Guide to Managing Wastewater

Post-Secondary Studios
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This guide was developed with the cooperation of and input from staff in the region’s post-secondary institutions. Metro Vancouver wishes to thank Emily Carr University of Art & Design for allowing us to use images of their operations for demonstration purposes.

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Introduction

Post-secondary institutions provide an important service in the education and training of students and Fine Arts studios are integral to advancing higher learning.

Some of the materials found in the wastewater from fine arts studios in post-secondary institutions can damage the wastewater system and pose a risk to fish and the natural environment. Metro Vancouver has created this guide to help post-secondary studios manage their wastewater safely and responsibly.

This guide will be of interest to fine arts studios that do ceramics, painting, jewelry and metalsmithing, and photo processing in post-secondary institutions.

This guide explains the current regulatory requirements of the Sewer Use Bylaw, as well as non-regulatory pollution prevention practices.
Metro Vancouver and the Wastewater System

Metro Vancouver is the regional government that represents 21 municipalities, one treaty First Nation, and one electoral area in the Greater Vancouver area. Metro Vancouver provides an important service to the region, collecting and treating wastewater to protect the environment and public health.

The wastewater system consists of private, municipal and regional trunk sewers that convey wastewater for treatment at one of five regional wastewater treatment plants. The treatment plants are regulated by the provincial and federal governments.

Metro Vancouver relies on a range of tools, including codes and bylaws, education programs and guides to reduce or eliminate wastewater pollutants at their source.

In Metro Vancouver, there are an estimated 6,400 km of private sewers, 7,100 km of municipal sewers and 530 km of Metro Vancouver regional sewers. The entire wastewater treatment system is approximately 14,000 km in length – that’s the total distance from Vancouver to Halifax and back.
Pollution Prevention

The goal of pollution prevention is to eliminate the causes of pollution rather than treat waste once it is generated. Pollution prevention involves continuous improvement through design, and technical, operational and behavioural changes. It also encourages transformations that are likely to lead to lower costs, increased efficiencies and more effective protection of the environment.

Pollution prevention practices and techniques focus on areas like substances of concern, efficient use and conservation of natural resources, on-site reuse and recycling, operating efficiencies, training, procurement techniques, process changes, and equipment modifications.
Existing Regulations

Provincial Acts and Regulations

HAZARDOUS WASTE REGULATION

Waste that is classified/defined as hazardous waste must be managed according to the rules and standards set out by the Environmental Management Act and the Hazardous Waste Regulation.

Wastes may be “hazardous” for many different reasons:

• They are corrosive, ignitable, infectious, reactive and toxic (the “acute” hazard characteristics).

• They have the potential to harm human health or the environment in a subtle manner over long periods of time (the “chronic” hazards).

• They may range from paints, oils and solvents to acids, heavy metal-containing sludges and pesticides.

Under Section 39 of the Hazardous Waste Regulation, “hazardous waste must not be deposited or discharged into any system operated by a municipality… A person must not deposit or discharge or allow or cause hazardous waste to be deposited or discharged into any system of waste disposal operated by a municipality or other public authority unless the deposition or discharge is expressly authorized by a permit, approval, order, regulation or a waste management plan approved by the minister.”
Metro Vancouver Sewer Use Bylaw

Under the provincial Environmental Management Act, Metro Vancouver is authorized to regulate the discharge of waste into its own sewers and into sewers owned by its member municipalities through a Sewer Use Bylaw.

The purpose of the Bylaw is to:

• protect sewers and sewage facilities;
• protect biosolids quality;
• protect human health and safety;
• assist Metro Vancouver’s efforts to remain in compliance with provincial and federal laws and regulatory instruments; and
• protect the environment.

PROHIBITED WASTES

Schedule “A” of the Sewer Use Bylaw specifies wastes that are prohibited from discharge to any sewer or sewage facility.

Hazardous Wastes

The Bylaw prohibits the discharge of hazardous waste as defined by the BC Hazardous Waste Regulation. Hazardous wastes, including solvents and acids, can be generated at a cross-section of fine arts studios on a post-secondary campus.

RESTRICTED WASTE

Schedule “B” of the Sewer Use Bylaw specifies wastes that are restricted in the amounts that can be discharged to a sewer. All dischargers must comply with these restricted waste criteria or be regulated further, through a permit or sector-specific regulation.

Reminder

It is illegal to dilute samples with water to meet restricted waste criteria.
SPILL REPORTING

Spills of untreated chemicals or other contaminants can potentially have serious impacts on sewer infrastructure and human and environmental health. Contaminants of significant concern are listed under the Prohibited Wastes specified in the Sewer Use Bylaw. These contaminants include:

- flammable wastes;
- explosive wastes; and
- specific hazardous wastes that can cause significant risk to worker safety and infrastructure integrity, including pH wastes less than 2.0 or greater than 12.0.

A spill greater than five litres of any of these wastes to the sanitary sewer must be reported to municipal and Metro Vancouver staff in a timely manner.

For other contaminants, the threshold for reporting can be found in the Schedule contained in the provincial Spill Reporting Regulation.

