

Understanding Wastewater Regulations

Wastewater contaminants from printing operations

Print shops may generate industrial wastewater from many sources: film and plate processing; cylinder preparation, spent fountain solution; equipment washing; and water based inks, coatings, adhesives and cleaning solutions. The discharge of industrial wastewater can represent a significant environmental issue for some printing operations.

There are basically three categories of wastewater discharges:

- sanitary wastewaters from the public to a local publicly owned treatment works (POTW) facility (wastewater treatment plant)
- industrial wastewater discharges from industry processes
- storm water runoff from municipalities, construction disturbances of land, and industrial facilities

Regulations for wastewater discharges

The U.S. EPA, Kansas Department of Health and Environment (KDHE), and your publicly owned treatment works (POTW) have regulations for the discharge of these wastewaters to groundwater (i.e. septic systems), surface waters (streams, ponds, rivers, etc.), and into municipal sewer systems (POTWs).

National regulations created

- bans on Flammables, Oil/Greases, and Toxic Vapors to wastewater discharges
- hazardous waste discharge notification.
- categorical standards for certain industries known to create problematic wastewaters that can adversely impact POTWs operations or storm water
- significant dischargers (defined by gallons of wastewater discharged) must test/report biannually.
- NPDES permits for storm water discharges

In August 1990 USEPA established a discharge ban that imposed restrictions on the following types of discharges:

- flammables—flashpoints less than 140°F.
- explosives.
- chemicals with potential to create toxic gases, fumes, or vapors.
- oil and grease.
- toxic materials that can cause “pass through of contaminants or interfere in the plants treatment process.
- high levels of heavy metals or organic compounds.
- corrosives
- hot temperatures that could disrupt treatment.
- reactives that could produce poisonous gas.

This section outlines the requirements for each receiving system.

Septic Systems

You cannot discharge any liquid industrial waste to a septic system. You can only discharge sanitary wastewater to an onsite septic system. You are required to ship offsite your photo processing wastewater, waste fountain solution, process cleaning solutions, and any other waste streams from prepress, press and post press operations. If the industrial wastewater is not regulated as a hazardous waste, you may use a septage hauler that collects septage/wastewater for disposal at a sewer treatment plant. If a septage hauler is not available, it can be shipped offsite as a non-hazardous industrial wastewater to an approved treatment/disposal facility.

Publicly Owned Treatment Works (POTWs)

You may discharge industrial wastewater to a municipal sewer system after receiving

approval from the local sewer authority (or sewer treatment plant). Some industries are ruled by federal “categorical” discharge standards that establish maximum contaminant levels for wastewater from certain processes. However, there is no categorical standard for printers. KDHE regulates the discharges of sewer treatment plants to local surface waters (e.g. rivers, etc.). In turn, the sewer authorities or treatment plants require, through local sewer ordinances, wastewater dischargers to comply with certain discharge limits and sewer use permits. These ordinances are also called “pretreatment requirements for indirect dischargers” (Indirect means the wastewater goes through a sewer system to a treatment plant and does not go directly to a river.)

Local water ordinances can be even more restrictive than the EPA or KDHE requirements, depending on the POTWs ability to successfully treat the contaminants coming to their facility. You are required to determine what local pretreatment requirements are applicable to your shop’s operations. Contact your local sewer authority or sewer treatment plant for information on discharge limits and permit requirements.

What are typical discharge limits?

Regardless of municipality or regional treatment plant, there are usually basic general prohibitions on the types of wastewater that cannot be discharged to the sewer. The prohibitions that may affect printers include:

- DO NOT discharge combustibles/flammables (flash point less than 140°F) down the drain.
- DO NOT discharge malodorous (e.g., rotten egg smell, etc.) wastewater.
- DO NOT discharge any wastewater containing solids (e.g., paper, etc.) that may obstruct the flow in sewers.
- DO NOT discharge wastewater with a pH of less than 5.5 or higher than 10.0. (This pH range will vary according to sewer treatment plant requirements.) There may also be other discharge limits for organic and metal pollutants. The limits most likely to be of concern to a printer are: biological oxygen demand (BOD 5), chemical oxygen demand (COD), Total Suspended Solids (TSS), oil & grease, phenol, silver, copper, and zinc. You should contact your local sewer authority or treatment plant to find out what local limits apply to your print shops wastewater discharge.

