Chapter 3: Wastewater

Printing facilities may generate industrial wastewater from sources including: film and plate processing; spent fountain solution; and water-based inks, coatings, adhesives and cleaning solutions. Wastewater discharged by printers can be classified as either sanitary or Industrial wastewater.

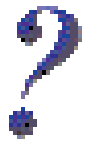
Wastewater Types

Sanitary wastewater is wastewater from restrooms, breakrooms, and sinks used for handwashing and similar activities.

Sanitary wastewater:
- does not include wastes from printing processes or waste fluids poured down drains
- is also referred to as domestic wastewater

Industrial wastewater is wastewater resulting from business activities. This wastewater might contain one or more pollutants.

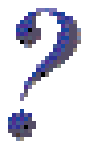
Industrial wastewater:
- includes:
  - ➢ wastewater from printing processes
  - ➢ wastewater discharged through floor drains, catch basins
  - ➢ condenser and blowdown wastewater from air compressors
  - ➢ non-contact (uncontaminated) cooling water (NCCW)
- is a type of non-sanitary wastewater
- is referred to as non-domestic, industrial, or commercial wastewater

	**Question WW.1:** Do you generate any industrial wastewater?	❑ Yes. Move on to Section A. ❑ No. Review only sections A.7, F, G, and H.

Section A: Discharge Requirements

Our facility discharges wastewater. What requirements must be met?

Printing facilities discharge wastewater to three common locations:
- septic system
- municipal sewer or *Publicly Owned Treatment Works (POTW)*
- *surface water* or *groundwater*

	**Question WW.2:** Are you on a septic system?	❑ Yes. Continue with this section. ❑ No. Skip to section A2.

POTW or Publicly Owned Treatment Works is a wastewater system, owned by a municipality, state, or tribe that is used for the collection, treatment, and/or disposal of sewage.

Surface Water is water that sits or flows above the earth, including lakes, oceans, rivers, and streams.

Groundwater is the water beneath the earth's surface that flows through soil and rock openings in an aquifer, and often serves as a primary source of drinking water.

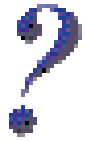
A1. Can Industrial wastewater be discharged to a septic system?

Only sanitary wastewater may be discharged to an on-site septic system. Other wastewater needs to be collected in a holding tank and then hauled away to a disposal facility or rerouted to a municipal sewer system.

Liquid Industrial Waste must not be discharged into any septic system. Examples of Liquid Industrial Waste include: process chemicals; solvents; waste inks; and/or hazardous wastes in liquid form.

The following types of wastewater cannot be discharged to a septic system and must be shipped off-site:

- photo-processing wastewater
- waste fountain solution
- process cleaning solutions
- other water-based waste streams from pre-press, press, and post-press operations

	**Question WW.3:** Do you discharge industrial wastewater to a septic system?	❑ Yes. Cease discharge. ❑ No. Skip to section A2.

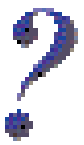
If Industrial Wastewater is tested and determined not to be hazardous waste it may be properly disposed off-site by a septage hauler. DNR lists licensed septic haulers online at **http://www.dnr.state.wi.us/org/es/science/opcert/septagebuslic.htm**. Go to the Operator Certification and Licensing Septage Business License web page, or call the DNR at 608-266-8948.

A2. Can Industrial wastewater be discharged to a municipal sewer system?

Discharge of sanitary wastewater to a municipal sewer system is allowed. Industrial wastewater may be discharged to municipal sewer systems and/or POTW provided it meets local sewer authority standards and requirements.

Printers should note:

- standards vary with locality
- requirements may include wastewater analysis by a laboratory
- a discharge permit might be required

	**Question WW.4:** Do you discharge industrial wastewater to a POTW?	❑ Yes. ❑ No. Skip to section A4.

Printers are responsible to know and meet local requirements. Contact local sewer authority to evaluate wastewater discharge and review all requirements In most circumstances, when printers meet the requirements and standards of local POTW no additional requirements must be met for environmentally-safe

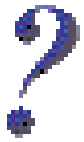
discharge of Industrial wastewater. There are certain general prohibitions regarding Industrial wastewater discharge that printers should review.

