." EPA/625/7–91/016.

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EPA, Office of Research and Development. May 1992. "Facility Pollution Prevention Guide." EPA/600/R–92/088.

EPA, Office of Water. September 1992. "Storm Water Management for Industrial Activities—Developing Pollution Prevention Plans and Best Management Practices." EPA 832–R–92–006.

U.S. Postal Service. May 1992. "NPDES/Storm Water Guide." AS–554.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at water transportation facilities having vehicle maintenance and/or equipment cleaning operations as a whole and not subdivide this sector. Therefore, Table Q–2 lists data for selected parameters from facilities in the water transportation sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F, as well as the pollutants that EPA determined merit further monitoring.

[97] "Guidelines for the Determination of Regulatory Status of Marinas and Related Operations." Facilities that are "primarily engaged" in operating marinas are best classified as SIC 4493—marinas. These facilities rent boat skips, store boats and generally perform a range of other marine services including boat cleaning and incidental boat repair. They frequently sell food, fuel, fishing supplies and may sell boats. For facilities classified as 4493 that are involved in vehicle (vessel) maintenance activities (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication) or equipment cleaning operations, those portions of the facility that are involved in such vehicle maintenance activities are considered to be associated with industrial activity and are covered under the storm water regulations.

Facilities classified as 4493 that are not involved in equipment cleaning or vessel maintenance activities (including vehicle rehabilitation, mechanical repairs, painting, and lubrication) are not intended to be covered under 40 CFR Section 122.26(b)(14)(viii) of the storm water permit application regulations. The retail sale of fuel alone at marinas, without any other vessel maintenance or equipment cleaning operations, is not considered to be grounds for coverage under the storm water regulations.

TABLE Q–2.—STATISTICS FOR CONVENTIONAL POLLUTANTS AND STORM WATER[i] (IN mg/L UNLESS OTHERWISE INDICATED)

Pollutant Sample type	No. of Facilities		No. of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	15	14	15	14	8.6	6.0	0.0	0.0	39.0	11.0	7.0	6.0	36.3	13.4	76.3	18.7
COD	15	14	15	14	130.9	75.8	0.0	10.0	500.0	203.0	93.0	50.5	588	254.8	1327.6	496.8
Nitrate + Nitrite Nitrogen	15	14	15	14	4.23	0.66	0.00	0.00	54.00	1.61	0.60	0.65	8.61	1.89	23.9	3.07
Total Kjeldahl Nitrogen	15	14	15	14	2.64	9.41	0.00	0.00	16.00	118.00	1.60	0.75	9.72	16.96	20.67	51.31
Oil & Grease	15	N/A	15	N/A	11.9	N/A	0.0	N/A	96.0	N/A	2.0	N/A	40.9	N/A	109.9	N/A
pH (s.u)	15	11	15	N/A	N/A	N/A	4.1	N/A	8.8	N/A	7.0	N/A	9.5	N/A	10.8	N/A
Total Phosphorus	15	14	15	14	0.27	0.15	0.00	0.00	1.20	0.32	0.10	0.17	1.32	0.51	3.19	.90
Total Suspended Solids	15	14	15	14	634	224	3	5	4330	944	135	* 68	3906	1116	1635.2	3351
Aluminum	4	3	4	3	3.1	2.2	0.2	0.2	6.3	5.4	3.0	1.0	24.4	14.2	81.2	40.9
Iron	4	3	4	3	26.7	5.0	0.2	0.4	94.0	8.9	6.3	5.7	N/A	40.6	40.9	122.8
Lead	4	3	4	3	0.2	0.1	0.0	0.0	0.7	0.1	0.1	0.1	N/A	.1	N/A	0.2
Zinc	4	3	4	3	0.7	0.4	0.1	0.2	2.2	0.9	0.2	0.2	N/A	1.3	N/A	2.4

[i] Mean, Maximum, Minimum, Median, and Percentiles include all detects and nondetects.
[ii] Composite samples.
Note: There is no information for 95th percentile columns.

3. Options for Controlling Pollutants

The measures commonly implemented to reduce pollutants in storm water associated with water transportation vehicle maintenance and/or equipment cleaning operations are generally simple to implement and are uncomplicated practices. Table Q–3 identifies Best Management Practices (BMPs) associated with different activities that routinely take place at water transportation facilities with vehicle maintenance and equipment cleaning operations.

TABLE Q–3.—INDUSTRIAL ACTIVITIES AND POTENTIAL BEST MANAGEMENT PRACTICES

Activity	BMPs
Pressure washing	Collect discharge water and remove all visible solids before discharging to a sewer system, or where permitted, to a drainage system, or receiving water.
	Perform pressure washing only in designated areas where wash water containment can be effectively achieved.
	Use no detergents or additives in the pressure wash water.
	Direct deck drainage to a collection system sump for settling and/or additional treatment.
	Implement diagonal trenches or berms and sumps to contain and collect wash water at marine railways.
	Use solid decking, gutters, and sumps at lift platforms to contain and collect wash water for possible reuse.
Surface preparation, sanding, and paint removal.	Enclose, cover, or contain blasting and sanding activities to the extent practical to prevent abrasives, dust, and paint chips from reaching storm sewers or receiving water.
	Where feasible, cover drains, trenches, and drainage channels to prevent entry of blasting debris to the system.
	Prohibit uncontained blasting or sanding activities performed over open water.
	Prohibit blasting or sanding activities performed during windy conditions which render containment ineffective.
	Inspect and clean sediment traps to ensure the interception and retention of solids prior to entering the drainage system.
	Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding.
	Collect spent abrasives routinely and store under a cover to await proper disposal.
Painting	Enclose, cover, or contain painting activities to the maximum extent practical to prevent overspray from reaching the receiving water.
	Prohibit uncontained spray painting activities over open water.
	Prohibit spray painting activities during windy conditions which render containment ineffective.
	Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters, preferably indoors or under cover.
	Have absorbent and other cleanup items readily available for immediate cleanup of spills.
	Allow empty paint cans to dry before disposal.
	Keep paint and paint thinner away from traffic areas to avoid spills.
	Recycle paint, paint thinner, and solvents.
	Train employees on proper painting and spraying techniques, and use effective spray equipment that delivers more paint to the target and less overspray.
Drydock maintenance	Clean and maintain drydock on a regular basis to minimize the potential for pollutants in the storm water runoff.
	Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding.
	If hosing must be used as a removal method, collect wash water to remove solids and potential metals.
	Clean the remaining areas of the dock after a vessel has been removed and the dock raised.
	Remove and properly dispose of floatable and other low-density waste (wood, plastic, insulations, etc.).
Drydocking	Use plastic barriers beneath the hull, between the hull and drydock walls for containment.
	Use plastic barriers hung from the flying bridge of the drydock, from the bow or stern of the vessel, or from temporary structures for containment.

TABLE Q–3.—INDUSTRIAL ACTIVITIES AND POTENTIAL BEST MANAGEMENT PRACTICES—Continued

Activity	BMPs
	Weight the bottom edge of the containment tarpaulins or plastic sheeting during a light breeze.
	Use plywood and/or plastic sheeting to cover open areas between decks when sandblasting (scuppers, railings, freeing ports, ladders, and doorways).
	Install tie rings or cleats, cable suspension systems, or scaffolding to make implementation containment easier.
Nondrydock containment	Hang tarpaulin from the boat, fixed, or floating platforms to reduce pollutants transported by wind.
	Pave or tarp surfaces under marine railways.
	Clean railways before the incoming tide.
	Haul vessels beyond the high tide zone before work commences or halt work during high tide.
	Place plastic sheeting or tarpaulin underneath boats to contain and collect waste and spent materials and clean and sweep regularly to remove debris.
	Use fixed or floating platforms with appropriate plastic or tarpaulin barriers as work surfaces and for containment when work is performed on a vessel in the water to prevent blast material or paint overspray from contacting storm water or the receiving water.
	Sweep, rather than hose, debris present on the dock.
Engine maintenance and repairs	Maintain an organized inventory of materials used in the maintenance shop.
	Dispose of greasy rag, oil filters, air filters, batteries, spent coolant, and degreasers properly.
	Label and track the recycling of waste material (i.e., used oil, spent solvents, batteries).
	Drain oil filters before disposal or recycling.
	Store cracked batteries in a nonleaking secondary container.
	Promptly transfer used fluids to the proper container; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers.
	Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.
	Plug floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly.
	Inspect the maintenance area regularly for proper implementation of control measures.
	Train employees on proper waste control and disposal procedures.
Material Handling: Bulk liquid storage and containment.	Store permanent tanks in a paved area surrounded by a dike system which provides sufficient containment for the larger of either 10 percent of the volume of all containers or 110 percent of the volume of the largest tank.
	Maintain good integrity of all storage tanks.
	Inspect storage tanks to detect potential leaks and perform preventive maintenance.
	Inspect piping systems (pipes, pumps, flanges, couplings, hoses, valves) for failures or leaks.
	Train employees on proper filling and transfer procedures.
Material Handling: Containerized material storage.	Store containerized materials (fuels, paints, solvents, etc.) in a protected, secure location and away from drains.
	Store reactive, ignitable, or flammable liquids in compliance with the local fire code.
	Identify potentially hazardous materials, their characteristics, and use.
	Control excessive purchasing, storage, and handling of potentially hazardous materials.
	Keep records to identify quantity, receipt date, service life, users, and disposal routes.
	Secure and carefully monitor hazardous materials to prevent theft, vandalism, and misuse of materials.
	Educate personnel for proper storage, use, cleanup, and disposal of materials.
	Provide sufficient containment for outdoor storage areas for the larger of either 10 percent of the volume of all containers or 110 percent of the volume of the largest tank.
	Use temporary containment where required by portable drip pans.
	Use spill troughs for drums with taps.
Material Handling	Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters. Locate designated areas preferably indoors or under a shed.
Designated material mixing areas	If spills occur,
	• Stop the source of the spill immediately.
	• Contain the liquid until cleanup is complete.
	• Deploy oil containment booms if the spill may reach the water.
	• Cover the spill with absorbent material.
	• Keep the area well ventilated.
	• Dispose of cleanup materials properly.
	• Do not use emulsifier or dispersant.
Shipboard process water handling	Keep process and cooling water used aboard ships separate from sanitary wastes to minimize disposal costs for the sanitary wastes.
	Keep process and cooling water from contact with spent abrasives and paint to avoid discharging these pollutants.
	Inspect connecting hoses for leaks.
Shipboard sanitary waste disposal	Discharge sanitary wastes from the ship being repaired to the yard's sanitary system or dispose of by a commercial waste disposal company.
	Use appropriate material transfer procedures, including spill prevention and containment activities.
Bilge and Ballast water	Collect and dispose of bilge and ballast waters which contain oils, solvents, detergents, or other additives to a licensed waste disposal company.

