washed from the hides or skins. "Pickling" the hide with sulfuric acid provides the acid environment necessary for chromium tanning. In the tanning process, tanning agents such as trivalent chromium and vegetable tannins convert the hide into a stable product which resists decomposition. Wringing of the ''blue hides'' (hides tanned with trivalent chromium) removes excess moisture with a machine similar to a clothes wringer. Splitting adjusts the thickness of the tanned hide to the requirements of the finished product and produces a "split" from the flesh side of the hide. The hide is then shaved to remove any remaining fleshy matter. Wastewater from tanyard operations contain inorganic chemical salts, small amounts of proteinaceous

hair and waste, and large amounts of ammonia from the bating process. Pickling generates a highly acidic waste (pH of 2.5-3.5) which contains salt. Spent chromium liquors contain high concentrations of trivalent chromium in acid solution with low concentrations of BOD and TSS. Vegetable tanning vat discharges are highly colored, and contain significant amounts of BOD, COD, and dissolved solids.

Retanning and Wet Finishing Processes—These include retaining, bleaching, coloring, fatliquoring, and finishing. The most common retanning agents are chromium, vegetable extracts and syntans (based upon naphthalene and phenol). Sodium bicarbonate and sulfuric acid are sometimes used to bleach leather. Coloring involves the use

of dyes (usually aniline based) on the tanned skin. Animal or vegetable fatliquors are added to replace the natural oils lost in the beamhouse and tanyard processes. Finishing includes all operations performed on the hide after fatliquoring, and includes finishing to enhance color and resistance to stains and abrasions, smoothing and stretching of the skin, drying, conditioning, staking, dry milling, buffing and plating. These processes generate wastes with additional quantities of trivalent chromium, tannins, sulfonated oils, and spent dyes, which are low in BOD and TSS, and high in COD.

Table Z-1 lists potential storm water pollutant source activities that may take place at leather tanning facilities.

TABLE Z-1.—POLLUTANTS POTENTIALLY FOUND IN STORM WATER DISCHARGES AT LEATHER TANNING FACILITIES

Activity	Pollutant source	Pollutant
Outdoor storage of fresh and brine cured hides	Fresh & brine cured hides	Salt, organic materials (manure), biochemical oxygen demand.
Beamhouse Processes (trimming, soak & wash, fleshing, unhairing).	Chemical storage (drums or bags)	Depilatory chemicals.
	Empty containers of lime, depilatory chemi- cals.	Calcium hydroxide, sodium sulfhydrate, or so- dium sulfide.
Tanyards (bating, pickling, tanning, wringing, splitting, shaving).	Empty chemical containers	Trivalent chromium, vegetable tannins, en- zymes, 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.
Retan and Wet Finishing (retanning, bleaching & coloring, fatliquoring, buffing).	Empty chemical containers	Chromium tanning agents, vegetable extract, dyes, pigments, animal or vegetable based oils, synthetic oils made from modified min- eral based oils.
	Leather dust containing chromium	Leather fiber, trivalent chromium, suspended solids.
Dry finishing (Application of pigment to leather surface with water-based or solvent based finishes).	Emissions from spray booths and spent sol- vents.	Pigments, solvents-acetone, pylene, glycol ether.
Receiving and unloading areas	Hides Chemical supplies	Trivalent chromium, salt. Depilatory chemicals, trivalent chromium, veg- etable tannins, enzymes, pickling acids (sul- furic acid), alum, syntans, chemical deliming agents, glutaraldehyde, heavy oils, dyes, pigments, animal or vegetable based oils, synthetic oils, solvents and biocides.
	Leaking trucks	Oil & grease and waste materials.
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 Waste Management	Coal piles Hoppers Dumpsters Sludge (wastewater treatment sludge stored in containers to diminish storm water con- tact, awaiting offsite disposal).	Oil & grease, TSS, copper, nickel, zinc. Leather dust, scraps. Empty bags & chemical containers. Lime, pieces of leather, hair, protein-like sub- stances, floor sweepings, trivalent chro- mium, biochemical oxygen demand.

Sources: NPDES Storm Water Group Applications—Part 1. Received by EPA May 22, 1991—February 18, 1992. EPA, Office of Water. November 1982. "Development Document for Effluent Limitations Guidelines and Standards for the Leather Tanning and Finishing Point Source Category." EPA/440/1–82/016. EPA, Office of Water Regulations and Standards and Office of Water Enforcement and Permits. September 1986. "Guidance Manual for Leather Tansing and Finishing Point Source Category." EPA/440/1–82/016.

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