

INDUSTRIAL STORMWATER

FACT SHEET SERIES

Sector K: Hazardous Waste Treatment, Storage, or Disposal Facilities



U.S. EPA Office of Water
EPA-833-F-06-026
February 2021

What is the NPDES stormwater program for industrial activity?

Activities, such as material handling and storage, equipment maintenance and cleaning, industrial processing or other operations that occur at industrial facilities are often exposed to stormwater. The runoff from these areas may discharge pollutants directly into nearby waterbodies or indirectly via storm sewer systems, thereby degrading water quality.

In 1990, the U.S. Environmental Protection Agency (EPA) developed permitting regulations under the National Pollutant Discharge Elimination System (NPDES) to control stormwater discharges associated with eleven categories of industrial activity. As a result, NPDES permitting authorities, which may be either EPA or a state environmental agency, issue stormwater permits to control runoff from these industrial facilities.

What types of industrial facilities are required to obtain permit coverage?

This fact sheet specifically discusses stormwater discharges from hazardous waste treatment, storage, or disposal facilities (TSDF), including those that are operating under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA). Some industrial facilities that generate hazardous waste have on-site capacity to store, treat, and even dispose of their waste. Many hazardous waste generators, however, send their waste offsite to a TSDF.

What does an industrial stormwater permit require?

Common requirements for coverage under an industrial stormwater permit include development of a written stormwater pollution prevention plan (SWPPP), implementation of control measures, and submittal of a request for permit coverage, usually referred to as the Notice of Intent or NOI. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at your facility to minimize the discharge of these pollutants in runoff from the site. These control measures include site-specific best management practices (BMPs), maintenance plans, inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site. The industrial stormwater permit also requires collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of implemented BMPs. For more information on EPA's industrial stormwater permit and links to State stormwater permits, go to www.epa.gov/npdes/stormwater and click on "Industrial Activity."

What pollutants are associated with activities at my facility?

Pollutants conveyed in stormwater discharges from facilities involved with the storage, treatment and disposal of hazardous waste will vary given the diversity and quantity of hazardous waste handled at TSDFs. There are a number of factors that influence to what extent industrial activities and significant materials can affect water quality. TSDFs regulated under RCRA Subtitle C, however, are required to control much of their stormwater runoff through secondary containment (e.g., secondary

containment for tank systems). When a spill of a listed hazardous waste occurs, for example, the spilled material and any stormwater 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, there are a number of factors that influence to what extent industrial activities and significant materials can affect water quality.

- ◆ Geographic location
- ◆ Topography
- ◆ Extent of impervious surfaces (i.e., concrete or asphalt)
- ◆ Type of ground cover (e.g., vegetation, crushed stone, or dirt)
- ◆ Outdoor activities (e.g., only storage, or storage plus treatment and disposal)
- ◆ Size of the operation (e.g., volume of wastes handled)
- ◆ Type, duration, and intensity of precipitation events

The activities, pollutant sources, and pollutants detailed in Table 1 are commonly found at hazardous waste treatment, storage, or disposal facilities.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Hazardous Waste Treatment, Storage, or Disposal Facilities

Activity	Pollutant Source	Pollutant
Bulk Liquid/Solid Transfer	Spills during transfer of chemicals between above ground storage tank and drums or other containers.	Acids, solvents, ammonia, hydroxides, detergents, fuels
	Spills or leaks of hazardous materials used for operations	Total suspended solids (TSS), chemical oxygen demand (COD) pH, biological-oxygen demand (BOD)
	Outdoor storage or handling of chemicals	Organic and inorganic compounds.
	Unloading of chemicals and other hazardous materials	
	Leaks and spills of acids or solvents from drums or tanks	
Hazardous Material Storage	Spills or leaks	Organic and inorganic compounds
	Residual hazardous material due to poor housekeeping	
Waste Handling & Disposal	Chemical mixing	Mixed waste which can limit recyclables
Vehicle and equipment fueling and maintenance	Vehicle fueling and maintenance activities, outdoor storage tanks, and drums of gas, diesel, kerosene, lubricants, solvents	Oil and grease (O&G), diesel, gasoline, TSS, antifreeze
Building and Grounds Maintenance	Storage of pesticides and other chemicals	Pesticides, oxygen-demanding substances, sediments, nutrients, organics, and toxicants
	Application of chemicals	
Illicit discharges	Improper connection of floor, sink, or process wastewater drains to storm sewers	Dependent on source

Note: Activities may have additional pollutant sources that contain PFAS and can come into contact with stormwater discharges. Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that include PFOA, PFOS, GenX, and many other chemicals.

