

INDUSTRIAL STORMWATER

FACT SHEET SERIES

Sector V: Textile Mills, Apparel, and Other Fabric Product Manufacturing Facilities



U.S. EPA Office of Water
EPA-833-F-06-037
December 2006

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 textile facilities as described by Standard Industrial Classification (SIC) Major Groups 22, 23, and 31 which includes all facilities that produce textiles. Facilities and products in this group fall under the following categories, all of which require coverage under an industrial stormwater permit:

- ◆ Textile mill product facilities (SIC 2211-2299), which typically receive and prepare fibers, transform these materials into fabric or related products, and finish the materials before packaging.
- ◆ Apparel facilities (SIC 2311-2399), which typically receive woven or knitted fabric for cutting, sewing, and packaging.
- ◆ Leather and leather products (SIC 3131-3199), except leather tanning and finishing (SIC 3111).

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 textile facilities 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 textile facilities.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Textile Facilities

Activity	Pollutant Source	Pollutant
Outdoor material loading/unloading	Wooden pallets, spills/leaks from material handling equipment, raw materials, finished products, solvents, dyes	Total suspended solids (TSS), pH, oil and grease, chemical oxygen demand (COD), biochemical oxygen demand (BOD5), heavy metals
Raw material storage and handling	Wool, cotton, synthetics, rayon, other fibers, coal/wood piles, fuels, oil, and/or lubricants	BOD5, COD, TSS, , pH, oil and grease, lead, chromium, and/or benzene
Storage and handling of materials for dyeing	Dyes, dye preservatives, and/or pigments	Copper, phenols, lead, chromium, zinc, aluminum, and/or acids
Storage and handling of materials for scouring and cleaning	Wool, scouring agents, and/or detergents	BOD5, COD, TSS, oil and grease, sulfides, phenols, pH, and/or chromium
Storage and handling of materials for bleaching, printing, finishing, and other activities	Dyes, bleaches, detergents, finishing agents, and/or printing products	BOD5, COD, TSS, oil and grease, sulfides, phenols, pH, chromium, chromium peroxide, and/or acids
Vehicle and equipment fueling	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

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 textile 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.

Specific good housekeeping practices for textile mills, apparel, and other fabric product manufacturing facilities include:

- ◆ Plainly labeling and storing all containerized materials (e.g., fuels, petroleum products, solvents, dyes, etc.) in a protected area, away from drains
- ◆ Using containment areas or enclosures for materials stored outdoors
- ◆ Use an inventory control plan to prevent excessive purchasing of potentially hazardous substances
- ◆ For storing empty chemical drums/containers, ensuring the drums/containers are clean (e.g., triple-rinsing) and there is no contact of residuals with precipitation/runoff. Collecting and disposing of washwater from these cleanings properly.
- ◆ Regularly cleaning above ground storage tank areas
- ◆ Using dry cleanup methods in above ground storage tank areas and fueling areas
- ◆ Addressing the replacement or repair of leaking connections, valves, transfer lines, and pipes that may carry chemicals, dyes, or wastewater where applicable

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.

Specific exposure minimization practices for textile mills, apparel, and other fabric product manufacturing facilities include covering fueling areas and covering or enclosing areas where transfer of materials may occur. Since, many processes are typically conducted indoors at textile mills, apparel, and other fabric product manufacturing facilities, then changes in the manufacturing process, such as a switch to less toxic chemicals, can lessen the amount of contamination in stormwater discharges.

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.

Specific runoff management practices for textile mills, apparel, and other fabric product manufacturing facilities include:

- ◆ Minimizing runoff of stormwater from areas adjacent to above ground storage tank and fueling areas
- ◆ Inserting filters in catch basins adjacent to above ground storage tank areas
- ◆ Treating and/or recycling stormwater runoff collected from fueling areas

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 textile 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 textile 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 Textile Facilities

Pollutant Source	BMPs
Outdoor material loading and unloading	<ul style="list-style-type: none"> <input type="checkbox"/> Confine loading/unloading activities to a designated area outside drainage pathways and away from surface waters. <input type="checkbox"/> Load/unload 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"/> Slope the impervious concrete floor or pad to collect spills and leaks and convey them to proper containment and treatment.

Table 2. BMPs for Potential Pollutant Sources at Textile Facilities (continued)