Sources: University of South Alabama, College of Engineering. September 1992. "Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities." College of Engineering Report No. 92–2.

NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991 through December 31, 1992.
EPA, Office of Water. January 1993. "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters." 840–B–92–002.

4. Pollutant Control Measures Required Through Other EPA Programs

EPA recognizes that the Resource Conservation and Recovery Act (RCRA) and the Underground Storage Tank (UST) programs require careful management of materials used at Water Transportation Facilities and Boat Building & Repairing Facilities.

Under the RCRA program, on September 10, 1992, EPA promulgated standards in 40 CFR Part 279 for the management of used oils that are recycled (57 FR 41566). These standards include requirements for used oil generators, transporters, processors/re-refiners, and burners. The standards for used oil generators apply to all generators, regardless of the amount of used oil they generate. Do-it-yourself (DIY) generators which generate used oil from the maintenance of their personal vehicles, however, are not subject to the management standards (Section 279.20(a)(1)).

The requirements for used oil generators were designed to impose a minimal burden on generators while protecting human health and the environment from the risks associated with managing used oil. Under Subpart C of 40 CFR Part 279, used oil generators must not store used oil in units other than tanks, containers, or units subject to regulation under Part 264 or 265 of 40 CFR (Section 279.22(a)). In other words, generators may store used oil in tanks or containers that are not subject to Subpart J (Hazardous Waste Tanks) or Subpart I (Containers) of Parts 264/265, as long as such tanks or containers are maintained in compliance with the used oil management standards. This does not preclude generators from storing used oil in Subpart J tanks or Subpart I containers or other units, such as surface impoundments (Subpart K), that are subject to regulation under Part 264 or 265.

Storage units at generator facilities must be maintained in good condition and labeled with the words "used oil." Upon detection of a release of used oil to the environment, a generator must take steps to stop the release, contain the released used oil, and properly manage the released used oil and other materials (Section 279.22(b) to (d)). Generators storing used oil in underground storage tanks are subject to the UST regulations (40 CFR Part 280).

If used oil generators ship used oil offsite for recycling, they must use a transporter who has notified EPA and obtained an EPA identification number (Section 279.24).

The technical standards for USTs at 40 CFR Part 280 require that new UST systems (defined as systems for which installation commenced after December 12, 1988) use overfill prevention equipment that will: (1) Automatically shut off flow into the tank when the tank is no more than 95 percent full; or (2) alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high level alarm. The preceding requirements do no apply to systems that are filled by transfers of no more than 25 gallons at one time. Existing UST systems (defined as systems for which installation has commenced on or before December 12, 1988) are required to have installed the described overfill prevention equipment by December 12, 1998.

5. Special Conditions

a. Prohibition of Non-storm Water Discharges. In addition to the non-storm water discharges prohibited in part III.A of the permit, this section specifically prohibits the following: bilge and ballast water, pressure wash water, sanitary wastes, and cooling water originating from vessels are not authorized by this section. The operators of such discharges must obtain coverage under a separate NPDES permit if discharged to waters of the U.S. or through a municipal separate storm sewer system. Certain non-storm water discharges, however, may be authorized by this permit. Part III.A.2 of today's permit lists these discharges.

This section does not authorize the non-storm water discharge of pressure wash water. Pressure washing is used to remove marine growth from vessels. EPA has found that unpermitted releases of pressure wash water is a habitual problem at water transportation facilities. Marine growths and paint debris found in the wash water can contain significant quantities of heavy metals, and this water cannot be discharged.

6. Storm Water Pollution Prevention Plan Requirements

The conditions that apply to water transportation facilities with vehicle maintenance and/or equipment cleaning operations build upon the requirements set forth in the baseline conditions permit for storm water discharges from industrial activities discussed previously.

a. Contents of the Plan.

(1) Description of Potential Pollutant Sources.

Under the description of potential pollutant sources in the storm water pollution prevention plan requirements, permittees are required to include the location(s) on their facility site map where engine maintenance and repair work, vessel maintenance and repair work, and pressure washing are performed. This requirement is the same as the permit conditions listed in the front section of this factsheet, which are based on the baseline general permit of September 9, 1992 Here it is expressed in more appropriate terms for the water transportation industry. The baseline general permit includes "vehicle and equipment maintenance and/or cleaning areas." The language "processing areas", as described under the baseline general permit, has been specified to include painting, blasting, welding, and metal fabrication for this section. EPA believes that this specificity is appropriate for the water transportation industry and that these areas may potentially be a significant source of pollutants to storm water. Rather than requiring the location of "storage areas" as in the baseline general permit, this storm water pollution prevention plan specifies that the location of liquid storage areas (i.e., paint, solvents, resins) and material storage areas (i.e., blasting media, aluminum, steel) be shown. This again is the same requirement, but it is expressed in more specific terms for this industry. In addition, the site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

(2) Measures and Controls.

Under the description of measures and controls in the storm water pollution prevention plan requirements, this section requires that all areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. This section also requires that the following areas must be specifically addressed:

(a) Pressure Washing Area—When pressure washing is used to remove

marine growth from vessels, the discharge water must be permitted by an NPDES permit. The plan must describe the measures to collect or contain the discharge from the pressure washing area, detail the method for the removal of the visible solids, describe the method of disposal of the collected solids, and identify where the discharge will be released (i.e., the receiving waterbody, storm sewer system, sanitary sewer system).

(b) Blasting and Painting Areas—The facility must consider containing all blasting and painting activities to prevent abrasives, paint chips, and overspray from reaching the receiving water or the storm sewer system. The plan must describe measures taken at the facility to prevent or minimize the discharge of spent abrasive, paint chips, and paint into the receiving waterbody and storm sewer system. The facility may consider hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris. Where required, a schedule for cleaning storm systems to remove deposits of abrasive blasting debris and paint chips should be addressed within the plan. The plan should include any standard operating practices with regard to blasting and painting activities. Such included items may be the prohibition of performing uncontained blasting and painting over open water or blasting and painting during windy conditions which can render containment ineffective.

(3) Material Storage Areas—All stored and containerized materials (fuels, paints, solvents, waste oil, antifreeze, batteries) must be stored in a protected, secure location away from drains and plainly labeled. The plan must describe measures that prevent or minimize contamination of the storm water runoff from such storage areas. The facility must specify which materials are stored indoors and consider containment or enclosure for materials that are stored outdoors. Above ground storage tanks, drums, and barrels permanently stored outside must be delineated on the site map with a description of the containment measures in place to prevent leaks and spills. The facility must consider implementing an inventory control plan to prevent excessive purchasing, storage, and handling of potentially hazardous materials. Those facilities where abrasive blasting is performed must specifically include a discussion on the storage and disposal of spent abrasive materials generated at the facility.

(d) Engine Maintenance and Repair Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for engine maintenance and repair. The facility may consider performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluids prior to disposal, prohibiting the practice of hosing down the shop floor, using dry cleanup methods, and/or collecting the storm water runoff from the maintenance area and providing treatment or recycling.

(e) Material Handling Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from material handling operations and areas (i.e., fueling, paint & solvent mixing, disposal of process wastewater streams from vessels). The facility may consider covering fueling areas; using spill and overflow protection; mixing paints and solvents in a designated area, preferably indoors or under a shed; and minimizing runon of storm water to material handling areas. Where applicable, the plan must address the replacement or repair of leaking connections, valves, pipes, hoses, and soil chutes carrying wastewater from vessels.

(f) Drydock Activities—The plan must address the routine maintenance and cleaning of the drydock to minimize the potential for pollutants in the storm water runoff. The plan must describe the procedures for cleaning the accessible areas of the drydock prior to flooding and final cleanup after the vessel is removed and the dock is raised. Cleanup procedures for oil, grease, or fuel spills occurring on the drydock must also be included within the plan. The facility should consider items such as sweeping rather than hosing off debris and spent blasting material from the accessible areas of the drydock prior to flooding and having absorbent materials and oil containment booms readily available to contain and cleanup any spills.

(g) General Yard Area—The plan must include a schedule for routine yard maintenance and cleanup. Scrap metal, wood, plastic, miscellaneous trash, paper, glass, industrial scrap, insulation, welding rods, packaging, etc., must be routinely removed from the general yard area. The facility may consider such measures as providing covered trash receptacles in each yard, on each pier, and on board each vessel being repaired.

These seven areas are the common sources of pollutants in storm water runoff from water transportation facilities which have vehicle maintenance and/or equipment cleaning activities. Based upon the September 1992 "Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities" prepared by the College of Engineering at the University of South Alabama, the suggested management measures are commonly used at water transportation facilities. EPA believes that the incorporation of management practices such as those suggested will substantially reduce the potential that these activities and areas will significantly contribute to the pollution of storm water discharges. In addition, EPA believes that these requirements continue to provide the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with different facilities. Further, many facilities will find that management measures that they have already incorporated into the facility's operation, such as the installation of overfill protection equipment and labelling and maintenance of used oil storage units, that are already required under existing EPA programs will meet the requirements of this section.

Under the preventive maintenance requirements of the storm water pollution prevention plan elements, the plan specifically includes the routine inspection of sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system. Because of the nature of operations such as abrasive blasting which occur at water transportation facilities, specific routine attention needs to be placed on the collection and proper disposal of spent abrasive materials, paint chips, and other solids.