A3. General Prohibitions

You are not allowed to discharge pollutants with the following characteristics:

- pollutants that create a fire or explosion hazard in the sewer or treatment plant
- pollutants that cause corrosive structural damage to the sewer or treatment plant, and in no case with a pH lower than 5.0 (check with your local POTW for the upper pH limit)
- pollutants that cause obstructions in the sewer or treatment plant.
- petroleum oil, cutting oil or mineral oil in amounts that will cause interference or pass-through
- pollutants resulting in the presence of gases, vapors, or fumes in the sewer or at the treatment plant which may cause worker health or safety problems.
- trucked or hauled pollutants, except at the discharge points designated by the treatment plant
- discolored wastewater (i.e. waterbased inks), unless an ink water separator is used and the solids are landfilled

Ph: describes a characteristic of wastewater. A pH of 7 is neutral, less than 7 is acidic, greater than 7 is alkaline/basic.

	**Question WW.5:** Are you in compliance with the POTW's sewer use code and requirements?	❑ Yes. ❑ No.

A4. Can Industrial wastewater be discharged to Surface Water or Groundwater?

Liquid industrial waste and industrial wastewater may not be discharged to any surface water body (e.g. streams, lakes, rivers), to groundwater, or directly on the ground, without a Wastewater Discharge Permit from DNR.

Direct discharge of Industrial wastewater to surface water and/or groundwater is generally prohibited. Printers discharging Industrial wastewater to surface or groundwater must contact the DNR or an environmental professional immediately. They can suggest acceptable options for collection, storage, and/or treatment of printing process and other Industrial wastewater.

A5. Uncontaminated, Non-Contact Cooling Water

What are requirements for discharging uncontaminated, Non-Contact Cooling Water?

Uncontaminated Non-Contact Cooling Water (NCCW) is water used to cool equipment, operations, products, or materials which has no physical contact with equipment, operations, products, or materials.

The following questions will help you determine requirements for your printing facility:

Does your facility discharge NCCW to surface water or groundwater?
If NCCW is discharged to surface water or groundwater, you must obtain a permit from the DNR. DNR staff will evaluate each facility and situation.

Are there any exceptions to permitting NCCW discharge?
Yes. Printers who participate fully in the Environmental Results Program (ERP) are allowed to discharge NCCW without obtaining a wastewater discharge permit if the following criteria are met:

- the NCCW is not contaminated with biocides or other chemical treatment additives
- the NCCW discharge to ground surface is in small quantities of 5 gallons or less per minute
- surface discharge is absorbed into the ground before reaching any surface water body
- the facility submits the ERP self-certification form to DNR

Does your facility discharge NCCW from a system requiring chemical treatment such as a closed system flush?
Printing facilities discharging NCCW to any surface water or groundwater from a system requiring chemical treatment must obtain a Wastewater Discharge Permit from the DNR.

A6. Discharge to Surface Water or Groundwater

What must be done to meet requirements for discharging wastewater to surface water or groundwater?

- obtain a WPDES Permit before discharging any wastewater to surface waters
- ensure floor drains are not connected to a storm sewer that empties to a ditch, river, stream, or other body of water
- plug any floor drain (e.g., with concrete) that does not discharge to a POTW or a holding tank

A7. Vehicle Wash Water Discharge

What are the requirements for discharging vehicle wash water?

General Permit: Outside Washing of Vehicles, Equipment and Other Objects (WI-0059153-1)

Washing vehicles produces wastewater. Wastewater from vehicle washing not discharged to a POTW or holding tank for off-site disposal must be discharged in a manner meeting the requirements of a General Permit for vehicle washing. Review this General Permit online at: **http://dnr.wi.gov/org/water/wm/ww/gpindex/gpinfo.htm.**

The following are some of the requirements related to vehicle wash water:

- use only biodegradable detergents (in minimal amounts producing no visible foam to surface water)
- control suspended solids (maximize infiltration of washwater or effectively remove suspended solids with appropriate settling treatment)
- control oil and grease (no visible oil sheen)

- do not use degreasers (unless non-petroleum based)
- do not discharge to any *Outstanding or Exceptional Resource Waters* (i.e., trout streams) in Wisconsin. Discharge to such Waters is prohibited.
- direct wastewater to grass, soil, or gravel rather than a storm sewer if discharged out of doors. Grass, soil, or gravel will filter contaminants from the wastewater. Storm sewers may lead directly or indirectly to surface water without filtering or other treatment.

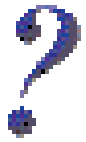
Go to: **http://dnr.wi.gov/org/water/wm/wqs/orwerw/** for information on **Outstanding or Exceptional Resource Waters.**

	**Question WW.6:** Do you discharge industrial wastewater to the ground, or surface water without a permit?	❑ Yes. Cease unpermitted discharge unless you meet all exception criteria in section A.5 and/or meet the requirements in section A.7. ❑ No.

