

INDUSTRIAL STORMWATER

FACT SHEET SERIES

Sector B: Paper and Allied Products Manufacturing Facilities



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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 paper and allied products manufacturing facilities as defined by Standard Industrial Classification (SIC) Major Group Code 26. Facilities and products in this group fall under the following categories, all of which require coverage under an industrial stormwater permit:

- ◆ Pulp mills (SIC 2611)
- ◆ Paper mills (SIC 2621)
- ◆ Paperboard mills (SIC 2631)
- ◆ Paperboard containers and boxes (SIC 2652-2657)
- ◆ Converted paper and paperboard products, except containers and boxes (SIC 2671-2679)

Products manufactured by these facilities 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.

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 measures that will be implemented at your facility to minimize the discharge of these pollutants in runoff from the site. These 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 facility's activities?

Pollutants conveyed in stormwater discharges from facilities involved with the manufacturing of paper and allied products will vary. There are a number of factors that influence to what extent industrial activities and significant materials can affect water quality.

- ◆ Geographic location
- ◆ Hydrogeology
- ◆ Topography
- ◆ Extent of impervious surfaces (e.g., concrete or asphalt)
- ◆ Type of ground cover (e.g., vegetation, crushed stone, or dirt)
- ◆ 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 paper and allied products manufacturing facilities.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Paper and Allied Products Manufacturing Facilities

Activity	Pollutant Source	Pollutant
Raw material preparation	Exposure of the generated wood chips, sawdust, and other wood debris	Total suspended solids (TSS) and biochemical oxygen demand (BOD5)
Pulping	Storage of materials used for reclamation of useful pulp	Detergents, solvents, TSS, and BOD
Bleaching	Storage of chemicals used for bleaching of pulp	Hydrosulfite, hypochlorite, chlorine, oxygen, and peroxides
Papermaking	Storage of coatings, when exposed to stormwater	Some mixture of starches, latices, polyvinylacetate, recoverable solvents, TSS, and BOD
Materials loading and unloading, storage, and waste management and disposal	Spills and leaks of materials	Solvents, glues, fuels, 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
Equipment/vehicle maintenance, repair, and storage	Spills and leaks of materials	Solvents, glues, fuels, 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
	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 and grease, arsenic, lead, cadmium, chromium, chemical oxygen demand (COD), and benzene
Vehicle fueling	Diesel fuel	Diesel, gasoline, oil

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 paper and allied product manufacturing 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.

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 paper and allied product manufacturing 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 paper and allied product manufacturing 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.

Table 2. BMPs for Potential Pollutant Sources at Paper and Allied Products Manufacturing Facilities

Pollutant Source	BMPs
Loading and unloading areas	<ul style="list-style-type: none"> <input type="checkbox"/> Confine storage to designated and labeled areas outside of drainage pathways. <input type="checkbox"/> Cover storage areas with a roof or tarp. <input type="checkbox"/> Divert stormwater around storage areas with vegetated swales, and/or berms. <input type="checkbox"/> Provide secondary containment for storage tanks and drum storage. <input type="checkbox"/> Cover dumpsters used for waste paper and other materials. <input type="checkbox"/> Store materials on concrete pads to allow for cleanup of spills or leaks. <input type="checkbox"/> Expedite recycling process for exposed scrap paper. <input type="checkbox"/> Develop and implement spill plans. <input type="checkbox"/> Provide for dust and debris collection where cyclones are utilized. <input type="checkbox"/> Train employees in spill prevention and control
Storing logs, lumber, and other timber products	<ul style="list-style-type: none"> <input type="checkbox"/> Divert stormwater around storage areas with vegetated swales, and/or berms. <input type="checkbox"/> Locate storage areas on stable, well-drained soils with slopes of 2–5 percent to prevent ponding. Slopes should be stabilized. <input type="checkbox"/> Line storage areas with crushed rock or gravel or porous pavement to promote infiltration, minimize discharge, and provide sediment and erosion control. <input type="checkbox"/> Practice good housekeeping measures such as frequent removal of debris, bark, and wood waste. Cleanup methods may include mobile sweepers, scrapers, brow logs, or scoops. <input type="checkbox"/> Use properly designed basins for collection, containment, and recycling of log spraying materials. <input type="checkbox"/> Use sedimentation measures such as silt fence to control sediment from leaving storage area. <input type="checkbox"/> Cover piles to prevent contact with stormwater (use roofs, canopies, soils, sheds, etc.).