Under the inspection requirements of the storm water pollution prevention plan elements, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility, at a minimum, on a monthly basis. The following areas shall be included in all inspections: pressure washing area, blasting and painting areas, material storage areas, engine maintenance and repair areas, material handling areas, drydock area, and general yard area. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records shall be maintained.

The purpose of the inspections is to check on the implementation of the storm water pollution prevention plan. The inspections allow facility personnel to monitor the success or failure of elements of the plan on a regular basis. The use of an inspection checklist is highly encouraged. The checklist will ensure that all required areas are

inspected, as well as help to meet the record keeping requirements.

Under the employee training component of the storm water pollution prevention plan requirements, the permittee is required to identify at least annual (once per year) dates for such training. Employee training must, at a minimum address the following areas when applicable to a facility: used oil management; spent solvent management; proper disposal of spent abrasives; proper disposal of vessel wastewaters, spill prevention and control; fueling procedures; general good housekeeping practices; proper painting and blasting procedures; and used battery management. Employees, independent contractors, and customers must be informed about BMPs and be required to perform in accordance with these practices. The facility must consider posting easy to read descriptions or graphic depictions of BMPs and emergency phone numbers in the work areas. Unlike some industrial operations, the industrial activities associated with water transportation facilities that may affect storm water quality require the cooperation of all employees. EPA, therefore, is requiring that employee training take place at least once a year to serve as: (1) Training for new employees; (2) a refresher course for existing employees; (3) training for all employees on any storm water pollution prevention techniques recently incorporated into the plan; and (4) a forum for the facility to invite independent contractors and customers to inform them on pollution prevention procedures and requirements.

Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. Under the revised methodology for determining pollutants of concern for the various industrial sectors water transportation facilities must perform analytical monitoring. Facilities must collect and analyze samples of their storm water discharges for the pollutants listed in Table Q–4. The median levels of the pollutants listed in Table Q–4 were found to be above benchmark levels for water transportation facilities that submitted quantitative data in the group application process. EPA is requiring monitoring after the pollution prevention plan has been implemented to ensure that a reduction of pollutants is realized.

At a minimum, storm water discharges from water transportation facilities must be monitored quarterly during the second year of permit coverage. Samples must be collected at least once in each of the following periods: January through March; April through June; July through September; and October through December. At the end of the second year of permit coverage, a facility must calculate the average concentration for each parameter listed in Table Q–4. If the permittee collects more than four samples in this period, then they must calculate an average concentration for each pollutant of concern for all samples analyzed.

TABLE Q–4.—INDUSTRY MONITORING REQUIREMENTS

Pollutants of concern	Cut-off concentration
Total Recoverable Aluminum	0.75 mg/L.
Total Recoverable Iron	1.0 mg/L.
Total Recoverable Lead	0.0816 mg/L.
Total Recoverable Zinc	0.065 mg/L.

If the average concentration for a parameter is less than or equal to the value listed in Table Q–4, then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If, however, the average concentration for a parameter is greater than the cut-off concentration listed in Table Q–4, then the permittee is required to conduct quarterly monitoring for that parameter during the fourth year of permit coverage. Monitoring is not required during the first, third, and fifth year of the permit. The exclusion from monitoring in the fourth year of the permit is conditional on the facility maintaining industrial operations and BMPs that will ensure a quality of storm water discharges consistent with the average concentrations recorded during the second year of the permit. The schedule of monitoring is presented in Table Q–5.

TABLE Q–5.—SCHEDULE OF MONITORING

2nd Year of Permit Coverage	• Conduct quarterly monitoring. • Calculate the average concentration for all parameters analyzed during this period. • If average concentration is greater than the value listed in Table Q–5, then quarterly sampling is required during the fourth year of the permit. • If average concentration is less than or equal to the value listed in Table Q–5, then no further sampling is required for that parameter.
4th Year of Permit Coverage	• Conduct quarterly monitoring for any parameter where the average concentration in year 2 of the permit is greater than the value listed in Table Q–5. • If industrial activities or the pollution prevention plan have been altered such that storm water discharges may be adversely affected, quarterly monitoring is required for all parameters of concern.

In cases where the average concentration of a parameter exceeds the cut-off concentration, EPA expects permittees to place special emphasis on methods for reducing the presence of those parameters in storm water discharges. Quarterly monitoring in the fourth year of the permit will reassess the effectiveness of the adjusted pollution prevention plan.

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly chemical sampling.

b. Alternative Certification. Throughout today's permit, EPA has included monitoring requirements for facilities which the Agency believes have the potential for contributing significant levels of pollutants to storm water discharges. The alternative described below is necessary to ensure that monitoring requirements are only imposed on those facilities that do, in fact, have storm water discharges containing pollutants at concentrations of concern. EPA has determined

that if materials and activities are not exposed to storm water at the site, then the potential for pollutants to contaminate storm water discharges does not warrant monitoring.

Therefore, a discharger is not subject to the monitoring requirements of this Part provided the discharger makes a certification for a given outfall, on a pollutant-by-pollutant basis in lieu of monitoring reports required under paragraph *c* below under penalty of law, signed in accordance with Part VII.G. (Signatory Requirements), that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, significant materials from past industrial activity, that are located in areas of the facility that are within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan and submitted to EPA. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph (*c*) below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations. EPA does not expect facilities to be able to exercise this certification for indicator parameters, such as TSS and BOD.

c. Reporting Requirements. Permittees are required to submit all monitoring results obtained during the second and fourth year of permit coverage within 3 months of the conclusion of each year. For each outfall, one signed Discharge Monitoring Report Form must be submitted per storm event sampled. For facilities conducting monitoring beyond the minimum requirements an additional Discharge Monitoring Report Form must be filed for each analysis. The permittee must include a measurement or estimate of the total precipitation, volume of runoff, and peak flow rate of runoff for each storm event sampled.

d. Sample Type. All discharge data shall be reported for grab samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

e. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluent. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

f. Quarterly Visual Examination of Storm Water Quality. Quarterly visual examinations of storm water discharges from each outfall are required at water transportation facilities. The examination must be of a grab sample collected from each storm water outfall. The examination of storm water grab samples shall include any observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, or other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on these samples.

The examination must be made at least once in each of the designated periods during daylight unless there is insufficient rainfall or snow-melt to runoff. Where practicable, the same individual should carry out the collection and examination of discharges throughout the life of the permit to ensure the greatest degree of consistency possible. Grab samples shall be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 60 minutes) of when the runoff begins discharging. Reports of the visual examination include: the examination date and time, examination personnel, visual quality of the storm water discharge, and probable sources of any observed storm water contamination. The visual examination reports must be maintained onsite with the pollution prevention plan. The visual examination must be conducted in each of the following periods: January through March; April through June; July through September; and October through December.

When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain such documentation on-site with the results of the visual examinations. Adverse weather conditions which may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful

results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

R. Storm Water Discharges Associated With Industrial Activity From Ship and Boat Building or Repairing Yards

1. Discharges Covered Under This Section

The storm water application regulations define storm water discharges associated with industrial activity at 40 CFR 122.26(b)(14). Category (ii) of this definition includes facilities commonly identified by Standard Industrial Classification (SIC) codes 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, and 373. The conditions in this section apply to those facilities primarily engaged in ship and boat building and repairing services (SIC code 373). The following is a list of the types of facilities engaged in ship and boat building and repairing services:

a. Ship Building and Repairing (SIC code 3731)—These are establishments primarily engaged in building and repairing ships, barges, and lighters, whether self-propelled or towed by other crafts. The industry also includes the conversion and alteration of ships and the manufacture of off-shore oil and gas well drilling and production platforms (whether or not self-propelled). Examples include building and repairing of barges, cargo vessels, combat ships, crew boats, dredges, ferryboats, fishing vessels, lighthouse tenders, naval ships, offshore supply boats, passenger-cargo vessels, patrol boats, sailing vessels, towboats, trawlers, and tugboats.

b. Boat Building and Repairing (SIC code 3732)—These facilities are primarily engaged in building and repairing boats. Examples include building and repairing of fiberglass boats, motor-boats, sailboats, rowboats, canoes, dinghies, dories, small fishing boats, houseboats, kayaks, lifeboats, pontoons, and skiffs.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

2. Pollutants Found in Storm Water Discharges

Special conditions have been developed for boat and ship building and repairing operations. Common activities at ship and boat yards include: vessel and equipment cleaning fluid changes, mechanical repairs, parts cleaning, sanding, blasting, welding, refinishing, painting, fueling, and storage of the related materials and waste materials, such as oil, fuel, batteries, or oil filters. All of these areas are potential sources of pollutants to storm water discharges. Table R–1 lists pollutants associated with activities that commonly take place at Ship Building and Repairing Facilities (SIC 3731) and Boat Building and Repairing Facilities (SIC 3732).

TABLE R–1.—COMMON POLLUTANT SOURCES AT SHIP AND BOAT BUILDING AND REPAIRING FACILITIES

Activity	Pollutant source	Pollutant
Pressure Washing	Wash water	Paint solids, heavy metals, suspended solids.
Surface Preparation, Paint Removal, Sanding	Sanding; mechanical grinding; abrasive blasting; paint stripping.	Spent abrasives, paint solids, heavy metals, solvents, dust.
Painting	Paint and paint thinner spills; spray painting; paint stripping; sanding; paint cleanup.	Paint solids, spent solvents, heavy metals, dust.
Engine Maintenance and Repairs	Parts cleaning; waste disposal of greasy rags, used fluids, and batteries; use of cleaners and degreasers; fluid spills; fluid replacement.	Spent solvents, oil, heavy metals, ethylene glycol, acid/alkaline wastes, detergents.
Material Handling: Transfer Storage Disposal	Fueling: spills; leaks; and hosing area	Fuel, oil, heavy metals.
	Liquid Storage in Above Ground Storage: spills and overfills; external corrosion; failure of piping systems.	Fuel, oil, heavy metals, material being stored.
	Waste Material Storage and Disposal: paint solids; solvents; trash; spent abrasives, petroleum products.	Paint solids, heavy metals, spent solvents, oil.
Shipboard Processes improperly discharged to storm sewer or into receiving water.	Process and cooling water; sanitary waste; bilge and ballast water.	Biochemical oxygen demand (BOD), bacteria, suspended solids, oil, fuel.