Typical sewer codes:

Parameter	Typical	Normal Range
Temp.	150oF	120 to 160oF
pH	5.5 to 9.5	4.5 to 12
SS	350 ppm	200 to 1,000 ppm
BOD45	300 ppm	200 to 1,200 ppm
COD	500 ppm	400 to 2,500 ppm
Cyanide	2.0 ppm	0 to 10 ppm
Phenols	0.1 ppm	0.002 to 20 ppm
Heavy Metal	Typical	Normal Range
Cadmium	0.5 ppm	0.002 to 20 ppm
Chromium	5.0 ppm	0.02 to 25 ppm
Copper	3.0 ppm	0.1 to 10 ppm
Iron	20 ppm	3 to 100 ppm
Lead	0.1 ppm	0.05 to 5 ppm
Mercury	0.0005 ppm	0 to 5 ppm
Silver	2 ppm	0.025 to 20 ppm

How do you get a sewer use permit?

Your local POTW will provide you with a wastewater survey or permit application form to summarize your wastewater (by source, volume, contaminants, and characteristics such as pH, temperature, etc.) before it is discharged to the sewer. You may be also be required to sample and analyze your wastewater, and submit the results with the form. (Note that the location and collection method of the wastewater varies according to the local sewer authority or treatment plant. You should inquire on the proper method and location before you sample.)

After you complete and submit the form, the local sewer authority will decide the need for a sewer use permit. For most printers, permits are generally not required. Larger printers, with large volumes of wastewater discharges or discharges of unique pollutants, usually need permits. If a permit is required, you should read the permit carefully to ensure you understand your obligations. The permit may also require you to sample your wastewater (monthly, quarterly, semiannually or annually) and submit reports. If so, set up a calendar to be sure that you perform the monitoring and prepare the reports on time.

If you do not need a sewer use permit, you are still required to comply with the general prohibitions, and any discharge limits in the local sewer ordinance. Your local sewer authority may still require you to complete an annual Wastewater Survey.

Annual wastewater survey

Your local sewer authority or treatment plant may require you to complete a wastewater survey each year. Review the form carefully and reevaluate the volume and characteristics of the wastewater you discharge to ensure proper reporting. Some sewer authorities may also

require annual wastewater analyses, if you are not already testing the wastewater as required by a permit. Generally, small printers do not have to perform wastewater analyses, and the local sewer authority will accept instead, an estimate of the type and concentration of pollutants in the wastewater discharge.

In some cases industries can discharge hazardous waste to the POTW, under the Hazardous Waste Discharge Notification:

- one-time report due February 1991.
- discharges over 15 Kg (33 lbs)/mo.
 - simple notifications
- discharges over 100 Kg (220 lbs)/mo.
 - identification of constituents.
 - estimate of mass & concentration discharged/mo
 - estimate of each constituent mass discharged/mo

A copy of the RCRA notification form and the regulation is provided in the appendix following the CWA section.

You must first inventory the contaminants that are discharged with wastewaters leaving your facility. The following list outlines many contaminants from printing processes. Keep in mind these wastes or pollutants are from all print sectors, so there will be contaminants listed that your shop may not generate. A wastewater inventory form is provided to track where the contaminant comes from, type of discharge, the applicable regulation for that discharge, regulatory limits, and sampling requirements, if any exists for each contaminant. Keep the inventory form in the water section of your environmental folder as support that you have identified and determined your compliance obligations for each wastewater contaminant from your shop.

Typical wastewater contaminants from printing operations:

PRE-PRESS OPERATIONS

silver contaminated fixer	CWA, RCRA
silver contaminated rinse waters,	CWA
used developer,	CWA
outdated chemicals,	CWA, RCRA
glass/equipment cleaners,	CWA, CAAA, RCRA

IMAGE CARRIER OPERATIONS:

plate developers,	CWA; usually not regulated
plate finisher,	CWA,
water washout from plates,	CWA; usually not regulated
rinse waters	CWA
acid-based plate making waste,	CWA
stencil emulsion,	CWA
chrome plating solution,	CWA, RCRA
copper plating solution,	CWA
nickel plating solution,	CWA
etching solution,	CWA
acid solutions,	CWA, RCRA
basic solutions,	CWA, RCRA

PRESS OPERATIONS

Solvent-soaked shop rags	CWA, RCRA
water-based inks,	CWA, RCRA
fountain solutions,	CWA, RCRA, CAAA
copperizing solution,	CWA
blanket washes,	CWA, RCRA, CAAA
press cleaning solvents,	CWA, CAAA, RCRA
press cleaning wipes,	CWA, RCRA,

POST PRESS OPERATIONS

stencil remover,	CWA, RCRA
haze remover,	CWA, RCRA

MISCELLANEOUS

Wastewater from floor cleaning	CWA
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P2 tips for Wastewater

The implementation of, and conscientious adherence to good pollution prevention operating practices will greatly facilitate compliance with wastewater management requirements.