What BMPs can be used to minimize contact between stormwater and potential pollutants at my facility?

A variety of BMP options may be applicable to eliminate or minimize the presence of pollutants in stormwater discharges from hazardous waste treatment, storage, or disposal facilities. You will likely need to implement a combination or suite of BMPs to address stormwater runoff at your facility. Your first consideration should be for pollution prevention BMPs, which are designed to prevent or minimize pollutants from entering stormwater runoff and/or reduce the volume of stormwater

requiring management. Prevention BMPs can include regular cleanup, collection and containment of debris in storage areas, and other housekeeping practices, spill control, and employee training. It may also be necessary to implement treatment BMPs, which are engineered structures, intended to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity. Treatment BMPs are generally more expensive to install and maintain and include oil-water separators, wet ponds, and proprietary filter devices.

Facilities in this industrial sector must already be in compliance with the standards for operating a hazardous waste treatment, storage, or disposal facility as established under RCRA. Due to previously imposed requirements on hazardous waste treatment, storage, or disposal facilities, stormwater BMPs are already employed at most TSDFs. These BMPs include:

- ◆ Roofs or other forms of permanent cover for storage areas.
- ◆ Secondary containment, capable of preventing stormwater run-on from entering the system or with the capacity to contain the volume of the tank plus precipitation from a 25-year, 24-hour rainfall event, for tank systems.
- ◆ Detention/retention ponds and filtering devices.
- ◆ Daily and weekly inspections of tank systems and containers, respectively. These inspections, which should already take place, will be incorporated into facility stormwater pollution prevention plans.
- ◆ Employee training already should be occurring, will need to be expanded as necessary to include issues concerning stormwater management.

BMPs must be selected and implemented to address the following:

Good Housekeeping Practices

Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and training employees in good housekeeping techniques. Common areas where good housekeeping practices should be followed include trash containers and adjacent areas, material storage areas, vehicle and equipment maintenance areas, and loading docks. Good housekeeping practices must include a schedule for regular pickup and disposal of garbage and waste materials and routine inspections of drums, tanks, and containers for leaks and structural conditions. Practices also include containing and covering garbage, waste materials, and debris. Involving employees in routine monitoring of housekeeping practices has proven to be an effective means of ensuring the continued implementation of these measures. Industrial facilities can conduct activities that use, store, manufacture, transfer, and/or dispose of PFAS containing materials. Successful good housekeeping practices to minimize PFAS exposure to stormwater could include inventorying the location, quantity, and method of storage; using properly designed storage and transfer techniques; providing secondary containment around chemical storage areas; and using proper techniques for cleaning or replacement of production systems or equipment.

Minimizing Exposure

Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters. Examples of BMPs for exposure minimization include covering materials or activities with temporary structures (e.g., tarps) when wet weather is expected or moving materials or activities to existing or new permanent structures (e.g., buildings, silos, sheds). Even the simple practice of keeping a dumpster lid closed can be a very effective pollution prevention measure. Another example could include locating PFAS-containing materials and residues away from drainage pathways and surface waters.

Erosion and Sediment Control

BMPs must be selected and implemented to limit erosion on areas of your site that, due to topography, activities, soils, cover, materials, or other factors are likely to experience erosion. Erosion control BMPs such as seeding, mulching, and sodding prevent soil from becoming dislodged and should be considered first. Sediment control BMPs such as silt fences, sediment ponds, and stabilized entrances trap sediment after it has eroded. Sediment control BMPs should be used to back-up erosion control BMPs.

Management of Runoff

Your SWPPP must contain a narrative evaluation of the appropriateness of stormwater management practices that divert, infiltrate, reuse, or otherwise manage stormwater runoff so as to reduce the discharge of pollutants. Appropriate measures are highly site-specific, but may include, among others, vegetative swales, collection and reuse of stormwater, inlet controls, snow management, infiltration devices, and wet retention measures. Incorporating treatment like granular activated carbon may be helpful to remove certain pollutants like PFAS.

