Industrial Stormwater

Fact Sheet Series

Sector Z: Leather Tanning and Finishing 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 leather tanning and finishing facilities as defined by Standard Industrial Classification (SIC) Major Group 31. This includes both leather tanning facilities and facilities which make fertilizer solely from leather scraps and leather dust. Stormwater discharges from access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste materials, or by-products created by the facility are also required to be covered under an industrial stormwater permit.

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 leather tanning and finishing 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 leather tanning and finishing facilities.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Leather Tanning and Finishing Facilities

Activity	Pollutant Source	Pollutant
Outdoor storage of fresh and brine cured hides	Fresh and brine cured hides	Salt, organic materials (manure), biochemical oxygen demand, total suspended solids (TSS).
Beamhouse processes (trimming, soak and wash, fleshing, unhairing)	Chemical storage (drums or bags)	Depilatory chemicals.
	Empty containers of lime, depilatory chemicals	Calcium hydroxide, sodium sulfhydrate, or sodium sulfide.
	Trim scraps, hair	BOD, COD, TSS, high pH, TKN
Tanyards (bating, pickling, tanning, wringing, splitting, shaving)	Empty chemical containers	Trivalent chromium, vegetable tannins, enzymes, pickling acids (sulfuric acid), alum, syntans, chemical deliming agents, glutaraldehyde, heavy oils.
	"Blue" hides, splits, trimmings, shavings	Trivalent chromium, leather fiber and dust, suspended solids, BOD, TSS, dissolved solids.
Retan and wet finishing (retanning, bleaching and coloring, fatliquoring, buffing)	Empty chemical containers	Chromium tanning agents, vegetable extract, dyes, pigments, animal or vegetable based oils, synthetic oils made from modified mineral based oils, sulfonated oils, spent dyes
	Leather dust containing chromium	Leather fiber, trivalent chromium, TSS, tannins
Dry finishing (application of pigment to leather surface with water-based or solvent based finishes)	Emissions from spray booths and spent solvents	Pigments, solvents-acetone, pylene, glycol ether
Receiving and unloading areas	Hides	Trivalent chromium, salt.
	Chemical supplies	Depilatory chemicals, trivalent chromium, vegetable tannins, enzymes, pickling acids (sulfuric acid), alum, syntans, chemical deliming agents, glutaraldehyde, heavy oils, dyes, pigments, animal or vegetable based oils, synthetic oils, solvents and biocides.
	Leaking trucks	Oil and grease and waste materials.
	Accidental spills	Chemicals listed for supplies above.
Improper connections to storm sewer	Floor drains, process wastewater, cleaning and washdown of process equipment and process areas	Dependent on operations.
Outdoor bulk chemical storage	Above ground tanks	Sulfuric acid, ferric chloride, finishing solvents (mineral spirits), hydrated lime, surfactant.
Outdoor storage of coal	Coal piles	Oil & grease, TSS, copper, nickel, zinc.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Leather Tanning and Finishing Facilities (continued)

Activity	Pollutant Source	Pollutant
Waste management	Hoppers	Leather dust, scraps.
	Dumpsters	Empty bags & chemical containers.
	Sludge (wastewater treatment sludge stored in containers to diminish stormwater contact, awaiting offsite disposal)	Lime, pieces of leather, hair, protein-like substances, floor sweepings, trivalent chromium, biochemical oxygen demand.
Vehicle and equipment maintenance	Parts cleaning	Solvents, oil, heavy metals, acid/alkaline wastes
	Waste disposal of oily rags, oil filters, air filters, batteries	Oil, heavy metals, solvents, acids
	Fluid replacement including hydraulic fluid, brake fluid, oil, transmission fluid, coolants, and lubricants	Oil and grease, arsenic, lead, cadmium, chromium, chemical oxygen demand (COD), and benzene

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 leather tanning and finishing 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 leather tanning and finishing facilities include:

- Labeling storage containers of all materials (e.g., specific chemicals, hazardous materials, spent solvents, waste materials).
- Preventive inspection/maintenance programs or other appropriate preventive measures in buffing and shaving areas.
- Cleaning all contaminated equipment thoroughly before storing outdoors
- Inspection/maintenance programs for leaking containers or spills

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 leather tanning and finishing facilities include:

- Storing pallets/bales of raw, semi-processed or finished tannery byproducts (e.g., splits, trimmings, shavings, etc.) indoors or protecting by polyethylene wrapping, tarpaulins, roofed storage, etc.
- Covering chemical supplies, equipment, and waste piles stored outdoors
- Placing stored materials on an impermeable surface, and enclosing or putting berms (or equivalent measures) around the area to prevent stormwater run-on/runoff.
- Using dust collection enclosures in buffing and shaving areas
- Covering dumpsters
- Moving waste management activities indoors

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 by leather tanning and finishing facilities include diverting drainage from receiving, unloading, and material and waste storage areas to the process sewer or grading and berming/curbing area to prevent runoff of stormwater.