Section B: Non-Hazardous Industrial Wastewater Storage

Can non-hazardous wastewater be stored in a holding tank, drum, or container?

Yes, storage of non-hazardous wastewater in tanks, drums or containers is allowed. However, if the wastewater is tested and determined to be hazardous waste, it must be stored according to the hazardous waste requirements in Chapter 3 of this workbook.

	**Question WW.7:** Do you store non-hazardous wastes in tanks, drums, or containers?	❑ Yes. ❑ No. Skip to section E.

Even if wastewater is non-hazardous there are certain requirements that must be met when storing in drums or containers:

- ensure materials are not subject to United States Department of Transportation (US DOT) shipping requirements
- use containers that meet US DOT shipping requirements for all materials with a flash point less than 140 degrees
  - ➢ containers meeting US DOT shipping requirements have greater than 5 gallons capacity only and are stamped or printed with the UN symbol and an 18-22 character alphanumeric code
- label containers indicating contents are non-hazardous

When storing wastewater in drums or containers you should:

- keep records for each shipment. Include: volume shipped; transporter's name and address; dates of shipment; and destination(s). Retain records for three years.
- check with your transporter to make sure you comply with any US DOT shipping requirements

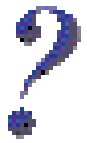
When storing wastewater in *holding tanks* you must:

- use a watertight tank constructed of material compatible with the wastewater contents; the tank must have a manhole, vent, and high-level alarm
- obtain DNR approval for any new tank by completing a self-approval form available from the DNR Watershed Bureau (608-267-7694)
- use a licensed DNR hauler to pump and haul wastewater from holding tanks
- prevent spillage during filling or emptying; report any spill of wastewater to the environment to the DNR

When storing wastewater in holding tanks you should:

- locate above-ground tanks within buildings in a secured area with an impervious floor to contain leaks and *spills*
- surround holding tank(s) with a secondary containment structure capable of retaining 110% of the total volume of all aboveground tanks
- apply odor control
- label tank(s) indicating the contents are non-hazardous
- install bell and alarm for remotely or automatically filled tanks
  - ➢ The alarm should activate when liquid level reaches 75% of tank capacity.
  - ➢ The alarm should transmit to a staffed location.
- manually filled tanks should be provided with visual or sight glass level measurement

Holding tanks are waterproof containment vessels (usually less than 5,000 gallons) made of steel, concrete or other material.

	**Question WW.8:** Are you in compliance with the requirements for storing non-hazardous wastes in tanks, drums, or containers?	❑ Yes. ❑ No. Submit RTCP.

Section C: Evaporator Use

See Chapter 5, for reporting and other information about **spills**.

Can an Evaporator be used to reduce Wastewater volume?

Facilities can use an evaporator to reduce the volume of non-hazardous wastewater before shipping offsite. No wastewater permit is required.

Evaporator sludge must be tested to determine if it is a hazardous waste that requires proper offsite shipment. All test results should be kept on file. If your wastewater is determined to be hazardous, you must comply with the hazardous waste handling requirements found in Chapter 2.

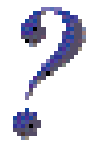
Section D: Disposing of Hazardous and Non-Hazardous Industrial Wastewater

How can wastewater be shipped off-site?

Non-hazardous wastewater may be hauled to a wastewater treatment plant by a septage hauler. Written approval from your local sewer authority or treatment plant is required.

Hazardous wastewater must be shipped by a licensed transporter. Check your local yellow pages for recycling or precious metal recyclers.

- silver-bearing wastewater may be shipped using a precious metals transporter
- non-hazardous developer and rinse water may also be shipped by a precious metals transporter

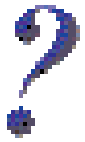
	**Question WW.9:** Do you ship/haul your untreated silver bearing waste off-site for recycling?	❑ Yes. ❑ No. Submit RTCP.

Section E: Signs in Your Facility

What signs must be posted in printing facilities?

DNR recommends that a warning sign be posted at every sink in the prepress, press, and postpress areas. Two sample warning signs are provided on ink the Magenta Ink Room section of this workbook.

One sign is for use in shops on septic systems and the other sign is for use in shops on sewer systems. Copy the signs as many times as needed. Place the sign in a sheet protector and post above the sink to remind employees that process chemicals, solvents, waste inks, and/or hazardous wastes must not be poured down the sink or drain.