Sources: Executive Office of the President, Office of Management and Budget, 1987. Standard Industrial Classification Manual 1987. National Technical Information Service Order no. PB 87–100012.

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EPA, Office of Water and Hazardous Materials. December 1979. "Draft Development Document for Proposed Effluent Limitations Guidelines and Standards for the Shipbuilding and Repair Industry." EPA/440/1–79/076-b.

University of South Alabama, College of Engineering. September 1992. "Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities." College of Engineering Report No. 92–2.

Based on the similarities of the facilities included in this sector in terms of industrial activities and significant materials, EPA believes it is appropriate to discuss the potential pollutants at ship and boat building and repairing facilities as a whole and not subdivide this sector. Therefore, Table R–2 lists data for selected parameters from facilities in the ship and boat building and repairing sector. These data include the eight pollutants that all facilities were required to monitor for under Form 2F, as well as the pollutants that EPA determined may merit further monitoring.

TABLE R–2.—STATISTICS FOR SELECTED POLLUTANTS REPORTED BY SHIP AND BOAT BUILDING OR REPAIRING YARDS SUBMITTING PART II SAMPLING DATA[i] (mg/L)

Pollutant Sample Type	No. of Facilities		No. of Samples		Mean		Minimum		Maximum		Median		95th Percentile		99th Percentile	
	Grab	Comp[ii]	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp	Grab	Comp
BOD_5	29	28	51	48	4.4	6.3	0.0	0.0	23.0	138.0	2.3	0.8	17.1	25.5	32.6	67.4
COD	29	28	51	49	73.2	70.0	0.0	0.0	450.0	810.0	53.0	33.0	259.1	264.3	503.9	579.8
Nitrate + Nitrite Nitrogen	29	28	51	49	0.79	0.82	0.00	0.00	6.00	5.00	0.72	0.71	2.36	2.35	4.28	4.22
Total Kjeldahl Nitrogen	29	28	51	49	1.19	2.20	0.00	0.00	3.40	48.00	1.00	0.97	2.57	4.69	3.73	8.67
Oil & Grease	29	N/A	52	N/A	1.0	N/A	0.0	N/A	14.0	N/A	0.0	N/A	5.1	N/A	15.9	N/A
pH	23	N/A	43	N/A	N/A	N/A	4.7	N/A	8.7	N/A	7.3	N/A	8.8	N/A	9.6	N/A
Total Phosphorus	29	28	51	48	0.21	0.86	0.00	0.00	2.20	32.00	0.00	0.06	0.94	1.75	1.98	4.51
Total Suspended Solids	29	27	51	48	92	45	0	0	1200	300	17	10	525	366	2294	1537

[i] Applications that did not report the units of measurement for the reported values of pollutants were not included in these statistics. Values reported as non-detect or below detection limit were assumed to be 0.
[ii] Composite samples.

3. Options for Controlling Pollutants

The measures commonly implemented to reduce pollutants in storm water discharges from boat and ship building and repairing facilities are generally uncomplicated and simple to implement. Table R–3 identifies Best Management Practices (BMPs) associated with various activities that routinely occur at boat and ship building and repair facilities.

TABLE R–3.—COMMON MANAGEMENT PRACTICES FOR STORM WATER POLLUTION PREVENTION AT SHIP AND BOAT BUILDING AND REPAIRING FACILITIES

Activity	BMPs
Pressure washing	Collect discharge water and remove all visible solids before discharging to a sewer system, or where permitted by an individual NPDES permit, to a drainage system, or receiving water.
	Perform pressure washing only in designated areas where wash water containment can be effectively achieved.
	Use no detergents or additives in the pressure wash water.
	Direct deck drainage to a collection system sump for settling and/or additional treatment.
	Implement diagonal trenches or berms and sumps to contain and collect wash water at marine railways.
	Use solid decking, gutters, and sumps at lift platforms to contain and collect wash water for possible reuse.
Surface preparation, sanding, and paint removal.	Enclose, cover, or contain blasting and sanding activities to the maximum extent practical to prevent abrasives, dust, and paint chips from reaching storm sewers or receiving water.
	Where feasible, cover drains, trenches, and drainage channels to prevent entry of blasting debris to the system.
	Prohibit uncontained blasting or sanding activities over open water.
	Prohibit blasting or sanding activities during windy conditions which render containment ineffective.
	Inspect and clean sediment traps to ensure the interception and retention of solids prior to entering the drainage system.
	Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding.
	Collect spent abrasives routinely and store under a cover to await proper disposal.
Painting	Enclose, cover, or contain painting activities to the maximum extent practical to prevent overspray from reaching the receiving water.
	Prohibit uncontained spray painting activities over open water.
	Prohibit spray painting activities during windy conditions which render containment ineffective.
	Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters, preferably indoors or under a shed.
	Have absorbent and other cleanup items readily available for immediate cleanup of spills.
	Allow empty paint cans to dry before disposal.
	Keep paint and paint thinner away from traffic areas to avoid spills.
	Recycle paint, paint thinner, and solvents.
	Train employees on proper painting and spraying techniques, and use effective spray equipment that delivers more paint to the target and less overspray.
Drydock maintenance	Clean and maintain drydock on a regular basis to minimize the potential for pollutants in the storm water runoff.
	Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding.

TABLE R–3.—COMMON MANAGEMENT PRACTICES FOR STORM WATER POLLUTION PREVENTION AT SHIP AND BOAT BUILDING AND REPAIRING FACILITIES—Continued

Activity	BMPs
	If hosing must be used as a removal method, collect wash water to remove solids and potential metals.
	Clean the remaining areas of the dock after a vessel has been removed and the dock raised.
	Remove and properly dispose of floatable and other low-density waste (wood, plastic, insulations, etc.).
Drydock activities	Use plastic barriers beneath the hull, between the hull and drydock walls for containment.
	Use plastic barriers hung from the flying bridge of the drydock, from the bow or stern of the vessel, or from temporary structures for containment.
	Weight the bottom edge of the containment tarpaulins or plastic sheeting during a light breeze.
	Use plywood and/or plastic sheeting to cover open areas between decks when sandblasting (scuppers, railings, freeing ports, ladders, and doorways).
	Install tie rings or cleats, cable suspension systems, or scaffolding to make implementation containment easier.
Nondrydock activities	Hang tarpaulin from the boat, fixed, or floating platforms to reduce pollutants transported by wind.
	Pave or tarp surfaces under marine railways.
	Clean railways before the incoming tide.
	Haul vessels beyond the high tide zone before work commences or halt work during high tide.
	Place plastic sheeting or tarpaulin underneath boats to contain and collect waste and spent materials and clean and sweep regularly to remove debris.
	Use fixed or floating platforms with appropriate plastic or tarpaulin barriers as work surfaces and for containment when work is performed on a vessel in the water to prevent blast material or paint overspray from contacting storm water or the receiving water.
	Sweep rather than hose debris present on the dock.
Engine maintenance and repairs	Maintain an organized inventory of materials used in the maintenance shop.
	Dispose of greasy rag, oil filters, air filters, batteries, spent coolant, and degreasers properly.
	Label and track the recycling of waste material (i.e., used oil, spent solvents, batteries).
	Drain oil filters before disposal or recycling.
	Store cracked batteries in a nonleaking secondary container.
	Promptly transfer used fluids to the proper container; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers.
	Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.
	Plug floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly.
	Inspect the maintenance area regularly for proper implementation of control measures.
	Train employees on proper waste control and disposal procedures.
Material Handling	Store permanent tanks in a paved area surrounded by a dike system which provides sufficient containment for the larger of either 10 percent of the volume of all containers or 110 percent of the volume of the largest tank.
Bulk liquid storage and containment	Maintain good integrity of all storage tanks.
	Inspect storage tanks to detect potential leaks and perform preventive maintenance.
	Inspect piping systems (pipes, pumps, flanges, couplings, hoses, valves) for failures or leaks.
	Train employees on proper filling and transfer procedures.
Material Handling	Store containerized materials (fuels, paints, solvents, etc.) in a protected, secure location and away from drains.
Containerized material storage	Store reactive, ignitable, or flammable liquids in compliance with the local fire code.
	Identify potentially hazardous materials, their characteristics, and use.
	Control excessive purchasing, storage, and handling of potentially hazardous materials.
	Keep records to identify quantity, receipt date, service life, users, and disposal routes.
	Secure and carefully monitor hazardous materials to prevent theft, vandalism, and misuse of materials.
	Educate personnel for proper storage, use, cleanup, and disposal of materials.
	Provide sufficient containment for outdoor storage areas for the larger of either 10 percent of the volume of all containers or 110 percent of the volume of the largest tank.
	Use temporary containment where required by portable drip pans.
	Use spill troughs for drums with taps.
Material Handling	Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters. Locate designated areas preferably indoors or under a shed.
Designated material mixing areas	If spills occur,
	Stop the source of the spill immediately.
	Contain the liquid until cleanup is complete.
	Deploy oil containment booms if the spill may reach the water.
	Cover the spill with absorbent material.
	Keep the area well ventilated.
	Dispose of cleanup materials properly.
	Do not use emulsifier or dispersant.
Shipboard process water handling	Keep process and cooling water used aboard ships separate from sanitary wastes to minimize disposal costs for the sanitary wastes.
	Keep process and cooling water from contact with spent abrasives and paint to avoid pollution of the receiving water.
	Inspect connecting hoses for leaks.

TABLE R-3.—COMMON MANAGEMENT PRACTICES FOR STORM WATER POLLUTION PREVENTION AT SHIP AND BOAT BUILDING AND REPAIRING FACILITIES—Continued

Activity	BMPs
Shipboard sanitary waste disposal	Discharge sanitary wastes from the ship being repaired to the yard's sanitary system or dispose of by a commercial waste disposal company.
	Use appropriate material transfer procedures, including spill prevention and containment activities.
Bilge and Ballast water	Collect and dispose of bilge and ballast waters which contain oils, solvents, detergents, or other additives to a licensed waste disposal company.