Table 2. BMPs for Potential Pollutant Sources at Paper and Allied Products Manufacturing Facilities (continued)

Pollutant Source	BMPs
Storing logs, lumber, and other timber products	<ul style="list-style-type: none"> <input type="checkbox"/> For solid wastes use covered containers such as dumpsters or garbage cans that are durable, corrosion resistant, non-absorbent, and/or non-leaking. <input type="checkbox"/> For log storage piles, develop a leachate collection system to capture and treat discharges (do not allow leachate to discharge to the storm drain system) <input type="checkbox"/> Sweep the log storage yard on a regular basis. <input type="checkbox"/> Train employees in good housekeeping measures.
Storing chemicals	<ul style="list-style-type: none"> <input type="checkbox"/> Provide secondary containment for chemical storage areas. 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"/> Properly dispose of chemicals that are no longer in use by taking them to a Hazardous Waste Recycling Center or contracting with a qualified disposal company. <input type="checkbox"/> Clearly identify accumulation dates on the outside of waste chemical storage units. <input type="checkbox"/> Maintain an inventory of fluid levels to identify leakage. <input type="checkbox"/> Locate storage areas away from high traffic areas and surface waters. <input type="checkbox"/> Develop and implement spill prevention, containment, and countermeasure (SPCC) plans, if required for your facility. <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"/> 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 transfer of PFAS containing materials and their proper collection and disposal methods in the event of a release from their container. <input type="checkbox"/> Train employees in spill prevention and control.
Storing liquid fuels	<ul style="list-style-type: none"> <input type="checkbox"/> If area is uncovered, connect sump outlet to sanitary sewer (if possible) or to an oil/water separator, catch basin filter, etc. If connecting to a sanitary sewer check with the system operator to ensure that the discharge is acceptable. <p data-bbox="412 1224 634 1251">Above ground tanks</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use secondary containment, such as dikes, with a height sufficient to contain a spill (the greater of 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank). 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"/> Keep liquid transfer nozzles/hoses in secondary containment area. <p data-bbox="412 1476 691 1503">Portable containers/drums</p> <ul style="list-style-type: none"> <input type="checkbox"/> Store drums indoors when possible. <input type="checkbox"/> Store drums, including empty or used drums, in secondary containment with a roof or cover (including temporary cover such as a tarp that prevents contact with stormwater). <input type="checkbox"/> Clearly label drum with its contents.
Vehicle 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 and 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 an uncovered area, conduct fueling operations on a 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 when making and breaking hose connections.

Table 2. BMPs for Potential Pollutant Sources at Paper and Allied Products Manufacturing Facilities (continued)

Pollutant Source	BMPs
Vehicle fueling (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Use fueling hoses with check valves to prevent hose drainage after filling. <input type="checkbox"/> Keep spill cleanup materials readily available. <input type="checkbox"/> Clean up spills and leaks immediately. <input type="checkbox"/> Use spill and overflow protection devices. <input type="checkbox"/> Use curbs or berms to minimize stormwater run-on to fueling areas. <input type="checkbox"/> Use dry cleanup methods for fuel area rather than hosing down the fuel area. Sweep up absorbents as soon as spilled substances have been absorbed. <input type="checkbox"/> Perform inspections and preventive maintenance on fuel storage tanks to detect potential leaks before they occur. <input type="checkbox"/> Inspect the fueling area for leaks or spills. <input type="checkbox"/> Train personnel on vehicle fueling BMPs. <input type="checkbox"/> Provide curbing or posts around fuel pumps to prevent collisions from vehicles. <input type="checkbox"/> Discourage "topping off" of fuel tanks.
Equipment/vehicle maintenance	<p>Good Housekeeping</p> <ul style="list-style-type: none"> <input type="checkbox"/> Eliminate floor drains 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"/> Prevent and contain spills and drips. <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"/> Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers by taking them to a disposal site (check your Phone Book under Hazardous Materials and Waste Services). <input type="checkbox"/> Store batteries and other significant material inside. <input type="checkbox"/> Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). <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"/> Clean up leaks, drips, and other spills without using large amounts of water or liquid cleaners. 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"/> 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"/> Do not pour liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. <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.

Table 2. BMPs for Potential Pollutant Sources at Paper and Allied Products Manufacturing Facilities (continued)

Pollutant Source	BMPs
Equipment/vehicle maintenance (continued)	<input type="checkbox"/> If operations are uncovered, perform them on 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. Check vehicles closely for leaks and use pans to collect fluid when leaks occur. Management of Runoff <input type="checkbox"/> Use berms, curbs, or 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. 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. Inspections and Training <input type="checkbox"/> Inspect the maintenance area regularly to ensure above BMPs are implemented. <input type="checkbox"/> Train employees on waste control and disposal procedures.

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, Arizona, Street Transportation Department, Stormwater Management Section. 2004. Prevent Stormwater Contamination Best Management Practices Section B - Paper and Allied Products Manufacturing. SIC Codes 2610-2679.
<http://phoenix.gov/STREETS/papprod.pdf>
- ◆ 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