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 leather tanning and finishing 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 leather tanning and finishing 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 Leather Tanning and Finishing Facilities

Pollutant Source	BMPs
Temporary outdoor storage of fresh or brine cured hides	❑ Store hides indoors if possible. ❑ Cover the hides with a roof or temporary covering (e.g., polyethylene, tarpaulin etc.). ❑ Locate storage areas away from high traffic areas and surface waters. ❑ Minimize stormwater run-on by enclosing the area or use berms, curbs, grassed swales or other diversion measures to ensure that stormwater runoff from other parts of the facility does not flow over the area. ❑ Inspect area regularly for proper implementation of good housekeeping and control measures. ❑ Train employees on waste control and disposal procedures.
Beamhouse and tanyard operations	❑ Store chemical drums & bags and empty lime & depilatory chemical containers indoors if possible. ❑ Cover chemical drums & bags, empty lime & depilatory chemical containers and leather scraps with roof or temporary covering (e.g., tarpaulins, polyethylene) and store on elevated impermeable surface. ❑ Install curbing, containment dikes around chemical storage, empty lime & depilatory chemical containers and leather scrap storage area. ❑ Avoid use of hides treated with insecticides and fungicides. Use salts or chilling methods instead. ❑ Avoid toxic and less biodegradable antiseptics and biocides. Especially avoid those containing arsenic, mercury, lindane, and pentachlorophenol or other chlorinated substances. ❑ Minimize the use of chrome. Use trivalent chrome rather than hexavalent. Recover and recycle chrome to the extent possible. ❑ Reduce quantities of salt used for preservation. ❑ Maintain an inventory of fluids to identify leakage and properly dispose of chemicals that are no longer in use. ❑ Clean up leaks and spills immediately. ❑ Use drip pans for leaking equipment. ❑ All paved areas should be swept regularly, eliminate unnecessary flushing with water and label chemical drums and containers. ❑ Inspect area regularly for leaking drums, broken bags, proper implementation of good housekeeping and control measures, (broken cracked dikes), material inventory, material storage and operation & maintenance. ❑ Train employees on good housekeeping, proper handling of chemicals.
Retan and wet finish	❑ Reduce dust through enclosure and covering. ❑ Use nonorganic solvents for dyeing and refinishing. ❑ Implement and maintain dust collectors (vacuum, bag & cyclone) and filter systems. ❑ Regularly sweep paved areas, eliminate unnecessary flushing with water and label chemical drums and containers. ❑ Train employees on good housekeeping and proper handling of chemicals.

Table 2. BMPs for Potential Pollutant Sources at Leather Tanning and Finishing Facilities (continued)

Pollutant Source	BMPs
Dry finish	❑ Use effective spray equipment that delivers more dye to the target and less overspray. ❑ Have absorbent and other cleanup items readily available for immediate cleanup of spills. ❑ Store dyes and solvents away from traffic areas to avoid spills. ❑ Recycle paint, paint thinner, and solvents. ❑ Establish and implement effective inventory control to reduce waste, including tracking date received and expiration dates. ❑ Store dyes, paint, solvents, and rags in covered containers to prevent evaporation to the atmosphere. ❑ Use solvents with low volatility and coatings with low VOC content; use high transfer efficiency coating techniques. ❑ Inspect spray booths area regularly to ensure BMPs are implemented. ❑ Train employees on proper spraying techniques and disposal of spent solvents.
Buffing and shaving areas	❑ Install dust collection enclosures, preventative inspection/maintenance programs.
Receiving and shipping	❑ Confine loading/unloading activities to designated areas outside drainage pathways and away from surface waters. ❑ Inspect containers for leaks or damage prior to loading/unloading. ❑ Avoid loading/unloading materials in the rain or provide cover or other protection for loading docks. ❑ Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run-on. ❑ Cover loading and unloading areas and perform these activities on an impervious pad to enable easy collection of spilled materials. ❑ Slope the impervious concrete floor or pad to collect spills and leaks and convey them to proper containment and treatment. ❑ Provide overhangs or door skirts to enclose trailer ends at truck loading/unloading docks. ❑ For rail transfer, a drip pan shall be installed within the rails to collect spillage from the tank. ❑ 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. ❑ Enclose material handling systems. ❑ Cover materials entering and leaving areas. ❑ Regularly sweep area to minimize debris on the ground. ❑ Provide dust control if necessary. When controlling dust, sweep and/or apply water or materials that will not impact surface or ground water. ❑ Develop and implement spill prevention, containment, and countermeasure (SPCC) plans. ❑ Train employees in spill prevention, control, cleanup, and proper materials management techniques.
Storage areas for raw, semiprocessed, or finished tannery by-products	❑ Pallets and/or bales of raw, semiprocessed, or finished byproducts should be stored indoors or protected by polyethylene wrapping, tarpaulins, roofed storage area, or other suitable means. ❑ Confine activities to designated areas outside drainage pathways and away from surface waters. ❑ Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run-on and runoff. ❑ Place materials on an impermeable surface. ❑ Minimize storage of flesh trimmings and organic materials.