A combination of preventive and treatment BMPs will yield the most effective stormwater management for minimizing the offsite discharge of pollutants via stormwater runoff. Though not specifically outlined in this fact sheet, BMPs must also address preventive maintenance records or logbooks, regular facility inspections, spill prevention and response, and employee training.

All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements, others are quite involved. You must regularly inspect all BMPs to ensure they are operating properly, including during runoff events. As soon as a problem is found, action to resolve it should be initiated immediately.

Implement BMPs, such as those listed below in Table 2 for the control of pollutants at hazardous waste treatment, storage, or disposal facilities, to minimize and prevent the discharge of pollutants in stormwater. Identifying weaknesses in current facility practices will aid the permittee in determining appropriate BMPs that will achieve a reduction in pollutant loadings. BMPs listed in Table 2 are broadly applicable to hazardous waste treatment, storage, or disposal facilities; however, this is not a complete list and you are recommended to consult with regulatory agencies or a stormwater engineer/consultant to identify appropriate BMPs for your facility.

One activity that is not included in the RCRA requirements is loading and unloading operations and the potential for spills during this process. Table 2A identifies examples of effective BMPs for the control of pollutants associated with unloading and loading activities.

Table 2. BMPs for Potential Pollutant Sources at Hazardous Waste Treatment, Storage, or Disposal Facilities

Pollutant Source	BMPs
Hazardous Material Storage	<ul style="list-style-type: none"> <input type="checkbox"/> Confine storage of hazardous materials to designated areas. <input type="checkbox"/> Storage of hazardous materials should be indoors or in a covered area. <input type="checkbox"/> Store hazardous materials according to the manufacturer by installing concrete or non-absorbing berms around each specific hazardous material to avoid mixing wastes. <input type="checkbox"/> Ensure sufficient aisle space to ease inspections and handling. <input type="checkbox"/> Store hazardous materials away from high-traffic areas. <input type="checkbox"/> Implement inspection schedule for storage areas to detect problems before they occur. <input type="checkbox"/> Inspect all containers prior to placing in hazardous materials storage areas. <input type="checkbox"/> Store drums of hazardous material on spill pallets. <input type="checkbox"/> ASTs of hazardous materials should be stored within secondary containment equipped with self bailers, shutoff valve, and sumps. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Train employees on proper storage techniques.
Bulk liquid/solid transfer areas	<ul style="list-style-type: none"> <input type="checkbox"/> Confine transferring activities to a designated area. <input type="checkbox"/> Performing transfer activities indoors or in a covered area. <input type="checkbox"/> Install an impervious or concrete pad under area for bulk transfer activities with area sloped toward sump or detention pond. <input type="checkbox"/> During transfer activities of hazardous materials always close drains using drain seals, drain guards, drain plugs, or a shutoff valve. <input type="checkbox"/> After drum use, washout should drain directly into a clarifier. <input type="checkbox"/> Place track pans or popup pool containers under tankers before transfer activities occur to prevent uncontained spills. <input type="checkbox"/> Avoid transferring bulks materials in the rain. <input type="checkbox"/> Inspect the transfer areas to detect problems before they occur. <input type="checkbox"/> Inspect all containers prior to transferring activities of hazardous materials. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Train employees on proper bulk transfer techniques.
Bulk storage areas	<ul style="list-style-type: none"> <input type="checkbox"/> Confine bulk storage to a designated area. <input type="checkbox"/> Store hazardous bulk materials indoors or in a covered area. <input type="checkbox"/> Cover bulk materials with permanent cover (e.g., roofs) or temporary cover (e.g., tarps). <input type="checkbox"/> Implement schedule to conduct inspections of the bulk storage areas to detect problems before they occur. <input type="checkbox"/> Inspect all containers prior to storage of outside bulk materials. <input type="checkbox"/> Store outside bulk materials within secondary containment either using concrete berms or other non absorbing materials. <input type="checkbox"/> Berm, curb or dike outside bulk storage areas. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Train employees on proper outside bulk storage of hazardous material techniques.