- Remove as much ink as possible from the ink carrier or transfer equipment before cleaning.
- No wastewater should be disposed of through the outside drains around the building or in the parking lot.
- No chemicals should be dumped from containers or buckets into sinks or floor drains. Containers of used solutions, including waste inks, solvents, lubricants, cleaners, or oils should be disposed of properly via an appropriately designated container as specified under the facility's solid waste handling procedures.
- Facility sinks are to be used primarily for hand washing only.
- Any parts to be washed in the sinks should be allowed to drip dry from any cleaners, solvents, or other chemicals before they are rinsed in the sink.
- In the event of a spill of any kind of chemical material, efforts should be made to prevent the chemical from reaching the floor drains by using absorbent spill containment booms ("pigs") and drying agents.
- In the event a spill reaches the septic system, the facility should call the Small Business Environmental Assistance Program at 800-578-8898.
- In the event a spill reaches drains connected to the sewer system, call your local POTW immediately.

NPDES: discharges to surface waters

KDHE and EPA regulate the discharge of wastewater to rivers, streams, or lakes. You are required to obtain a discharge permit (also called a National Pollutant Discharge

Elimination System or NPDES permit), regardless of the volume or characteristics of the wastewater. NPDES permits require discharges to:

- Treatment is usually required before discharge
- will require extensive wastewater monitoring, testing, and reporting
- require certified wastewater treatment operators

***Note:** If you have no other option for wastewater disposal, and intend to discharge to surface waters, you must submit an application to KDHE to obtain a permit before discharging. The application and approval process is lengthy and resource intensive. You may want to seek a consultant with expertise in these types of permits. You should seriously consider all options before discharging to surface waters. For more information, call your KDHE regional office. See the KDHE district offices listing in the appendix of this section.*

Storm water

Contaminated storm water runoff can have a significant environmental impact. EPA has regulations for the management and permitting of storm water discharges. For printers, two conditions must exist before a storm water discharge permit is required. First, storm water and/or melting snow must come into contact with chemicals or materials that can contaminate it. Second, there must be a natural or artificial conveyance to discharge storm water/melted snow to surface waters such as a river, stream or lake. (Storm water discharged to a municipal sewer system is considered an artificial conveyance.)

At this time KDHE's has not finalized their storm water requirements for industrial dischargers. The only requirement for industrial dischargers is to file a "Notice of Intent" form

for those industries that will be covered by the storm water regulations. However, KDHE has indicated those industries will be required to prepare and implement a Storm Water Pollution Prevention Plan (SWP3) whenever the regulations do become final in Kansas. (A sample NOI form is provided in the appendix of this section.)

Here is a list of storm water contaminant sources generally found at print shops:

- Uncovered ink fill pipes
- Outside fuel dispensing operations
- Onsite fleet vehicle maintenance shops
- Contaminated or oil soaked pallets
- Open compactors or dumpsters (no lids or overhang roofs)
- Compressor and cooling system blow down
- Uncovered loading dock platforms
- Uncovered aboveground storage tanks

- Outside storage of chemicals and empty containers

The simplest way to avoid storm water contamination is to keep all chemical and waste storage and dispensing indoors and contained within the building or construction of a protected shelter. Caution must be exercised around loading docks and parking lots where materials are moved between vehicles and the facility. Whenever possible, such areas should be covered. Shelters can be built for dumpsters, or they can be brought inside. All material transfer should take place over an impervious (paved) surface. Basic precautions such as placing chocks under the wheel of trucks which are being loaded and unloaded are fundamental to reducing the risk of spills. Spill control and clean up supplies (such as “pigs” or Speed-Dri) should be kept available near these areas in case of any spill.

Storm water–Best Management Practices for Printers

Plates & Film	Store inside on pallets or drums before pickups.
Pallets	Do not accumulate; reuse or discard immediately. Store inside, if possible.
Storage Tanks	Locate ink, fuel oil and solvent tanks inside, if possible. Ensure that fill pipes are covered with drip trays. If located outside, use double-wall tanks or cover with roofs.
Empty Drums & Containers	Do not store on loading dock platforms. Store inside.
Dumpsters & Compactors	Use lids or cover with shelters.
Loading and Unloading Chemicals	Do not unload or load during rainstorms. Do not store containers on loading docks.
Outside Spills	Clean up spills immediately.
Vehicle Fueling Operations	Cover dispensers and installed grooved pavement.
Fleet Vehicle Washing	If possible, use biodegradable washes or only pressurized water. Do not wash fleet vehicles (10 or more vehicles) outside. Use an offsite service.
Fleet Maintenance	Perform fleet maintenance activities inside. Do not store parts outside. Install storm drains inside garage connecting to an oil-water separator.