	**Question WW.10:** Do you have warning signs posted at every sink in the prepress, press and post press areas warning employees not to put hazardous wastes, process chemicals, solvents, and waste inks down the drain?	❑ Yes. ❑ No. Post appropriate signs.

Section F: Silver Recovery Units

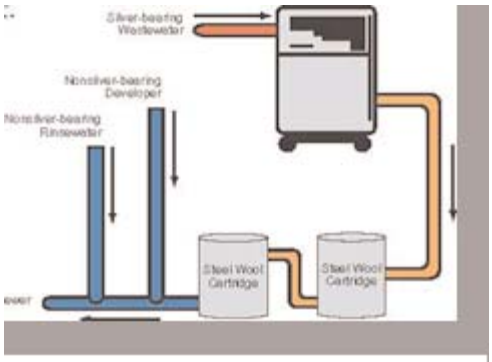
Should I Use a Silver Recovery Unit (SRU)?

A Silver Recovery Unit (SRU) is a system that removes silver from the printing waste stream.

	**Question WW.11:** Do you do perform photo processing, plate imaging or other operations that generate a silver bearing wastewater?	❑ Yes. ❑ No. Skip to section G.

Although photoprocessing wastewater contains silver, it may be discharged to a municipal sewer if it has been pretreated to remove silver to meet the local sewer code or permit limit. Photoprocessing wastewater may not be discharged to any septic system.

Does your local *sewer code* or permit limit silver discharge amounts?



Typical Silver Recovery Unit

If your facility is required to meet a silver discharge limit, the best option is to install an SRU. Printers should consider the following when choosing and installing an SRU:

- choose an SRU designed to handle the volume of wastewater you must treat
- common types of SRUs are electrolytic, steel wool cartridge, and ion exchange
- different types of units may be combined or used separately
- depending on the silver discharge limits in your area, an electrolytic SRU alone may not be adequate
- manufacturers can assist printers to choose SRUs that will handle wastewater volume and meet silver removal limits

SRUs must be operated, serviced, and maintained according to manufacturer's specifications. Printers should address the following questions:

- How will operation, service, and maintenance of the SRU be done?
- Which employees will be responsible? Although SRU operators are not required to be certified, it is recommended that employees responsible for the operation of SRUs be trained by the manufacturer or supplier. Your local sewer authority may require you to document this training.

	**Question WW.12:** Do you have an SRU?	❑ Yes. Make sure you follow the Hazardous Waste requirements for recycling **Precious Metals**. ❑ No.

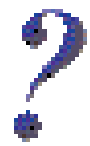
Sewer Code is a local ordinance that regulates the discharge of wastewater.

Section G: Computer to Plate Systems

My facility uses a Computer-to-Plate system. What are the requirements?

In recent years, *Computer-to-Plate* (CTP) imaging systems have become common. CTP uses digital technology, eliminating film processing and the environmental compliance challenges associated with film, effluents, and silver. As a result, many printers assume CTP is environmentally safe and "green."

A Computer-to-Plate (CTP) system allows for the direct imaging of printing plates from digital files. This enables the printer to work in a completely digital workflow.

	Question WW.13: Do you generate CTP wastes?	❑ Yes. ❑ No. Skip to section H.

CTP systems are either "liquid" or "dry," depending on how the plates are developed after being imaged. However, both systems use lasers to produce images on printing plates and have environmental issues, compliance concerns or impacts that must be addressed.

CTP Processes, Issues, or Compliance Concerns, and Solutions

Liquid Systems

Liquid systems use thermal (heat) lasers or visible (white) light lasers to create images on plates. Liquid used in these processes produces effluent (waste liquid) with a high pH. In some systems, the pH is greater than 12.5. This is so high that the effluent would be considered hazardous waste. This effluent must be neutralized to lower the pH level prior to discharge. If sent offsite for disposal, neutralization will allow the waste to be classified as non-hazardous.

CTP System	Environmental Issue, Compliance Concern	Solutions for Liquid Systems
• Liquid: Thermal • Liquid: Visible Light	pH of effluent can be > 12.5	**Neutralization** Neutralize effluent prior to discharge or sending offsite to avoid being classified as hazardous waste.
Liquid: Visible Light	Silver halide used in process leaves Silver in effluent	**Silver recovery** Use particulate filters to remove silver from effluent. Check with sewer authority to determine local silver discharge limits. **Evaporation** Silver recovery cartridges for evaporators must be back flushed three times prior to shipping offsite.