Table 2. BMPs for Potential Pollutant Sources at Hazardous Waste Treatment, Storage, or Disposal Facilities

Pollutant Source	BMPs
Vehicle and equipment fueling	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct fueling operations (including the transfer of fuel from tank trucks) on an impervious or contained pad or under a roof or canopy where possible. Covering should extend beyond spill containment pad to prevent rain from entering. <input type="checkbox"/> When fueling in uncovered area, use concrete pad (asphalt is not chemically resistant to the fuels being handled). <input type="checkbox"/> Use drip pans where leaks or spills of fuel can occur and where making and breaking hose connections. <input type="checkbox"/> Use fueling hoses with check valves to prevent hose drainage after filling. <input type="checkbox"/> Use spill and overflow protection devices including gutter guards, basin guard, and curb guards. <input type="checkbox"/> Keep spill cleanup material readily available. Clean up spills and leaks immediately. <input type="checkbox"/> Minimize/eliminate run-on into fueling area with diversion dikes, berms, curbing, surface grading or other equivalent measures. <input type="checkbox"/> Direct stormwater from fueling area into detention pond or filtering system. <input type="checkbox"/> Use dry cleanup methods for fuel area rather than hosing down the fuel area. Implement procedures for sweeping up absorbents as soon as spilled substance have been absorbed. <input type="checkbox"/> Fuel pumps should be protected from collisions by installing curbing or posts. <input type="checkbox"/> Discourage "topping off" of fuel tanks. <input type="checkbox"/> Implement inspection schedule of preventive maintenance on fuel storage tanks to detect potential leaks before they occur. <input type="checkbox"/> Train employees as well as any outside contractor, the proper fueling techniques.
Vehicle maintenance	<ul style="list-style-type: none"> <input type="checkbox"/> Eliminate floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly. Collected wastes should be properly treated or disposed of by a licensed waste hauler. <input type="checkbox"/> Implement preventive measures to avoid spills and drips. <input type="checkbox"/> Conduct all cleaning at a centralized station so the solvents stay in one area. <input type="checkbox"/> If parts are dipped in liquid, remove them slowly to avoid spills. <input type="checkbox"/> Use drip pans, drain boards, and drying racks to direct drips back into a fluid holding tank for reuse. <input type="checkbox"/> Drain all parts of fluids prior to disposal. Oil filters can be crushed and recycled. <input type="checkbox"/> 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. <input type="checkbox"/> Clean up leaks, drips, and other spills without using large amounts of water. Use absorbents for dry cleanup whenever possible. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Prohibit the practice of hosing down an area where the practice would result in the discharge of pollutants to a stormwater system. <input type="checkbox"/> Do not pour liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. <input type="checkbox"/> Maintain inventory of materials. <input type="checkbox"/> Eliminate or reduce quantity of hazardous materials and waste by substituting non- hazardous or less hazardous materials. <input type="checkbox"/> Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). <input type="checkbox"/> Store batteries and other significant materials inside or if stored outdoors, cover with tarps and stored on spill pallets

Table 2. BMPs for Potential Pollutant Sources at Hazardous Waste Treatment, Storage, or Disposal Facilities (continued)

Pollutant Source	BMPs
Vehicle maintenance (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Dispose of oily rags, oil filters, air filters, batteries, spent coolant, and degreasers in compliance with RCRA regulations. <p>Minimizing Exposure</p> <ul style="list-style-type: none"> <input type="checkbox"/> Perform all cleaning operations indoors or under covering when possible. Conduct the cleaning operations in an area with a concrete floor with no floor drainage other than to sanitary sewers or treatment facilities. <input type="checkbox"/> If operations are uncovered, perform them on a concrete pad that is impervious and contained. <input type="checkbox"/> Park vehicles and equipment indoors or under a roof whenever possible and maintain proper control of oil leaks/spills. <input type="checkbox"/> Check vehicles closely for leaks and use pans to collect fluid when leaks occur. <p>Management of Runoff</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use berms, curbs, grassed swales or other diversion measures to ensure that stormwater runoff from other parts of the facility do not flow over the maintenance area. <input type="checkbox"/> Collect the stormwater runoff from the cleaning area and provide treatment or recycling. Discharge vehicle wash or rinse water to the sanitary sewer (if allowed by sewer authority), wastewater treatment, a land application site, or recycle on-site. DO NOT discharge washwater to a storm drain or to surface water. <p>Inspections and Training</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inspect the maintenance area regularly to ensure BMPs are implemented. <input type="checkbox"/> Train employees on waste control and disposal procedures.
Vehicle and equipment storage and parking	<ul style="list-style-type: none"> <input type="checkbox"/> Store vehicles and equipment indoors. <input type="checkbox"/> Install berms and dikes in storage areas. <input type="checkbox"/> Use absorbents and dry cleanup methods. <input type="checkbox"/> Clean pavement surface to remove oil and grease. <input type="checkbox"/> Use drip pans under all vehicles and equipment waiting for maintenance. <input type="checkbox"/> Cover the storage area with a roof. <input type="checkbox"/> Inspect the storage yard for filling drip pans and other problems regularly. <input type="checkbox"/> Train employees on procedures for storage and inspection items.

