

INDUSTRIAL STORMWATER

FACT SHEET SERIES

Sector T: Treatment Works



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What is the NPDES stormwater permitting 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 treatment works including those facilities:

- ◆ Treating domestic sewage with a design flow of 1.0 M.G.D. or more,
- ◆ Required to have an approved pretreatment program under 40 CFR Part 403
- ◆ Having land dedicated to the disposal of sewage sludge within the confines of the facility

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 my facilities activities?

Pollutants conveyed in stormwater discharges from treatment works will vary. There are a number of factors that influence to what extent industrial activities and significant materials can affect water quality.

- ◆ Geographic location
- ◆ Topography
- ◆ Hydrogeology
- ◆ Extent of impervious surfaces (e.g., concrete or asphalt)
- ◆ Type of ground cover (e.g., vegetation, crushed stone, or dirt)
- ◆ Outdoor activities (e.g., material storage, loading/unloading, vehicle maintenance)
- ◆ Size of the operation
- ◆ Type, duration, and intensity of precipitation events

The activities, pollutant sources, and pollutants detailed in Table 1 are commonly found at treatment works.

Table 1. Common Activities, Pollutants Sources, and Associated Pollutants at Treatment Works

Activity	Pollutant Source	Pollutant
Preparation of chemical, biological and physical treatment processes	Spills and leaks of process chemicals and materials	Disinfectants, polymers and coagulants, alum, ferric chloride, soda ash, lime, sodium aluminate, sodium hypochlorite, caustic soda, chlorine, sodium bisulfite.
Soil amending and grass fertilizing	Over fertilizing	Commercial brands of balance fertilizers (6-6-6, 8-8-8 or 12-12-12), commercial sludge based products, nitrogen, other nutrients, phosphorous, ammonia. Aluminum sulfate, liquid chlorine, liquid polymer, fuel, oil.
Liquid storage in above ground storage	External corrosion and structural failure	Aluminum sulfate, liquid chlorine, bisulfite, liquid polymer, fuel, oil.
	Installation problems	
	Spills and overfills due to operator error	
	Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)	
	Leaks or spills during pumping of liquids from barges, trucks, or rail cars to a storage facility	
Pest control	Large quantities of pesticide application, pesticide storage	Diazanone, malathion, amdro, dimethylphthalate, diethyl phthalate, dichlorvos, carbaryl, skeetal, batex, liquid copper
Sludge drying beds	Sludge	Nitrate, TDS, TSS, ammonia, fecal pathogens.
Sludge storage piles	Sludge	Nitrate, TDS, TSS, ammonia, fecal pathogens.
Sludge transfer	Sludge, vehicles, transfer equipment	Nitrate, TDS, TSS, oil, fuel, hydraulic fluids, ammonia, fecal pathogens
Septage transfer	Solid and liquid sanitary waste, vehicles	Nitrate, TDS, TSS, oil, fuel, hydraulic fluids, ammonia, fecal pathogens
Incineration	Ash impoundments/piles	Heavy metals, TDS, TSS
Equipment/vehicle maintenance and storage	Spills and leaks of lubricants and coolants	solvents, acids, oil, grease, arsenic, lead, cadmium, chromium, chemical oxygen demand (COD), and benzene
Miscellaneous	Grit and scum piles from clarifiers, screens, exposed soil	TSS, heavy metals, fecal coliform, nitrate

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 treatment works. 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.

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 treatment works, 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 treatment works; 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. Additionally, treatment facilities should consider collecting all runoff and conveying it to the treatment works.

Table 2. BMPs for Potential Pollutant Sources at Treatment Works

Pollutant Source	BMPs
Preparation of chemical, biological and physical treatment process	<ul style="list-style-type: none"> <input type="checkbox"/> Store process chemicals inside buildings. <input type="checkbox"/> Use drip pans under drums and equipment where feasible. Inspect regularly the storage yard for filled drip pans and other problems. <input type="checkbox"/> Train employees on procedures for storing and inspecting chemicals.
Soil amending and grass fertilizing	<ul style="list-style-type: none"> <input type="checkbox"/> Use the appropriate amount of fertilizer. <input type="checkbox"/> Train employees in timing and quantity to avoid overfertilization.
Liquid storage in above ground storage containers	<ul style="list-style-type: none"> <input type="checkbox"/> Cover and/or enclose chemical storage areas (including temporary cover such as a tarp that prevents contact with precipitation). <input type="checkbox"/> Provide secondary containment around chemical storage areas. <input type="checkbox"/> If containment structures have drains, ensure that the drains have valves, and that valves are maintained in the closed position. Institute protocols for checking/testing stormwater in containment areas prior to discharge. <input type="checkbox"/> Use double-walled tanks with overflow protection. <input type="checkbox"/> Locate storage areas away from high traffic areas and surface waters. <input type="checkbox"/> Inspect storage tanks and piping systems (pipes, pumps, flanges, couplings, hoses, and valves) for failures or leaks and perform preventive maintenance. <input type="checkbox"/> Maintain an inventory of fluids to identify leakage. <input type="checkbox"/> Provide fluid level indicators. <input type="checkbox"/> Properly dispose of chemicals that are no longer in use. <input type="checkbox"/> Store and handle reactive, ignitable, or flammable liquids in compliance with applicable local fire codes, local zoning codes, and the National Electric Code. <input type="checkbox"/> Provide drip pads/pans where chemicals are transferred from one container to another to allow for recycling of spills and leaks. <input type="checkbox"/> Develop and implement spill plans or spill prevention, containment, and countermeasure (SPCC) plans, if required for your facility. <input type="checkbox"/> Train employees on proper storage and transfer procedures.