Sources: EPA, Office of Water. 1993. "Guidance Specifying Management Measures for Survey of Nonpoint Pollution in Coastal Waters." 840-B-92-002.
University of South Alabama, College of Engineering. September 1992. Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities. College of Engineering Report No. 92-2.
NPDES Storm Water Group Applications—Part 1. Received by EPA March 18, 1991 through December 31, 1992.

4. Pollutant Control Measures Required Through Other EPA Programs

EPA recognizes that the Resource Conservation and Recovery Act (RCRA) and the Underground Storage Tank (UST) programs require careful management of materials used at Ship Building and Repairing Facilities and Boat Building and Repairing Facilities.

Under the RCRA program, on September 10, 1992, EPA promulgated standards in 40 CFR Part 279 for the management of used oils that are recycled (57 FR 41566). These standards include requirements for used oil generators, transporters, processors/re-refiners, and burners. The standards for used oil generators apply to all generators, regardless of the amount of used oil they generate. Do-it-yourself (DIY) generators which generate used oil from the maintenance of their personal vehicles, however, are not subject to the management standards (Subsection 279.20(a)(1)).

The requirements for used oil generators were designed to impose minimal burden on generators while protecting human health and the environment from the risks associated with managing used oil. Under Subpart C of 40 CFR Part 279, used oil generators must not store used oil in units other than tanks, containers, or units subject to regulation under Part 264 or 265 of 40 CFR 279.22(a). In other words, generators may store used oil in tanks or containers that are not subject to Subpart J (Hazardous Waste Tanks) or Subpart I (Containers) of Parts 264/265, as long as such tanks or containers are maintained in compliance with the used oil management standards. This does not preclude generators from storing used oil in Subpart J tanks or Subpart I containers or other units, such as surface impoundments (Subpart K), that are subject to regulation under Part 264 or 265.

Storage units at generator facilities must be maintained in good condition and labeled with the words "used oil." Upon detection of a release of used oil to the environment, a generator must take steps to stop the release, contain the released used oil, and properly manage the released used oil and other materials (Sections 279.22(b)-(d)). Generators storing used oil in underground storage tanks are subject to the UST regulations (40 CFR Part 280).

If used oil generators ship used oil offsite for recycling, they must use a transporter who has notified EPA and obtained an EPA identification number (Section 279.24).

The technical standards for USTs at 40 CFR Part 280 require that new UST systems (defined as systems for which installation commenced after December 12, 1988) use overfill prevention equipment that will: (1) Automatically shut off flow into the tank when the tank is no more than 95 percent full; or (2) alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high level alarm. The preceding requirements do no apply to systems that are filled by transfers of no more than 25 gallons at one time. Existing UST systems (defined as systems for which installation has commenced on or before December 12, 1988) are required to have installed the described overfill prevention equipment by December 12, 1998.

5. Special Conditions

a. Prohibition of Non-storm Water Discharges. In addition to the prohibitions in part III.A., this section of today's permit does not authorize prohibited non-storm water discharges of wastewaters, such as bilge and ballast water, sanitary wastes, pressure washwater, and cooling water originating from vessels. The operators of such discharges must obtain coverage under a separate NPDES permit if discharged to waters of the U.S. or through a municipal separate storm sewer system. Part III.A.2 of today's permit does, however, authorize certain non-storm water discharges.

6. Storm Water Pollution Prevention Plan Requirements

The conditions that apply to ship and boat building and repairing facilities build upon the requirements set forth in the front of this fact sheet which are based on the requirements of the September 9, 1992 baseline general permit. The discussion which follows, therefore, only addresses conditions that differ from those baseline conditions.

a. Contents of the Plan

(1) Description of Potential Pollutant Sources. Under the description of potential pollutant sources in the storm water pollution prevention plan requirements, permittees are required to include the location(s) on their facility site map where engine maintenance and repair work, vessel maintenance and repair work, and pressure washing are performed. This requirement is the same as the baseline requirements presented in the front of this fact sheet, but here it is expressed in more appropriate terms for the ship and boat industry. Rather than requiring the location of "storage areas" as in the baseline general permit, this storm water pollution prevention plan specifies that the location of liquid storage areas (i.e., paint, solvents, resins) and material storage areas (i.e., blasting media, aluminum, steel) be shown. In addition, the site map must also indicate the outfall locations and the types of discharges contained in the drainage areas of the outfalls (e.g. storm water and air conditioner condensate). In order to increase the readability of the map, the inventory of the types of discharges contained in each outfall may be kept as an attachment to the site map.

(2) Measures and Controls. Under the description of measures and controls in the storm water pollution prevention plan requirements, this section requires

that all areas that may contribute pollutants to storm waters discharges shall be maintained in a clean and orderly manner. This section of today's permit also requires that the following areas be specifically addressed:

(a) Pressure Washing Area—When pressure washing is used to remove marine growth from vessels, the discharge water must be collected or contained and disposed of as required by the NPDES permit for this process water, if the discharge is to waters of the U.S. or through a municipal separate storm sewer. The plan must describe the measures to collect or contain the discharge from the pressure washing area, detail the method for the removal of the visible solids, describe the method of disposal of the collected solids, and identify where the discharge will be released (i.e., the receiving waterbody, storm sewer system, sanitary sewer system).

(b) Blasting and Painting Areas—The facility must consider containing all blasting and painting activities to prevent abrasives, paint chips, and overspray from reaching a receiving waterbody or storm sewer system. The plan must describe measures taken at the facility to prevent or minimize the discharge of spent abrasive, paint chips, and paint into the receiving waterbody and storm sewer system. The facility may consider hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris. Where appropriate, a schedule for cleaning storm water conveyances to remove deposits of abrasive blasting debris and paint chips should be addressed within the plan. The plan should include any standard operating practices with regard to blasting and painting activities. Such items may include the prohibition of performing uncontained blasting and painting over open water or blasting and painting during windy conditions which can render containment ineffective.

(c) Material Storage Areas—All stored and containerized materials (fuels, paints, solvents, waste oil, antifreeze, batteries) must be stored in a protected, secure location away from drains and plainly labeled. The plan must describe measures that prevent or minimize contamination of the storm water runoff from such storage areas. The facility must specify which materials are stored indoors and consider containment or cover for materials that are stored outdoors. Above ground storage tanks, drums, and barrels permanently stored outside must be delineated on the site map with a description of the containment measures in place to prevent leaks and spills. The facility must consider implementing an inventory control plan to prevent excessive purchasing, storage, and handling of potentially hazardous materials. Those facilities where abrasive blasting is performed must specifically include within the plan discussion on the storage and proper disposal of spent abrasive generated at the facility.

(d) Engine Maintenance and Repair Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from all areas used for engine maintenance and repair. The facility must consider performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluids prior to disposal, prohibiting the practice of hosing down the shop floor where the practice would result in the exposure of pollutants to storm water, using dry cleanup methods, and/or collecting the storm water runoff from the maintenance area and providing treatment or recycling.

(e) Material Handling Areas—The plan must describe measures that prevent or minimize contamination of the storm water runoff from material handling operations and areas (i.e., fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). The facility must consider covering fueling areas; using spill and overflow protection; mixing paints and solvents in a designated area, preferably indoors or under a shed; and minimizing runon of storm water to material handling areas. Where applicable, the plan must address the replacement or repair of leaking connections, valves, pipes, hoses, and soil chutes carrying wastewater from vessels.

(f) Drydock Activities—The plan must address the routine maintenance and cleaning of the drydock to minimize the potential for pollutants in storm water runoff. The facility must describe the procedures for cleaning the accessible areas of the drydock prior to flooding and the final cleanup after the vessel is removed and the dock is raised. Cleanup procedures for oil, grease, or fuel spills occurring on the drydock must also be included within the plan. The facility must consider items such as sweeping rather than hosing off debris and spent blasting material from the accessible areas of the drydock prior to flooding and having absorbent materials and oil containment booms readily available to contain and cleanup any spills.

(g) General Yard Area—The plan must include a schedule for routine yard maintenance and cleanup. Scrap metal, wood, plastic, miscellaneous trash, paper, glass, industrial scrap, insulation, welding rods, packaging, etc., must be routinely removed from the general yard area. The facility must consider such measures as providing covered trash receptacles in each yard, on each pier, and on board each vessel being repaired.

These seven areas are the common sources of pollutants in storm water from ship building and repairing and boat building and repairing activities. Based upon Best Management Practices for the Shipbuilding and Repair Industry and for Bridge Maintenance Activities prepared by the College of Engineering at the University of South Alabama, the suggested management measures are commonly used at ship and boat facilities. EPA believes that the incorporation of management practices such as those suggested will substantially reduce the potential for these activities and areas to contribute pollutants to storm water discharges. In addition, EPA believes that these requirements will continue to provide the necessary flexibility to address the variable risk for pollutants in storm water discharges associated with different facilities. Many facilities will find that appropriate management measures are already employed at the facility because they have been required under an existing EPA program.

The preventive maintenance requirements specifically include the routine inspection of sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system. Because of the nature of operations occurring at ship and boat facilities, routine attention needs to be placed on the collection and proper disposal of spent abrasive, paint chips, and other solids.

In addition to the comprehensive site evaluation required under Part XI.R.3.a.(4) of today's permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility, at a minimum, on a monthly basis. The following areas shall be included in all inspections: pressure washing areas, blasting and painting areas, material storage areas, engine maintenance and repair areas, material handling areas, drydock areas, and general yard areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records shall be maintained.

The purpose of the inspections is to check on the implementation and effectiveness of the storm water

pollution prevention plan. The inspections allow facility personnel to monitor the success or failure of elements of the plan on a regular basis. The use of an inspection checklist is encouraged. The checklist will ensure that all required areas are inspected, as well as help to meet the record keeping requirements.

