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-- FACT SHEET --
SCREEN PRINTING WASTEWATER

This fact sheet presents general guidance regarding the management of screen printing wastewater. If you follow the intent of the Best Management Practices (BMPs) you may discharge your wastewater to the Metro sanitary sewer.

These guidelines are important because Metro must protect the health and safety of those who collect and treat wastewater. Metro also ensures that municipal treatment plants operate effectively, that biosolids (sludge) from these plants is not contaminated, and that federal and state water quality and hazardous waste regulations are complied with. To accomplish this, Metro develops discharge limitations and best management practices for industrial wastewater discharges.

If your wastewater has different characteristics than those described in this fact sheet, or you have other questions call the Business Waste Line at 296-3976.

Background

Screen cleaning operations may generate wastewater that is disposed of in the sanitary sewer. About 75% of screen print shops generate wastewater. Out of 22 randomly selected King County shops, 7 did not generate wastewater, each of the 15 shops that generated wastewater was sampled. The volume and characteristics of wastewater varies among shops. Volumes range from 0.5 to 170 gallons/day. Characteristics of wastewater depend on the inks used, the products used to clean screens, and the cleaning procedure.

Metals

Metals are found in some ink pigments. In general, textile printers use inks that are free of lead pigments. Sign, poster, label and electronic component printers tend to use solvent-based inks that may contain lead pigments. Lead, copper, chromium and zinc were found in screen printing wastewater. Metals discharged to the sanitary sewer end up in biosolids produced in the municipal treatment plant. These biosolids are spread on forests, farms and made into compost for commercial and residential landscaping. Metals in the biosolids must be maintained at acceptable levels or the use of biosolids will be restricted and disposal costs could sharply increase.

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SCREEN PRINTING WASTEWATER (continued)

Solvents

A variety of products are used to clean and reclaim screens. Many printers use solvents to clean screens in the process area and there are significant levels of solvents in some wastewater samples. Solvents are also present in some inks.

Volatile solvents used to clean screens include: acetone, methyl ethyl ketone (MEK), toluene, xylene, ethyl benzene, cyclohexanone, mineral spirits, naphtha, and lacquer thinner. Chlorinated solvents include: methylene chloride (dichloromethane), and methyl chloroform (1,1,1 trichloroethane). Other common solvents include: safety solvent (petroleum distillates with a flash point > 140° F), cellosolve acetates, and glycol ethers.

Most citrus-based cleaners contain d-limonene. Those that contain up to 95% d-limonene and have flash points of about 130°F should be managed as volatile solvents. Other citrus-based cleaners contain lower concentrations of d-limonene and have higher flash points. At this time, it is not known if these alternatives present lower environmental risks than the solvents which they replace. Research regarding appropriate waste management practices for citrus-based cleaners is underway.

Volatile solvents, which vaporize readily into the air, present health and safety hazards to collection system and treatment plant workers. Most volatile solvents discharged to the sanitary sewer are released into the air, either in the sewer or at the treatment plant exposing workers to solvent vapors. Sometimes an explosive atmosphere is produced that could result in loss of life and equipment damage. Since a sanitary sewer is not designed to treat volatile solvents, the discharge of these is restricted.

Wastewater Best Managment Practices

The following screen printing wastewater best management practices were developed after sampling shops, observing shop practices, reviewing product constituents (using MSDS information), and reviewing Metro sewer discharge regulations and WAC 173-303 Dangerous Waste Regulations. To reduce the amount of metals and solvents discharged to the sewer, follow these guidelines.

References:

Metro Industrial Waste Local Limits, November 1990
Code of Federal Regulations (CFR) Title 40, Part 261, Identification of Hazardous Waste
Washington Administrative Code (WAC) Chapter 173-303, Dangerous Waste Regulations
Product MSDSs

Wastewater Best Management Practices

- **Under no circumstances should you discharge industrial wastewater to a storm drain or on the ground.**

- **If you follow these practices you may discharge your wastewater to the Metro sanitary sewer.**
  - If you are not in the Metro service area then contact your sewerage agency for guidance. (To determine your sewerage agency call the agency that sends you your water bill.)
  - If you discharge wastewater to a septic system, contact the Washington State Water Quality Program, Septic Treatment Coordinator on 438-7037 for advice.

- **Remove as much ink as possible from screens before washing them.**
  - Don't dispose of excess ink down the sewer. Squeegy off excess ink and return it to the original container. Wipe off the remaining excess ink with a rag. (See the rag fact sheet for guidance on used rag management.)
  - Minimize the use of inks containing lead, copper, chromium and zinc pigments. Ask other printers if they have found alternatives. Contact your suppliers and ask for inks which do not contain these metals.

- **Keep solvents out of sinks that drain to the sewer.**
  - Use alternatives to volatile and chlorinated solvents when possible.
    - Ask other screen printers, doing similar work, what alternative cleaners they have tried and what results they observed. Ask suppliers for alternative cleaners that do not contain volatile or chlorinated solvents.
  - Remove excess solvent from screens prior to water washing them in a sink that discharges to a sanitary sewer.
    - Dry screens prior to water washing. Don't place screens that are dripping solvent in a sink that discharges to a sewer.
    - Don't solvent clean screens in a sink that discharges to a sewer. Install a separate solvent cleaning station.
  - Don't dispose of excess solvent down the drain.

- **Keep worker health and safety, fire department, air pollution, and solid waste regulations in mind when evaluating process alternatives.**
  - Contact the appropriate agency to discuss potential process changes before you make them. For example, if you put in a new solvent cleaning station ensure that it is acceptable to WISHA, PSAPCA and your fire department.