Table 2. BMPs for Potential Pollutant Sources at Leather Tanning and Finishing Facilities (continued)

Pollutant Source	BMPs
Material storage areas	❑ Store materials indoors. ❑ Install berms or dikes around storage area. ❑ Label storage units of all materials. ❑ Maintain containers and units in good condition.
Outdoor storage of contaminated equipment	❑ Protect equipment by suitable cover. ❑ Divert drainage to the process sewer. ❑ Clean equipment thoroughly prior to storage.
Liquid storage in above ground tanks	❑ If area is uncovered, connect sump outlet to sanitary sewer (if possible) or 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. If implementing separator or filter technologies ensure that regular inspections and maintenance procedures are in place. ❑ Provide 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. ❑ Use double-walled tanks with overflow protection. ❑ Keep liquid transfer nozzles/hoses in secondary containment area. ❑ Clearly tag valves to avoid human error. ❑ Install overflow protection devices on tank systems to warn operator or to automatically shut down transfer pumps when tanks reach full capacity. ❑ Inspection of tank foundations, connections, coatings, valves and piping systems. ❑ Comply with existing spill prevention, cleanup and countermeasure plans (SPCC plan) and State and Federal laws. ❑ Perform integrity testing regularly by qualified professionals. ❑ Train employees in spill prevention and control.
Improper connections to storm sewers	❑ Plug all floor drains connected to sanitary or storm sewers. ❑ Perform smoke or dye testing to determine if interconnections exist between sanitary water system and storm sewer system. ❑ Update facility schematics to accurately reflect all plumbing connections. ❑ Install a safeguard against washwaters from processing areas entering the storm sewer unless permitted. ❑ Train employees on proper disposal practices for all materials.
Coal piles	❑ Confine storage to areas outside of drainage pathways and away from surface waters. ❑ Divert stormwater around storage areas with vegetated swales, and/or berms. ❑ Practice good housekeeping measures such as frequent removal of dust and debris. Cleanup methods may include mobile sweepers, scrapers, or scoops. ❑ Use properly designed basins for collection, containment, and recycling of pile spraying materials. ❑ Use control measures such as berms, silt fences or waddles to control sediment from leaving storage area. ❑ Train employees in good housekeeping measures.

Table 2. BMPs for Potential Pollutant Sources at Leather Tanning and Finishing Facilities (continued)

Pollutant Source	BMPs
Waste management	❑ Conduct waste reduction assessment - develop guidelines for the elimination of waste generation emissions. ❑ Minimize solids waste by recovery and reuse of hide trimmings and other wastes for manufacturing glue, gelatin, tallow, etc. ❑ Institute industrial waste source reduction and recycling. ❑ Move waste management activities indoors (after safety concerns are addressed) and cover waste piles, dumpsters, hoppers, place on impermeable elevated surfaces. ❑ Provide diversion berms, dikes or grassed swales around the perimeter of the area to limit run-on. ❑ Cover trucks and inspect for leaking wastes. ❑ Inspect waste management areas for leaking containers, spills, damaged containers, uncovered waste piles, dumpsters, hoppers. ❑ Develop and maintain proper erosion control or site stabilization measures. ❑ Train employees on waste management and disposal practices for all materials.
Vehicle and equipment maintenance	Good Housekeeping ❑ 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 disposal company. ❑ Do all cleaning at a centralized station so the solvents stay in one area. ❑ If parts are dipped in liquid, remove them slowly to avoid spills. ❑ Use drip pans, drain boards, and drying racks to direct drips back into a fluid holding tank for reuse. ❑ Drain all parts of fluids prior to disposal. Oil filters can be crushed and recycled. ❑ 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. ❑ Clean up leaks, drips, and other spills without using large amounts of water. Use absorbents for dry cleanup whenever possible. ❑ Prohibit the practice of hosing down an area where the practice would result in the discharge of pollutants to a stormwater system. ❑ Do not pour liquid waste into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. ❑ Maintain an organized inventory of materials. ❑ Eliminate or reduce the number and amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials. ❑ Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). ❑ Store batteries and other significant materials inside. ❑ Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers in compliance with RCRA regulations. Minimizing Exposure ❑ 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. ❑ If operations are uncovered, perform them on concrete pad that is impervious and contained. ❑ 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.

Table 2. BMPs for Potential Pollutant Sources at Leather Tanning and Finishing Facilities (continued)

Pollutant Source	BMPs
Vehicle and equipment maintenance (continued)	Management of Runoff ❑ Use berms, curbs, grassed swales or similar means to ensure that stormwater runoff from other parts of the facility does not flow over the maintenance area. ❑ 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 recycled onsite. DO NOT discharge washwater to a storm drain or to surface water. Inspections and Training ❑ Inspect the maintenance area regularly to ensure BMPs are implemented. ❑ 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:

- U.S. EPA, Office of Science and Technology. 1999. Preliminary Data Summary of Urban Stormwater Best Management Practices. EPA-821-R-99-012.
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- U.S. EPA, Office of Wastewater Management. *NPDES Stormwater Multi-Sector General Permit for Industrial Activities (MSGP)*.
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