

FACT SHEET

Pollution Prevention Tips – Hazardous Wastewater



Department of
Environmental
Conservation

Online Resources Available for Facilities to Reduce Hazardous Wastewater Generation

NYSDEC's Pollution Prevention (P2) Unit is offering guidance and resources for finding easy-to-implement measures to reduce hazardous wastewater at the source.

What is Hazardous Wastewater?

Due to its availability and versatility, water is used for a wide variety of industrial purposes. These can include rinsing, cooling, dilution, or facilitating a manufacturing process. Regardless of its use, water that is used in an industrial setting may become contaminated with substances that result in it becoming a [hazardous waste](#).

Common examples of hazardous wastewaters include:

- Plating wastewater contaminated with heavy metals
- Cooling water contaminated with heavy metals from machining processes
- Corrosive etching and pickling wastewaters from surface treatment processes
- Manufacturing process waters contaminated with ignitable solvents (see [Solvent Use Fact Sheet](#) for help reducing solvent waste streams)

Once a wastewater becomes hazardous, it can pollute the environment if not managed properly. Even if wastewater is managed in compliance with regulations, the substances that cause the wastewater to be considered hazardous still pose an increased risk of causing environmental harm if released. Therefore, it is best to minimize the generation of hazardous wastewater by using alternative chemistries or processes that reduce the quantity of hazardous waste at the source.

What about on-site treatment? Treatment is acceptable in some circumstances, but other methods such as source reduction and recycling are preferred as treatment carries more risks for the environment by comparison. To illustrate this point, consider that treatment can require the purchase of costly and often hazardous treatment chemicals that need to be formulated, transported to the site, stored on-site, and added manually to a treatment unit. Additionally, this method often relies on the use of chemical reactions (e.g., precipitation, neutralization, etc.) that can result in unreacted hazardous compounds that can be passed through treatment into the environment and can also generate hazardous sludges that need to be managed in accordance with regulations. Further, treatment of hazardous wastewaters may consume significant amounts of energy and require additional permits in some cases.

KEY POINTS

Wastewater Reduction

Companies can reduce the quantity of hazardous wastewater they are generating by doing the following:

- *Chemical Substitution* – compare material properties to find non-toxic alternatives
- *Process Modification* – change operating parameters to reduce the amount of water used
- *On-site Recycling* – reclaim process waters and monitor parameters to maximize reuse opportunities

Pollution Prevention Resources

There are a number of ways that facilities can minimize or completely eliminate the generation of hazardous wastewater. The following concepts can provide a starting point for facilities looking to minimize hazardous wastewater at their facilities:

Chemical Substitution – Process water may become a “characteristic” hazardous waste by coming into contact with toxic compounds, such as heavy metals, which are widely used in industrial applications because of their physical properties. However, in many cases there are non-hazardous materials with similar properties that can serve as substitutes, such as lead-free solders and ceramics and cadmium-free electrical components. Heavy metals may also be considered the “industry standard” in certain applications, such as hexavalent chromium used in metal plating. However, there are less-toxic alternatives like trivalent chromium (*see note below), that may lead to better environmental outcomes.

Process Modification – Many processes use large volumes of water for rinsing contaminants away during processing. However, the quantity of water used can often be reduced by changing a system's operating parameters. For example,

increasing the temperature of a rinse to increase solubility or conducting the rinse with a high-pressure spray can reduce the amount of water required. In metal finishing applications, switching to counter-flow rinsing, implementing simple changes like flow restrictors, and increasing the drainage (or “hang”) time of a work piece can reduce wastewater flows.

On-site Recycling and Reuse – In some cases, waters used in industrial processes can be reclaimed and reused for several cycles before being considered “spent”. Water recirculation systems can vary in their complexity but can be simple and cost-effective to implement while greatly reducing hazardous wastewater discharges.

The resources below are provided to assist facilities in evaluating alternatives to help reduce the generation and discharge of hazardous wastewaters. Each resource below is followed by a description of how it can be used to assist in the decision-making process:

➤ [Environmental Protection Agency’s \(EPA’s\) LEAN and Water Toolkit](#)

This set of guidance materials was developed by EPA for facilities looking to improve operational performance while reducing environmental impacts associated with water usage. The toolkit provides a framework for identifying and addressing inefficient and unnecessary usage of water at manufacturing facilities.

➤ [EPA’s Toxic Release Inventory \(TRI\) Pollution Prevention Search Tool](#)

EPA has developed a searchable database that incorporates the TRI dataset to help facilities find pollution prevention measures implemented by similar sites. The search tool can be filtered by year, state, chemical, and industry sector to display P2 activities that have been used to reduce toxic releases, including certain hazardous wastewater discharges.

➤ [New York State Pollution Prevention Institute’s \(NYSP2I’s\) Resources Library](#)

NYSP2I’s resource library offers a compilation of case studies, reports, and presentations featuring P2 information applicable to a wide range of industries. The library includes numerous examples of work that NYSP2I has done with companies to find significant wastewater reductions (see [Mixed Acid Etching](#) paper and [Personal Care Products](#) case study). P2I’s library also includes a fact sheet on [Vacuum Cycle Nucleation](#), which is a new waste reduction technology that can help sectors that conduct precision parts cleaning to reduce their hazardous waste generation. For more information, interested facility operators can contact NYSP2I (see link under “Contact Information”).

***Note:** The resources provided above are meant to serve as helpful tools in finding easy-to-implement alternatives. However, not all of the alternatives contained in these resources are guaranteed to achieve compliance with regulations. For example, a facility that generates a listed hazardous waste may need to submit a petition to delist even when replacing hazardous chemicals with non-hazardous substitutes. In other cases, such as when converting from hexavalent to trivalent chrome plating, the sludges generated by treating this electroplating wastewater may still be a “listed” hazardous waste due to the nature of the electroplating process. Also, a facility may be able to reduce the toxicity of their waste, but not enough for the waste to be below the toxicity characteristic threshold. For these reasons, facility operators are responsible for carefully evaluating the available information with respect to regulatory requirements.

Further Assistance

New York State Pollution Prevention Institute (NYSP2I)

NYSP2I offers direct assistance to New York State businesses that need help finding economical pollution prevention measures that work for their facility. NYSP2I is based at the Rochester Institute of Technology and has a team of experts that can work with facilities to minimize their wastewater discharges and save money. To find out more, visit their website at the link provided below. Please consider contacting them for confidential pollution prevention assistance.

<http://www.rit.edu/affiliate/nysp2i/>

For additional information on any of the above resources or alternatives, please contact NYSDEC’s P2 Unit using the contact information below.

CONTACT INFORMATION

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