Table 2. BMPs for Potential Pollutant Sources at Treatment Works (continued)

Pollutant Source	BMPs
Pest control	Pesticide Application <input type="checkbox"/> Apply pesticides only if needed. <input type="checkbox"/> Train employees in techniques to minimize pesticide application.
Sludge drying beds	<input type="checkbox"/> Ensure drying bed is draining properly (e.g., check for clogging). <input type="checkbox"/> Avoid overfilling drying bed. <input type="checkbox"/> Grade the land to divert flow around drying bed. <input type="checkbox"/> Berm, dike, or curb drying bed areas. <input type="checkbox"/> Cover drying beds.
Sludge storage piles	<input type="checkbox"/> Confine storage of sludge to a designated area outside drainage pathways and as far from any receiving water body as possible. <input type="checkbox"/> Store sludge on an impervious surface (e.g., concrete pad). <input type="checkbox"/> Grade the land to divert flow around storage piles. <input type="checkbox"/> Berm, dike, or curb sludge storage piles. <input type="checkbox"/> Use control measures such as silt fence or waddles to control sediment from leaving storage area. <input type="checkbox"/> Cover sludge storage piles.
Sludge transfer	Sludge drying beds <input type="checkbox"/> Conduct transfer operations over an impervious surface to enable easy collection of spilled materials. <input type="checkbox"/> Promptly remove any sludge spilled during transfer. <input type="checkbox"/> Avoid transferring sludge during rain events. <input type="checkbox"/> Grade the land to divert flow around transfer areas. <input type="checkbox"/> Berm, curb, or dike transfer areas. Mechanical Dewatering <input type="checkbox"/> Cover loading area and perform this activity on an impervious pad to enable easy collection of spilled materials. <input type="checkbox"/> Avoid locating transfer operations near receiving water bodies.
Incineration-ash impoundments/piles	<input type="checkbox"/> Line ash impoundments with clay (or other type of impervious material). <input type="checkbox"/> Ensure ash impoundments will hold maximum volume of ash and a 10-year, 24-hour rain event. <input type="checkbox"/> Curb, berm, or dike ash storage areas. <input type="checkbox"/> Avoid locating ash storage areas near receiving waterbodies.
Equipment/vehicle maintenance and storage	Good Housekeeping <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"/> Do 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.

Table 2. BMPs for Potential Pollutant Sources at Treatment Works (continued)

Pollutant Source	BMPs
Equipment/vehicle maintenance and storage (continued)	<p>Good Housekeeping (continued)</p> <ul style="list-style-type: none"> <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"/> 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 an organized inventory of materials. <input type="checkbox"/> Eliminate or reduce the number and amount of hazardous materials and waste by substituting nonhazardous 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. <input type="checkbox"/> Dispose of greasy 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 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, or grassed swales other diversion measures to ensure that stormwater runoff from other parts of the facility does not flow over the maintenance area. <input type="checkbox"/> Collect the stormwater runoff from the cleaning area and provide treatment or recycling. <input type="checkbox"/> Discharge vehicle wash or rinse water to the treatment works, 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 in waste control and disposal procedures.
Miscellaneous	<ul style="list-style-type: none"> <input type="checkbox"/> Dispose of grit/scum at a licensed landfill. <input type="checkbox"/> Dispose of screenings on a daily basis. <input type="checkbox"/> Maximize vegetative cover to stabilize soil and reduce erosion. <input type="checkbox"/> Routing stormwater to the treatment works. <input type="checkbox"/> Cover compost piles. <input type="checkbox"/> Cover exposed materials at septage or hauled waste receiving stations.

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:

- ◆ Pierce County Washington Public Works and Utilities. "Stormwater Pollution Prevention Manual: A Guide to Best Management Practices for Industries, Businesses, and Homeowners." www.co.pierce.wa.us/pc/services/home/environ/water/wq/bmpmanual.htm
- ◆ U.S. Department of Defense, Department of the Navy. "Storm Water Best Management Practices (BMP) Decision Support Tool - Stormwater Pollution Prevention Options by Category: Industrial WWTP." <http://205.153.241.230/stormwaterbmp/cgi-bin/P2Cat.cfm?Cat=Industrial%20WWTP>
- ◆ U.S. Department of Defense, Department of the Navy. "Storm Water Best Management Practices (BMP) Decision Support Tool - Stormwater Pollution Prevention Options by Category: Sanitary WWTP." <http://205.153.241.230/stormwaterbmp/cgi-bin/P2Cat.cfm?Cat=Sanitary%20WWTP>
- ◆ 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