The permittee is required to identify annual (once per year) dates for employee training. Employee training must, at a minimum address the following areas when applicable to a facility: used oil management; spent solvent management; proper disposal of spent abrasives; proper disposal of vessel wastewaters, spill prevention and control; fueling procedures; general good housekeeping practices; proper painting and blasting procedures; and used battery management. Employees, independent contractors, and customers must be informed about BMPs and be required to perform in accordance with these practices. The permittee is required to consider posting easy to read or graphic depictions of BMPs that are included in the plan as well as emergency phone numbers in the work areas. This practice will enhance employees understanding the pollutant control measures. Unlike some industrial operations, the industrial activities associated with ship and boat building and repair facilities that may affect storm water quality require the cooperation of all employees. EPA, therefore, is requiring that employee training take place at least once a year to serve as: (1) Training for new employees; (2) a refresher course for existing employees; (3) training for all employees on any storm water pollution prevention techniques recently incorporated into the plan; and (4) a forum for the facility to invite independent contractors and customers to inform them of pollution prevention procedures and requirements.

7. Numeric Effluent Limitation

There are no additional numeric effluent limitations beyond those described in Part V.B. of today's permit.

8. Monitoring and Reporting Requirements

a. Analytical Monitoring Requirements. Under the Storm Water Regulations at 40 CFR 122.26(b)(14), EPA defined "storm water discharge associated with industrial activity." The focus of today's permit is to address the presence of pollutants that are associated with the industrial activities identified in this definition and that might be found in storm water discharges. Under the methodology for determining analytical monitoring requirements, described in section VI.E.1 of this fact sheet, nitrate plus nitrite nitrogen is above the bench mark concentrations for the ship and boat building or repair yards sector. After a review of the nature of industrial activities and the significant materials exposed to storm water described by facilities in this sector, EPA has determined that the higher concentrations of nitrate plus nitrite nitrogen are not likely to be caused by the industrial activity, but may be primarily due to non-industrial activities on-site. Today's permit does not require ship and boat building or repair yards facilities to conduct analytical monitoring for this parameter. Therefore, under the revised methodology for determining pollutants of concern in the various industrial sectors, no analytical monitoring is required by ship and boat building and repairing facilities.

b. Quarterly Visual Examination of Storm Water Quality. Ship and boat building or repair yard facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted under paragraph (3) below. The examination(s) must be made at least once in each of the following 3-month periods: January through March, April through June, July through September, and October through December. The examination shall be made during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event.

(1) Examinations shall be made of grab samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

(2) Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

(3) When a facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the examination data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

(4) When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the records of the visual examinations. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

(5) EPA realizes that if a facility is inactive and unstaffed it may be difficult to collect storm water discharge samples when a qualifying event occurs. Today's final permit has been revised so that inactive, unstaffed facilities can exercise a waiver of the requirement to conduct quarterly visual examination.

EPA believes that this quick and simple assessment will allow the permittee to approximate the effectiveness of his/her plan on a regular basis at very little cost. Although the visual examination cannot assess the

chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly. The frequency of this visual examination will also allow for timely adjustments to be made to the plan. If BMPs are performing ineffectively, corrective action must be implemented. A set of tracking or follow-up procedures must be used to ensure that appropriate actions are taken in response to the examinations. The visual examination is intended to be performed by members of the pollution prevention team. This hands-on examination will enhance the staff's understanding of the storm water problems on that site and the effects of the management practices that are included in the plan.

S. Storm Water Discharges Associated With Industrial Activity From Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities

1. Discharges Covered Under This Section

The conditions in this section apply to airports, airport terminals, airline carriers, and establishments engaged in servicing, repairing, or maintaining aircraft and ground vehicles, equipment cleaning and maintenance (including vehicle and equipment rehabilitation mechanical repairs, painting, fueling, lubrication) or deicing/anti-icing operations which conduct the above described activities (facilities generally classified as SIC code 45). For the purpose of this final permit, the term "deicing" is defined as the process to remove frost, snow, or ice and "anti-icing" is the process which prevents the accumulation of frost, snow, or ice. Both of these activities are covered under this permit.

When an industrial facility, described by the above coverage provisions of this section, has industrial activities being conducted onsite that meet the description(s) of industrial activities in another section(s), that industrial facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to all applicable requirements in this section. The monitoring and pollution prevention plan terms and conditions of this multi-sector permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which other monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

a. Responsible Parties. Airports typically operate under a single management organization known as the airport "authority" which in most cases is a public agency. Airline carriers and other fixed base operators (e.g., fueling companies and maintenance shops) that have contracts with the airport authority to conduct business on airport property are commonly referred to as "tenants" of the airport. Tenants may be of two types—those that are regulated as storm water dischargers associated with industrial activities under 40 CFR 122.26(b)(14) and those that are not. The operator and the tenants of the airport that conduct industrial activities as described above, or as described anywhere in 40 CFR 122.26(b)(14) and which have storm water discharges, are required to apply for coverage under an NPDES storm water permit for the discharges from their areas of operation. Where an airport has multiple operators (airport authority and tenants) that have storm water discharges associated with industrial activity, as described above, each operator is required to apply for coverage under an NPDES storm water permit. This may be done as separate operators or may be done as co-permittees. Regardless, each individual party, whether a co-permittee or a separate permittee, must submit a notice of intent (NOI) to be covered under today's permit. During implementation of the storm water pollution prevention plan, the airport authority should work cooperatively with tenants that are not required to have a NPDES permit for their storm water discharges. The airport authority may accomplish this through negotiated agreements, contractual requirements, or other means. Ultimately, the operator(s)/owner(s) (the airport authority) of the storm water outfalls from the airport is(are) responsible for compliance with all terms and conditions of this or other NPDES permits applicable to those outfalls. Storm water pollution prevention plans developed separately for areas of the airport facility occupied by tenants of the airport that are regulated under 40 CFR 122.26(b)(14) as a storm water discharge associated with industrial activity shall be integrated into the storm water pollution prevention plan for the entire airport facility.

The airport authority and tenants of the airport are encouraged to apply as co-permittees under today's permit, and to work in partnership in the development and implementation of a storm water pollution prevention plan.

2. Pollutants Found in Storm Water Discharges

In general, the quantitative data submitted thus far has not raised any particular areas of concern with respect to discharges of pollutants resulting from vehicle maintenance and/or deicing/anti-icing operations conducted at airport facilities. However, EPA believes that the part 2 sampling data does not provide justification that discharges resulting from deicing/anti-icing operations are not a significant source of pollutants. The sampling requirements for part 2 of the group application did not specify that facilities must sample storm water discharges from areas where deicing/anti-icing activities occur and/or during times when such operations were being conducted. As a result, only one facility indicated that the sampling data submitted was collected from areas where deicing activities were being conducted. After reviewing recent case studies on the effects of glycol discharges to receiving waters, EPA reports and the results of FAA surveys, EPA believes that additional information on the discharges of deicing/anti-icing chemicals to receiving waters as a result of aircraft and runway deicing/anti-icing operations is warranted and necessary.

Both ethylene and propylene glycols exert high oxygen demands when released into receiving waters. As such, this section requires that facilities report both the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) of discharges sampled at facilities that use at least 100,000 gallons or more of glycol-based deicing/anti-icing chemicals. The concentration of nitrogen and possibly ammonia are the concern with respect to deicing/anti-icing operations where urea is used. Therefore, this section requires that facilities subject to the monitoring requirements in Part XI.S.5. of the permit also report the concentration of Total Kjeldahl Nitrogen (TKN) in discharges sampled.

The results of the storm water survey conducted by the FAA (June 1992) showed that 10 percent of the respondents who conduct deicing/anti-icing activities used more than 100,000 gallons of glycol-based deicing/anti-icing chemicals during winter seasons. In addition, those facilities using more than 100,000 gallons of glycol-based deicing/anti-icing chemicals accounted for 71 percent of the total amount of glycol-based deicing/anti-icing chemicals reported in the survey. In a similar survey conducted by the American Association of Airport

Executives, 4 percent of the airports conducting deicing/anti-icing activities used more than 100,000 gallons of ethylene glycol which represented approximately 76 percent of the total amount of ethylene glycol used by all airports surveyed.

3. Special Conditions

a. Prohibition of Non-storm Water Discharges. In addition to the non-storm water prohibitions described under Part III.A.2, today's permit clarifies in Part XI.S.2.a (Prohibition of Non-storm Water Discharges) that non-storm water discharges, including discharges from aircraft, ground vehicle and equipment washwaters, dry weather discharges from airport deicing/anti-icing operations, and dry weather discharges resulting from runway maintenance are not authorized under this permit. Dry weather discharges are generated from processes other than those described in the definition of storm water. The definition of storm water includes storm water runoff, snow melt runoff, and surface runoff and drainage. There is no limit on the time between the snowfall and snow melt for the purpose of including a snow melt discharge in the definition of storm water. All other discharges not included in the definition of storm water constitute non-storm water discharges. Operators of non-storm water discharges must obtain coverage under a separate NPDES wastewater permit if such discharges are a point source discharge to waters of the U.S. or are discharged through a municipal separate storm sewer system. In a related requirement, the permittee is required to attach a copy of the NPDES permit issued for the discharge of non-storm water runoff or, if an NPDES permit has not yet been issued, a copy of the pending application to the plan. For facilities that discharge the waters mentioned above to a sanitary sewer system, the operator of the sanitary sewer system must be notified. A copy of the notification letter must be attached to the plan. If an industrial user permit has been issued under a pretreatment program, a copy of the permit must be attached to the plan as does any other permit to which the facility's discharge waters are subject. This will help to prevent confusion and help to ensure that non-storm water discharges are not inadvertently authorized by this permit.

b. Releases of Reportable Quantities of Hazardous Substances and Oil. Today's permit clarifies in Part XI.S.2.b (Releases of Reportable Quantities of Hazardous Substances and Oil) that each individual permittee is required to report spills equal to or exceeding the RQ levels specified at 40 CFR 110, 117 and 302. If the airport authority is the sole permittee, then the sum total of all spills at the airport must be assessed against the RQ. If the airport authority is a co-permittee with other deicing/anti-icing operators at the airport, such as numerous different airlines, the assessed amount must be the summation of spills by each co-permittee. If separate, distinct individual permittees exist at the airport, then the amount spilled by each separate permittee must be the assessed amount for the RQ determination.

4. Storm Water Pollution Prevention Plan Requirements

a. Contents of the Plan. The pollution prevention plan requirements described below are in addition to those found under Part VI.C.