Table 2A. BMPs for Potential Pollutant Sources Associated with Unloading and Loading at Hazardous Waste Treatment, Storage, or Disposal Facilities

Pollutant Source	BMPs
Outdoor unloading and loading	<ul style="list-style-type: none"> <input type="checkbox"/> Confine loading/unloading activities to a designated area. <input type="checkbox"/> Performing loading/unloading activities indoors or in a covered area. <input type="checkbox"/> Cover loading/unloading area with permanent cover (e.g., roofs) or temporary cover (e.g., tarps). <input type="checkbox"/> Close storm drains during loading/unloading activities in surrounding areas. <input type="checkbox"/> Avoid loading/unloading materials in the rain. <input type="checkbox"/> Inspect the unloading/loading areas to detect problems before they occur. <input type="checkbox"/> Inspect all containers prior to loading/unloading of any raw or spent materials. <input type="checkbox"/> Berm, curb or dike loading/unloading areas. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Train employees on proper loading/unloading techniques.

What if activities and materials at my facility are not exposed to precipitation?

The industrial stormwater program requires permit coverage for a number of specified types of industrial activities. However, when a facility is able to prevent the exposure of ALL relevant activities and materials to precipitation, it may be eligible to claim no exposure and qualify for a waiver from permit coverage.

If you are regulated under the industrial permitting program, you must either obtain permit coverage or submit a no exposure certification form, if available. Check with your permitting authority for additional information as not every permitting authority program provides no exposure exemptions.

Where do I get more information?

For additional information on the industrial stormwater program see www.epa.gov/npdes/stormwater/msgp.

A list of names and telephone numbers for each EPA Region or state NPDES permitting authority can be found at www.epa.gov/npdes/stormwatercontacts.

References

Information contained in this Fact Sheet was compiled from EPA's past and current Multi-Sector General Permits and from the following sources:

- ◆ City of Phoenix, Street Transportation Department, Storm Water Management Section. 2004. Prevent Stormwater Contamination Best Management Practices for: Section K - Hazardous Waste Facilities (Typically RCRA subtitled) SIC Code - NA/NAICS Code - 562211. SIC Codes: 3210-3299." <http://phoenix.gov/STREETS/hzwst504.pdf>
- ◆ Naval Facilities Engineering Service Center. "Storm Water Best Management Practices (BMP) Decision Support Tool: Storm Water Pollution Prevention Options by Category. Category: Hazardous Waste Storage, Treatment, and Recycling." <http://205.153.241.230/stormwaterbmp/cgi-bin/P2Cat.cfm?Cat=Hazardous%20Waste%20Storage,%20Treatment%20and%20Recycling>
- ◆ Orange County, California; Watershed & Coastal Resources Division. www.ocwatersheds.com/StormWater/documents_bmp_existing_development.asp#ind
- ◆ U.S. EPA, September 1992. Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. EPA 832-R-92-006. www.epa.gov/npdes/stormwater
- ◆ U.S. EPA, Office of Science and Technology. 1999. Preliminary Data Summary of Urban Stormwater Best Management Practices. EPA-821-R-99-012. www.epa.gov/OST/stormwater/
- ◆ U.S. EPA, Office of Wastewater Management. NPDES Stormwater Multi-Sector General Permit for Industrial Activities (MSGP). www.epa.gov/npdes/stormwater/msgp