Spent Fixer

Untreated spent fixer from tray development or automated photo processors can contain 1,500 to 5,000 parts per million of silver. Though silver is by far the most common metal found in printers' wastewater, ink pigments such as cadmium, chromium, or copper could potentially contaminate your facility's wastewater.

Allowable silver concentrations (and other heavy metals, e.g., chrome, lead, cadmium, etc.) will be established by your Publicly Owned Treatment Works (POTW). However, Wichita and Kansas City, Kansas printers are required to adopt the Code of Management (CMP) practices for silver rich wastewater dischargers, in lieu of being regulated by a numerical limit for silver content. Check with your local POTW on these limits.

The "*Code of Management Practices Guide for Commercial Imaging*" is provided in the appendix of this section.

If photo processing wastewater is to be discharged to the sewer, all silver-bearing wastes, including fixer, bleach-fix, stabilizers from washless systems and low flow wash water, but not including developer, and bleach, must pass through and be treated by a properly designed and operated silver recovery unit (SRU). Rinse waters may not have to be treated with an SRU depending on the silver concentration, and whether it passes your POTW's silver discharge limits. SRUs must be operated and maintained according to manufacturer's specifications. Records must be kept to show the SRUs are properly operated and maintained.

There are several types of SRUs. The most common are electrolytic, metallic replacement cartridges (steel wool canisters), and ion exchange units. They may be used separately or in combination, but an electrolytic unit alone may be insufficient. If you use an electrolytic unit, it may need to be used in conjunction with a second stage, or second and

third stage, system. Equipment maintenance is the key to properly operating SRUs.

To meet silver discharge limits you should:

- 1) Perform weekly inspections and regular maintenance of SRUs;
- 2) Hazardous Waste Good Management Practices Sample and test the SRU effluent periodically to ensure that the effluent meets discharge limits;
- 3) Mark the date on your cartridges/canisters when you install them;
- 4) Replace cartridges when they no longer remove silver efficiently;
- 5) Keep a log of your cartridge installation and replacement dates; and
- 6) Back flush all metallic replacement units at least three times into an another unit to remove silver-laden solution and allow the unit to be shipped as non-hazardous waste.

Please refer to the CMP manual provided for a detailed description of the different silver recovery technologies and their proper operations, as well as recommended testing and recordkeeping requirements to support compliance.

Sampling Requirements

Your POTW may require periodic sampling for various chemical constituents. Contact your local utility to find out your specific requirements. In addition, if you are using a Silver Recovery Unit (SRU), you must test the effluent from the SRU to ensure that it is working effectively. The appropriate sampling frequency will be specified by your local utility.

If the analysis shows that your treatment equipment is not effectively removing silver, you must take steps immediately to prevent inadvertent discharge of silver contaminated effluent, repair or replace the equipment.

The essential step in satisfying silver (and other heavy metals) environmental requirements is to know your local utility's restrictions and monitor your discharge to ensure you are in compliance with these requirements.

Wastewater Storage

If wastewater is to be sent off-site for treatment, drums containing nonhazardous wastewater should be closed to avoid spills, labeled with the wastewater contents and source, maintained in good condition, placed away from drains and on an impervious surface and inspected weekly for leakage, corrosion, or deterioration.

***NOTE:** Silver-bearing photo processing wastewater is usually considered hazardous waste. If your company is not on sewer, then no industrial process waste (including any photo chemicals, cleaning solutions, waste inks, fountain solutions, or water contaminated with any of these) may be discharged to a septic tank or other onsite sewage disposal system.*

Spills

In the event of a spill, every effort should be made to keep the spill from reaching storm drains and other conduits to bodies of water such as streams or retention ponds. If a spill occurs which may reach such a water body, call SBEAP immediately. Depending on the quantity and the material spilled, regulations may require reporting of the spill to regulatory agencies within 24 hours after its occurrence.

If your facility stores chemicals or wastes outside, (even under an over hang or roofed area with open sides), the containers should be placed on an impervious surface and provided with containment (typically a concrete curb) which will contain at least the volume of the largest container plus an allowance for rainfall. The containment should be allowed to drain only through a pipe equipped with a valve which is kept closed except when collected storm water is being discharged. Prior to opening the valve, the water should be inspected for any sheen, discoloration, or other evidence of contamination. If the water may be contaminated, contact the Small Business Environmental Assistance Program at 800-578-8898 for advice concerning disposal.

KDHE's official spill notification list is provided in the appendix of the following section on storage, releases, and public reporting.