The Sewer Use Bylaw requires that spills that may enter the sanitary sewer be reported at the first available opportunity.

Metro Vancouver 24-hour Spill Line

604-643-8488

Report any spills that have entered (or may enter) the sanitary sewer system.

CODE OF PRACTICE FOR PHOTOGRAPHIC IMAGING OPERATIONS USING SILVER

Schedule “H” of the Sewer Use Bylaw sets out requirements for managing the discharge of ‘silver-rich’ solutions to sanitary sewer. The Code of Practice requires the use of silver recovery technologies to treat ‘silver-rich solutions’ prior to discharge to sanitary sewer. These systems are commercially available and recover the silver, usually in cartridges. An alternative is to contract a third-party waste management company to properly manage these wastes.
Pollution Prevention Practices

Overview

Pollution prevention practices help studio users reduce the amount of contaminants discharged to the environment, comply with regulations and improve overall waste management practices.

The following practices can help studio managers comply with existing regulations, decrease contaminants entering the sewer system, and improve operations through the application of pollution prevention principles. Post-secondary institutions are also encouraged to influence suppliers by requesting and purchasing less toxic, alternative products and buying from suppliers who accept materials and containers back for recycling.

Wastewater from Fine Arts Studios

In the process of creating art, contaminated wastewater is often produced. The wastewater may be contaminated with solids that could block sewer pipes or contain chemical contaminants that could impact sewer infrastructure or human and environmental health.

Wastewater containing hazardous products, labeled with the words ‘Danger’, ‘Warning’, ‘Caution’ or ‘Poison’ should not be poured down the drain. Mop water from studio floor cleaning is usually acceptable for disposal to the sewer as long as chemical spills are cleaned up first.

i. Ceramics

Wastewater containing high solids is generated during preparation and shaping processes. Procedures should be put in place to separate much of the solids prior to disposal down the drain. To keep these solids from entering the sewer system, solids interceptors should be installed and properly maintained to capture any solids that enter the drain, to ensure that the discharge meets the 600 mg/L restriction for total suspended solids in the Sewer Use Bylaw.

Glazes and stains may consist of many chemicals and materials, some of which would be considered hazardous, including those that contain these metals: antimony, barium, cadmium, chromium, cobalt, copper, lead, manganese, selenium and vanadium.
If the glaze has toxic chemicals, or if you are not sure if it does, an option would be to put it in a bowl of bisque and fire it. This will lock in the toxins permanently and then the piece can be disposed of in the regular garbage. If firing the toxic glazes isn’t an option, treat it as hazardous waste for disposal using an appropriate off-site waste management company.

Before doing business with an off-site waste management company, ask for references and make sure to check them. Also ask questions about their recycling and disposal practices. All hazardous waste collected by the off-site waste management company should be delivered to a site authorized by the provincial or federal government. Always keep copies of all your transactions.

ii. Jewelry and Metalsmithing

Water is used to rinse pieces of jewelry between the various steps involved in casting, stripping, cleaning and plating operations. The following hazardous products can be used in the various steps of jewelry making:

- Corrosive degreasers;
- Flammable cleaning solvents;
- Cancer-causing degreasing solvents;
- Toxic tarnish removers and sealants;
- Corrosive etchants and pickle compounds;
- Corrosive and toxic patinas; and
- Poisonous cyanide electroplating compounds.

Since the wastewater generated from the use of these products is generally considered harmful to human health and the environment, it is important to manage it safely. If you generate wastewater through the use of any of these products, treat it as hazardous waste for disposal using an appropriate off-site waste management company.
iii. Painting

The use of paints in arts studios can range from set painting in the drama department to the creation of canvasses in the fine arts studios. Each of these areas can use hazardous materials, such as:

- Turpentine, paint thinner, lacquer thinner, citrus solvent and other toxic and combustible solvents;
- Flammable and toxic spray fixatives and adhesives;
- Pigment powders and pastel sticks containing toxic metals like antimony, cadmium, lead and nickel; and
- Toxic driers in aqua oils and other products.

Pollution prevention techniques to manage painting wastes include:

- Brush washing:
  - Wipe excess paint from brush.
  - Soak the brush vertically in paint thinner or water inside a container.
  - Cover with a plastic lid that has slits cut in it that brushes can slide through.
  - Settle the pigments.
  - Decant the good thinner into a second settling container so it can be used again.
  - Pour the pigment sludge into a waste container for eventual disposal.
- Dispose of partially full containers of aerosols, paints, solvents and adhesives as hazardous waste.
- Rags contaminated with oils should be wrung out and then hung to dry. Once dry, dispose of in the regular garbage.
- Rags that are slightly contaminated with solvents can be disposed of in the regular garbage, once they are dried.
- Collect rags that are visibly wet with flammable solvents in a metal container with a tight-fitting lid and dispose of as hazardous waste.
Resources


GVS&DD Sewer Use Bylaw No. 299, 2007
(the “Sewer Use Bylaw”)

*Code of Practice for Photographic Imaging Operations* (Schedule “H” of the Sewer Use Bylaw)

*Provincial Spill Reporting Regulation*

*Pesticides & Pest Management website*

*Canadian Biosafety Handbook*