Computer-to-Plate (CTP) imaging systems, based on lasers, enable the printer to directly image plates with high-quality images. CTP process eliminates the film developing step and the wastewater it generates.

Dry Systems

Dry systems use thermal lasers to remove the coating on a printing plate, thereby creating an image. This process is called ablation. As the coating is removed, particulates and vapor are discharged into the air, causing a potential health hazard.

CTP System	Environmental Issue or Compliance Concern	Solutions for Dry Systems
Dry System: ablation	air-borne particulates and vapor from coating can be a health hazard	Filter air during ablation process. Imaging unit must be vented and emissions filtered to capture by-products. If plates are wiped with alcohol prior to mounting plate to press, rags or wipes used for this purpose must be managed and disposed of properly. See Chapter 2, section B4, of this workbook.

What if Wastewater is discharged to a septic system?

Discharge of Industrial wastewater to any septic system is forbidden under any circumstances. The only option is to send the waste offsite for disposal.

If waste is neutralized prior to sending offsite, reducing the pH to less than 12.5, then it can be shipped as a non-hazardous waste. Waste with a pH greater than 12.5 is considered hazardous waste and disposal must comply with all appropriate hazardous waste requirements.

If effluent contains silver, the concentration must be reduced to less than 5 parts per million to be shipped as a non-hazardous waste.

If Waste is shipped offsite for disposal, can the volume and resulting costs be reduced?

Yes, neutralized effluent may be reduced using an evaporation unit. This will reduce the volume of waste and result in lower disposal costs. All neutralization and silver recovery must be done prior to volume reduction.

Does a CTP system require a Wastewater Discharge Permit?

A **dry system** is included here for your information as an alternative CTP system. While the dry system doesn't generate wastewater, the air pollution generated is not vented outside and therefore would not be regulated under air pollution rules.

Prior to installing a CTP system, the local sewer authority should be contacted to determine if any local permits are required.

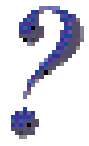
Does neutralization and silver recovery for CTP System waste require a DNR Hazardous Waste Treatment Permit?

No. Under the current Federal EPA hazardous waste rules and Wisconsin DNR regulations, elementary neutralization and silver recovery are exempt from hazardous waste permitting requirements. No notification is required.

Local municipalities or POTWs may regulate or require permits for silver recovery or neutralized effluent. Check with your local POTW for any requirements

When managing silver recovery cartridges, printers must ensure that recovery cartridges are back-flushed three times prior to being shipped offsite. Otherwise, solution remaining in the recovery cartridges could be classified as a hazardous waste because it could contain more than 5 parts per million of silver. For more information on why silver is classified as a hazardous waste go to page HW-4 of the Hazardous Waste chapter.

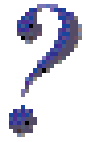
For more information about CTP systems and the environmental issues associated with them, you can find a fact sheet at the Printers' National Environmental Assistance Center (PNEAC):
http://www.pneac.org/sheets/pdfs/CTPEnvFactSheetPNEAC.pdf

	**Question WW.14:** Are you meeting the CTP requirements?	❑ Yes. ❑ No. Submit RTCP.

Section H: Best Management Practices

The following best management practices are not required, but are highly recommended. Please indicate where you have taken action as recommended (Done), where you might want to take action (Needs Attention), or if the area doesn't apply to your shop or operations (Not Applicable).

Process	Done	Needs Attention	Not Applicable
Keep your facility clean. Prevent spills and leaks that might contaminate floor rinse waters.			
Pre-clean equipment such as water-based ink, coating, and adhesive application units by wiping excess materials off prior to washing.			
Train staff in good housekeeping skills. Schedule time to clean-up materials at the end of each day.			
Minimize water usage. Using less water means less wastewater to manage.			
Recover silver from photo-developing wastewater, waste fixer and computer-to-plate chemistry, if applicable, and save some money!			
Run a Dry Shop: A dry shop uses no water, or very little water, to clean floors. Do not wash the floors or use wet mops to clean up spills. Clean up small spills with rags. Do not saturate rags. For solvent spills, use appropriate absorbents to clean up the spill and dispose of the absorbents as hazardous waste.			

	**Question WW.15:** Have you adopted any of the recommended BMPs?	❑ Yes. ❑ No. Recommended.