(1) Description of Potential Pollutant Sources. In addition to the common pollution prevention plan requirements discussed in Part VI.C.2.a. (Drainage), the site map developed for an entire airport shall identify the location of each tenant of the facility describe their activities.

In addition to the pollution prevention requirements discussed in Part VI.C.2. (Description of Potential Pollutant Sources), airport facilities, including areas operated by tenants of the facility that conduct industrial activities, must address the following specific operations and areas where the operations occur:

Aircraft Deicing/Anti-icing—Includes both deicing to remove frost, snow or ice, and anti-icing which prevents the accumulation of frost, snow or ice. Deicing/anti-icing of an airplane is accomplished through the application of a freezing point depressant fluid, commonly ethylene glycol or propylene glycol, to the exterior surface of an aircraft. Both ethylene and propylene glycol have high biochemical oxygen demands (BOD) when discharged to receiving waters. Environmental impacts on surface waters due to glycol discharges includes glycol odors and glycol contaminated surface water and ground water systems, diminished dissolved oxygen levels and fish kills.

The Federal Aviation Administration (FAA) recently conducted a survey which focused on aircraft and runway deicing/anti-icing operations at U.S. airports. Ninety-six airports responded to the survey and results are summarized in a final report dated June 1, 1992. In summary, 65 airports indicated the amounts of ethylene glycol used for aircraft deicing for the winter periods of 1989–90 and 1990–91 and the volumes used by each airport ranged significantly, from a few gallons to 520,000 gallons. The average annual volume of ethylene glycol used by all respondents for the winter periods of 1989–90 and 1990–91 was approximately 2.16 million gallons.

The FAA survey summary reported that the majority of aircraft deicing operations occur on the apron adjacent to the passenger terminal and runoff generally drains to a nearby storm water inlet. In fact, 31 of the respondents to the FAA survey indicated that 75 percent or more of the spent deicing chemicals were discharged to a storm sewer system. In general, the remainder of spent chemical resulting from aircraft deicing operations drained to ditches or open areas.

All aspects of aircraft deicing/anti-icing operations, including quantities used and stored, as well as application, handling and storage procedures are required to be addressed under the conditions of this section.

(b) Runway Deicing/Anti-icing—Includes both deicing and anti-icing operations conducted on runways, taxiways and ramps. Runway deicing/anti-icing commonly involves either the application of chemical fluids such as ethylene glycol or solid constituents such as pelletized urea. Urea has a high nitrogen content, therefore degradation of urea in a receiving water causes an increase in nutrient loadings resulting in an accelerated growth of algae and eutrophic conditions. Under certain ambient conditions, the degradation of urea in receiving waters can also result in ammonia concentrations toxic to aquatic life.

The FAA's storm water survey reported that, of the facilities that indicated using urea for runway deicing/anti-icing for the winter periods of 1989–90 and 1990–91, the amount of urea used during a single winter period ranged from 100 pounds to 1,450,000 pounds (715 tons). With regard to disposal of spent deicing/anti-icing chemicals from runways, taxiways and ramps, 20 airports indicated that they discharged 50 percent or more of runoff from deicing areas directly to a storm sewer system. In response to questions concerning collection and treatment of spent deicing chemicals from runway deicing/anti-icing activities, only five facilities indicated that runoff from runway deicing/anti-icing operations was collected and treated.

All aspects of runway deicing/anti-icing operations, including types of deicing/anti-icing chemicals, quantities used and stored, as well as application, handling and storage procedures are required to be addressed under the conditions of this section.

(c) Aircraft Servicing—Typically conducted on the apron area adjacent to the passenger terminal, the servicing of aircraft could potentially contribute pollutants to storm water. As a result of spills or leaks during the servicing of aircraft, fluids such as engine oil, hydraulic fluid, fuel and lavatory waste could potentially enter the storm water system and/or be discharged to receiving waters. All spillage other than potable water should be prevented from entering the storm sewer system.

(d) Aircraft, Ground Vehicle and Equipment Maintenance and Washing—Maintenance activities included in this section include both minor and major operations conducted either on the apron adjacent to the passenger terminal, or at dedicated maintenance facilities. Potential pollutant sources from all types of maintenance activities include spills and leaks of engine oils, hydraulic fluids, transmission oil, radiator fluids, and chemical solvents used for parts cleaning. In addition, the disposal of waste parts, batteries, oil and fuel filters, and oily rags also have a potential for contaminating storm water runoff from maintenance areas unless proper management practices and operating procedures are implemented. The spent wash water from aircraft and ground vehicle washing activities could potentially be contaminated with surface dirt, metals, and fluids (fuel, hydraulic fluid, oil, lavatory waste).

(e) Runway Maintenance—Over time, materials such as tire rubber, oil and grease, paint chips, and jet fuel can build up on the surface of a runway causing a reduction in the friction of the pavement surface. When the friction level of a runway falls below a specific level, then maintenance must be performed. The Federal Aviation Administration (FAA) recommends several methods for removing rubber deposits and other contaminants from a runway surface including high pressure water, chemical solvents, high velocity particle impact, and mechanical grinding. If not properly managed, the materials removed from the runway surface could be discharged into nearby surface waters. Similarly, if chemical solvents are used in the maintenance operation, improper management practices could result in discharges of the chemical solvents in the storm water runoff from runway areas to nearby surface waters.

(2) Measures and Controls. In addition to the common pollution prevention plan requirements discussed in Part VI.C.3. (Measures and Controls), this section specifies that permittees must address particular Best Management Practices (BMP) for specific areas and operations identified as potential sources of pollutants. This section further specifies that a schedule for implementation shall be provided for each BMP selected. The BMPs specified in this section are not intended to be the only alternative management practices considered by operators, simply the minimum to be considered. In most cases, the BMPs specified are common sense approaches that are already in practice at many airport facilities. As such, operators may only need to include the information in their storm water pollution prevention plan. Specific areas and industrial operations mentioned in this section and the corresponding BMPs for such areas are the following:

(a) Aircraft, Ground Vehicle and Equipment Maintenance Areas (including aircraft service areas)—The plan must describe measures that prevent or minimize the contamination of storm water runoff from all areas used for aircraft, ground vehicle and equipment maintenance and servicing. Management practices such as performing all maintenance activities indoors, maintaining an organized inventory of materials used, draining all parts of fluids prior to disposal, prohibiting the practice of hosing down the apron or hangar floor, using dry cleanup methods in the event of spills, and/or collecting the storm water runoff from maintenance and/or service areas and providing treatment, or recycling should be considered.

(b) Aircraft, Ground Vehicle, and Equipment Cleaning Areas—The plan must describe measures that prevent or minimize the contamination of the storm water runoff from all areas used for aircraft, ground vehicle, and equipment maintenance. Management practices such as performing all cleaning operations indoors, and/or collecting the storm water runoff from the area and providing treatment or recycling should be considered.

(c) Aircraft, Ground Vehicle, and Equipment Storage Areas—The storage of aircraft, ground vehicles, and equipment awaiting maintenance must be confined to designated areas (delineated on the site map). The plan must describe measures that prevent or minimize the contamination of storm water runoff from these areas. Management practices such as indoor storage of aircraft and ground vehicles, the use of drip pans for the collection of fluid leaks, and perimeter drains, dikes or berms surrounding storage areas should be considered.

(d) Material Storage Areas—Storage units of all materials (e.g., used oils, hydraulic fluids, spent solvents and waste aircraft fuel) must be maintained in good condition, so as to prevent contamination of storm water, and plainly labeled (e.g., "used oil," "Contaminated Jet-A," etc.). The plan must describe measures that prevent or minimize contamination of the storm water runoff from storage areas. Management practices such as indoor storage of materials, centralized storage areas for waste materials, and/or installation of berms and dikes around storage areas should be considered for implementation.

(e) Airport Fuel System and Fueling Areas—The plan must describe measures that prevent or minimize the discharge of fuels to the storm sewer resulting from fuel servicing activities or other operations conducted in support of the airport fuel system. Where the discharge of fuels into the storm sewer cannot be prevented, the plan shall indicate measures that will be employed to prevent or minimize the discharge of the contaminated runoff into receiving surface waters.

Where above ground storage timers are present, pollution prevention plan requirements shall be consistent with requirements established in 40 CFR 112.7 guidelines for the preparation and implementation of a spill prevention control and countermeasure (SPCC) plan. Where a SPCC plan already exists, the storm water pollution prevention plan may incorporate requirements into the PPP by reference.

(f) Source Reduction—This section specifies that facilities which conduct aircraft and/or runway (including taxiways and ramps) deicing/anti-icing operations shall evaluate present operating procedures to consider alternative practices which would reduce the overall amount of deicing/anti-icing chemical used and/or lessen the environmental impact of the pollutant source.

With regard to runway deicing operations, operators should begin by evaluating present chemical application rates to ensure against excessive over application. Devices which meter the amount of chemical being applied to runways help to prevent over application. Operators should also emphasize anti-icing operations which would preclude the need to deice; less chemical is required to prevent the formation of ice on a runway than is required to remove ice from a runway. To further assist in implementing anti-icing procedures, operators should also consider installing runway ice detection systems (RID) otherwise known as "pavement sensors" which monitor runway temperatures. Pavement sensors provide an indication of when runway

temperatures are approaching freezing conditions, thus alerting operators of the need to conduct anti-icing operations. Deicing/anti-icing chemicals applied during extremely cold, dry conditions, are often ineffective since they do not adhere to the ice surface and may be scattered as a result of windy conditions or aircraft movement. In an effort to improve the efficiency of the application, operators should consider pre-wetting the deicing chemical to improve the adhesion to the iced surface.

With regard to substitute deicing/ chemicals for runway use, operators should consider using chemicals which have less of an environmental impact on receiving waters. Potassium acetate, has a lower oxygen demand than glycol, is nontoxic to aquatic habitat or humans, and was approved by the FAA for runway deicing operations in November, 1991 (AC No. 150/5200–30A CHG 1).