Pollutant Source	BMPs
Outdoor material loading and unloading (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Provide overhangs or door skirts to enclose trailer ends at truck loading/unloading docks. <input type="checkbox"/> For rail transfer, a drip pan shall be installed within the rails to collect spillage from the tank. <input type="checkbox"/> Where liquid or powdered materials are transferred in bulk to/from truck or rail cars, ensure hose connection points at storage containers are inside containment areas, or drip pans are used in areas where spillage may occur which are not in a containment area. <input type="checkbox"/> Install an oil/water separator in catch basins. <input type="checkbox"/> Inspect all containers prior to loading/unloading of any raw or spent materials. <input type="checkbox"/> Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run-on. <input type="checkbox"/> Dead-end sump where spilled materials could be directed. <input type="checkbox"/> Use dry cleanup methods instead of washing the areas down. <input type="checkbox"/> Train employees on proper loading/unloading techniques and spill prevention and response.
Chemical storage	<ul style="list-style-type: none"> <input type="checkbox"/> Store materials indoors when possible. <input type="checkbox"/> 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. <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"/> Plainly label and store all containerized materials (e.g., fuels, petroleum products, solvents, dyes, etc.) in a protected area, away from drains. <input type="checkbox"/> Implement an inventory control plan to prevent excessive purchasing of potentially hazardous substances. <input type="checkbox"/> Ensure that empty drums/containers that are being stored are clean and there is no contact of residuals with precipitation/runoff. Collect and dispose of washwater from these cleanings properly. <input type="checkbox"/> Store reactive, ignitable, or flammable liquids in compliance with the local fire code, and the National Electric Code. <input type="checkbox"/> Regularly clean chemical storage areas. <input type="checkbox"/> Restrict access to the chemical storage areas. <input type="checkbox"/> Insert filters in adjacent catch basins. <input type="checkbox"/> Permanently seal drains within critical areas that may discharge to a storm drain. <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 in spill prevention and control and proper materials management.
Coal pile management	<ul style="list-style-type: none"> <input type="checkbox"/> Confine storage to areas outside of drainage pathways and away from surface waters. <input type="checkbox"/> Divert stormwater around storage areas with vegetated swales, and/or berms. <input type="checkbox"/> Practice good housekeeping measures such as frequent removal of dust and debris. Cleanup methods may include mobile sweepers, scrapers, or scoops. <input type="checkbox"/> Use properly designed basins for collection, containment, and recycling of pile spraying materials. <input type="checkbox"/> Use control measures such as berms, silt fences or waddles to control sediment from leaving storage area. <input type="checkbox"/> Train employees in good housekeeping measures.

Table 2. BMPs for Potential Pollutant Sources at Textile Facilities (continued)

Pollutant Source	BMPs
Material handling: bulk liquid fuel storage	<ul style="list-style-type: none"> <input type="checkbox"/> Cover/enclose areas where the transfer of material may occur. <input type="checkbox"/> Store permanent tanks in a paved area surrounded by a dike system that provides containment for the larger of either 10 percent of the volume of all containers or 100 percent of the volume of the largest tank. <input type="checkbox"/> Tanks should be placed in gravel or concrete paved areas, away from natural drainage paths to waterways (such as parking lot drains). <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"/> Keep liquid transfer nozzles/hoses in secondary containment area. <input type="checkbox"/> Inspect storage tanks to detect potential leaks and perform preventive maintenance. <input type="checkbox"/> Inspect piping systems (pipes, pumps, flanges, couplings, hoses, valves) for failures or leaks. Develop and implement spill plans. <input type="checkbox"/> Train employees on proper filling and transfer procedures, spill prevention and control.
Material handling: containerized material storage	<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 precipitation). <input type="checkbox"/> Provide secondary containment, such as dikes or portable containers, 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). <input type="checkbox"/> If storing empty chemical drums, triple-rinse containers and collect discharge waters from washings. <input type="checkbox"/> Clearly label drum with its contents. <input type="checkbox"/> Educate personnel for proper storage, use, cleanup, and disposal of materials.
Material handling: designated material mixing areas	<ul style="list-style-type: none"> <input type="checkbox"/> Cover and enclose areas where the transfer of materials may occur. <input type="checkbox"/> Mix solvents in designated areas away from drains, ditches, and surface waters. <input type="checkbox"/> Never wash drums in the mix kitchen or dispose of obsolete dyes and chemicals down the drain. <input type="checkbox"/> When a new drum is opened, the old drum should be emptied or drained thoroughly into the new drum.
Waste management	<ul style="list-style-type: none"> <input type="checkbox"/> Store waste in enclosed and/or covered areas. <input type="checkbox"/> Store wastes in covered, leak proof containers (e.g., dumpsters, drums). <input type="checkbox"/> Cover the dumpsters or move them indoors. <input type="checkbox"/> Use linked dumpsters that do not leak. <input type="checkbox"/> Provide a lining for the dumpsters. <input type="checkbox"/> Direct runoff to on-site retention pond. <input type="checkbox"/> Ensure hazardous and solid waste disposal practices are performed in accordance with applicable federal, state, and local requirements. <input type="checkbox"/> Ship all wastes to offsite licensed landfills or treatment facilities.

Table 2. BMPs for Potential Pollutant Sources at Textile Facilities (continued)

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 (not asphalt). <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"/> Minimize/eliminate run-on onto fueling areas with diversion dikes, berms, curbing, surface grading or other equivalent measures. <input type="checkbox"/> Collect stormwater runoff and provide treatment or recycling. <input type="checkbox"/> Use dry cleanup methods for fuel area rather than hosing the fuel area down. Clean up spills and leaks immediately. <input type="checkbox"/> Discourage topping off of fuel tanks. <input type="checkbox"/> Regularly inspect and perform preventive maintenance on storage tanks to detect potential leaks before they occur. <input type="checkbox"/> Inspect the fueling area for leaks and spills. <input type="checkbox"/> Train personnel on fueling BMPs. <input type="checkbox"/> Provide curbing or posts around fuel pumps to prevent collisions during vehicle ingress and egress.

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, Storm Water Management Section. 2004. Prevent Stormwater Contamination Best Management Practices for: Section V - Textile Mills, Apparel, Leather and Other Fabric Facilities. SIC Codes: 2200-2399 & 3131-3199.
<http://phoenix.gov/STREETS/textfab.pdf>
- ◆ New Jersey Technical Assistance Program for Industrial Pollution Prevention. "Pollution Prevention Guidebooks. Textile Industry: SIC Code 22."
www.ycees.njit.edu/njtap/isr22.htm
- ◆ U.S. EPA, Office of Research and Development. 1996. Best Management Practices for Pollution Prevention in the Textile Industry. EPA/625/R-96/004.
www.p2pays.org/ref/02/01099.htm
- ◆ 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