In considering alternative management practices for aircraft deicing/ operations, operators should evaluate present application rates to ensure against excessive over application. In addition, operators may consider pretreating aircraft with hot water or forced air prior to the application of chemical deicer. The goal of this management practice is to reduce the amount of chemical deicer used during the operation. This management practice alone is not sufficient since discharges of small concentrations of glycol can have significant effects on receiving waters. It is, however, an effective measure to reduce the amount of glycol needed per operation.

(g) Management of Runoff—A number of reports including EPA's Guidance For Issuing NPDES Storm Water Permits For Airports, September 28, 1991 and Federal Aviation Administration (FAA) Advisory Circular (AC 150–5320–15) indicate that the most common location for deicing/anti-icing aircraft at U.S. airports is along the apron areas where mobile deicing vehicles operate from gate to gate. In a recent FAA survey of deicing/anti-icing operations at U.S. airports (June 1992), the majority of respondents indicated that spent deicer chemicals from aircraft deicing/anti-icing operations either drain to the storm sewer system, open areas, or are left to evaporate on the ramp.

This section specifies that operators shall provide a narrative description of BMPs to control or manage storm water runoff from areas where deicing/anti-icing operations occur in an effort to minimize or reduce the amount of pollutants being discharged from the site. For example, when deicing/anti-icing operations are conducted on aircraft during periods of dry weather, operators should ensure that storm water inlets are blocked to prevent the discharge of deicing/anti-icing chemicals to the storm sewer system. Mechanical vacuum systems or other similar devices can then be used to collect the spent deicing chemical from the apron surface for proper disposal to prevent those materials from later becoming a source of storm water contamination. Establishing a centralized deicing station would also provide better control over aircraft deicing/anti-icing operations in that it enables operators to readily collect spent deicing/anti-icing chemicals.

Once spent deicer/anti-icer chemicals are collected, operators can then select from various methods of disposal such as:

(i) Disposal to Sanitary Sewage Facility—Because glycols are readily biodegradable, runoff can be treated along with sanitary sewage. The receiving treatment plant would, however, have to have the capacity to handle the hydraulic load as well as the additional biochemical oxygen demand associated with the deicing/anti-icing chemical. Measurements have shown that the average oxygen demand for glycol is between 400,000 and 600,000 mg O2/L even if diluted per fluid manufacturers specifications (FAA AC 150–5320–15 CHG 1, 1991). To lessen both the increased hydraulic and pollutant loads due to runoff from airport deicing/anti-icing operations, retention basins may be located at the airport facility.

(ii) Retention and Detention Ponds—Conversion of suitable unused airport land into retention or detention basins allows for collection of large volumes of glycol waste from pavement surface runoff. The design capacity for such basins should at least handle surface runoffs for winter months noting the decreased microbial activity during the winter season which is needed for biodegradation, plus additional capacity for runoff during thawing periods. Continuous aeration would supply required oxygen and allow for faster biodegradation and release of glycol waste, which may reduce capacity requirements. Metering the discharge of flow from an onsite basin allows the operator to better control the rate of flow during peak flight hours and to avoid BOD shock loadings to a sanitary treatment facility or a surface water.

(iii) Recycling—Glycol recycling provides operators with a chemical cost savings since recaptured glycol can be sold or reused for other non-aircraft applications (FAA AC 150–5320–15, February 1991). Studies indicate that collected deicing chemicals which have glycol concentrations ranging from 15 to 25 percent can be cost effectively recycled. The optimal conditions for collecting the highest concentration of glycol in spent deicing fluid is directly from the apron or centralized deicing station when deicing operations are conducted during dry weather or light precipitation events. Deicing/anti-icing chemicals discharged to retention basins which are then allowed to mix with additional surface runoff typically result in glycol concentrations well below the acceptable range for recycling. There are, however, methods of physical separation presently available which increase the concentration of glycol and allow operators to recover a relatively reusable product.

(h) Inspections—In addition to the common pollution prevention plan requirements discussed in Part VI.C.3.d (Inspections), qualified personnel shall inspect equipment and areas involved in deicing/anti-icing operations on a weekly basis during periods when deicing/anti-icing operations are being conducted.

(i) Pollution Prevention Training—Pollution Prevention training programs shall inform management and personnel responsible for implementing activities identified in the storm water pollution prevention plan of the components and goals of the plan. Training should address topics such as spill response, good housekeeping, material management practices and deicing/anti-icing procedures. The pollution prevention plan shall identify periodic dates for such training. EPA recommends that facilities conduct training annually at a minimum. However, more frequent training may be necessary at facilities with high turnover of employees or where employee participation is essential to the storm water pollution prevention plan.

(3) Comprehensive Site Compliance Evaluation. The storm water pollution prevention plan must describe the scope and content of comprehensive site evaluation that qualified personnel will conduct to: (1) Confirm the accuracy of the description of potential pollution sources contained in the plan, (2) determine the effectiveness of the plan, and (3) assess compliance with the terms and conditions of the permit. Comprehensive site compliance evaluations must be conducted at least annually. The individual or individuals who will conduct the evaluations must be identified in the plan and should be members of the pollution prevention team. Evaluation reports must be

retained for a period of at least 3 years following the date of evaluation.

Based on the results of each evaluation, the description of potential pollution sources, and measures and controls, the plan must be revised as appropriate within 2 weeks after each inspection. Changes in the measures and controls must be implemented on the site in a timely manner, and no later than 12 weeks after completion of the inspection.

5. Numeric Effluent Limitation

There are no additional numerical limitations beyond those in Part V.B. of this permit.

6. Monitoring and Reporting Requirements

In general, the quantitative data submitted with part 2 of the group application was inadequate to clearly identify particular areas of concern with respect to discharges of pollutants resulting from vehicle maintenance and/or deicing/anti-icing operations conducted at airport facilities. EPA believes that the part 2 sampling data does not provide justification that discharges resulting from deicing/anti-icing operations are not a significant source of pollutants. The sampling requirements for part 2 of the group application did not specify that facilities must sample storm water discharges from areas where deicing/anti-icing activities occur and/or during times when such operations were being conducted. As a result, only one facility indicated that the sampling data submitted was collected from areas where deicing/anti-icing activities were being conducted. After reviewing recent case studies on the effects of glycol discharges to receiving waters, EPA reports, and the results of FAA surveys, EPA believes that additional information on the impacts of discharges of deicing/anti-icing chemicals to receiving waters resulting from aircraft and runway deicing/anti-icing operations is warranted and necessary.

Both ethylene and propylene glycols exert high oxygen demands when released into receiving waters. As such, this section requires that facilities report both the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) of discharges sampled at facilities that use at least 100,000 gallons or more of glycol-based deicing/anti-icing chemicals. The concentration of nitrogen and possibly ammonia are the concern with respect to deicing/anti-icing operations where urea is used. Therefore, this section requires that facilities subject to the monitoring requirements in Part XI.S.5. of the permit also report the concentration of Total Kjeldahl Nitrogen (TKN) in discharges sampled.

The results of the storm water survey conducted by FAA (June 1992) showed that 10 percent of the respondents who conduct deicing activities used more than 100,000 gallons of glycol-based deicing chemicals during winter seasons. In addition, those facilities using more than 100,000 gallons of glycol-based deicing chemicals accounted for 71 percent of the total amount of glycol-based deiced chemicals reported by all respondents in the survey. In a similar survey conducted by the American Association of Airport Executives, 4 percent of the airports conducting deicing activities used more than 100,000 gallons of ethylene glycol which represented approximately 76 percent of the total amount of ethylene glycol used by all airports surveyed.

a. Annual Loading Estimates. All facilities that use more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis shall prepare estimates of annual pollutant loadings resulting from discharges of spent deicing/anti-icing chemicals from the facility. The loading estimates shall reflect the amounts of deicing/anti-icing chemicals discharged to separate storm sewer systems or surface waters, prior to and after implementation of the facility's storm water pollution prevention plan. The purpose of these estimates is to calculate the net reduction in deicing/anti-icing chemical loadings to receiving streams. Such estimates shall be reviewed and certified by an environmental professional (engineer, scientist, etc.) with experience in storm water pollution prevention. The environmental professional need not be certified or registered, however, experience with development of storm water pollution prevention plans and with airport operations is critical to prepare accurate estimates. By means of the certification, the environmental professional, having examined the facility's deicing/anti-icing procedures and proposed control measures described in the storm water pollution prevention plan, shall attest that the loading estimates have been accurately prepared.

b. Analytical Monitoring Requirements. EPA believes that airports may reduce the level of pollutants in storm water runoff from their sites through the development and proper implementation of the storm water pollution prevention plan requirements discussed in today's permit. In order to provide a tool for evaluating the effectiveness of the pollution prevention plan and to characterize the discharge for potential environmental impacts, the permit requires airport facilities that use 100,000 gallons or more of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis to collect and analyze samples of their storm water discharges from areas where deicing/anti-icing activities occur for the pollutants listed in Table S–1. Airport facilities which use less than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or less than 100 tons of urea on an average annual basis are not required to monitor discharges resulting from deicing/anti-icing activities.

In determining if an airport is subject to the monitoring requirements, airport authorities must determine the "average annual usage rate" of deicing/anti-icing chemicals at their particular facility. The "average annual usage rate" is determined by averaging the total amounts of deicing/anti-icing chemicals used at the facility for the three previous calendar years. The total amount of deicing/anti-icing chemicals used at an airport facility is the cumulative amount used by the airport authority and each tenant of the airport facility. EPA recognizes that glycol-based deicing/anti-icing chemicals are often diluted with water prior to deicing aircraft. In some cases, deicing/anti-icing chemicals may constitute only 50 percent of the applied volume of liquid to aircraft. Therefore, in determining the fluid amounts of deicing/anti-icing chemicals used at a facility, operators should use the pre-dilution volume.

At a minimum, storm water discharges from airport facilities that use 100,000 gallons or more of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average basis must be monitored four times during the second year of permit coverage when deicing/anti-icing activities are occurring and from outfalls that receive storm water runoff from those areas. At the end of the second year of permit coverage, a facility must calculate the average concentration for all grab samples analyzed for each parameter listed in Table S–1 on an outfall-by-outfall basis. If more than four different events are sampled during a monitoring period, then the average concentration for each parameter shall be determined using all grab samples analyzed.