



# TREATMENT BY GENERATOR

Treatment Specific Guidance

## Evaporation

Fact Sheet 96-414

Revised August 2015

This document is for generators interested in treating their waste by on-site evaporation, in accumulation tanks or containers. Dangerous waste generators who comply with these standards and the standards in the Technical Information Memorandum (TIM) #96-412, [Treatment by Generator](#), will also meet the requirements of the [Dangerous Waste Regulations](#), Chapter 173-303 WAC<sup>1</sup>.

Ecology can require a permit or different management requirements if it determines the treatment process poses a threat to public health or the environment. If the treatment is part of a wastewater treatment operation (regulated under permit by rule), or the waste is being treated to meet Land Disposal Restriction (LDR) standards, please see “Other Regulatory Requirements,” on page 2. Small Quantity Generators should refer to Ecology’s focus sheet #14-04-004 [Small Quantity Generators Treating Dangerous Waste](#) for information applicable to their operations.

This document is intended only as guidance for the treatment requirements of the *Dangerous Waste Regulations*. The generator is still ultimately responsible for complying with all applicable federal, state, and local requirements relating to on-site waste management.

### Description and Definitions

Evaporation is the vaporization of water from non-volatile liquids, slurries, and sludges. Evaporators effectively remove water from certain waste streams, reducing the weight and volume of the waste. The remaining residue will need to be designated to determine if it is a dangerous waste.

There are three types of evaporators:

1. Natural evaporators: evaporation is caused by natural phenomena, such as solar energy or diffusion.
2. Direct contact evaporators: evaporation is caused when the heating source is in contact with the liquid.
3. Indirect evaporators: evaporation occurs when heat is applied through physical barriers to the liquid.

### Applicability

Evaporation may be appropriate for dewatering and reducing the volume of certain inorganic wastes, such as aqueous (water-based) solutions with heavy metals. Wastes containing organic constituents, such as methylene chloride or other solvents, are not appropriate for use in an evaporation system.

The difference between organic and inorganic wastes is in their chemical make-up—organic substances have carbon compounds and inorganic substances don’t. Solvents, oils, petroleum products, and some

---

<sup>1</sup> Washington Administrative Code

types of paint are common examples of organic substances. If you are unsure what organic or inorganic chemicals are in your waste stream, have it tested and designated. [Visit our website for resources on designation.](#)

## Criteria

The following criteria apply to treatment by generator evaporation in addition to the general Treatment by Generator requirements in TIM #96-412. Evaporators designed to remove water from non-volatile wastes are an allowable technology, if they meet the following conditions:

1. Only aqueous inorganic wastes can be treated in an evaporator. Inorganic wastes include spent caustics, rinse waters, metal sludge, and water-based machining coolants.
2. Don't treat organic solutions such as solvents, paints, or oils in an evaporator. Treatment must not produce uncontrolled toxic mists, fumes, dusts, or gases.
3. Don't evaporate to dryness, or "overcook." Evaporating to dryness can cause the release of toxic pollutants, such as metals, to the environment.
4. Designate and dispose of remaining sludge properly. The concentrated sludge commonly designates as dangerous waste.
5. Use secondary containment around the evaporator to capture spills.

## Recommendation

You may want to condense your evaporator steam for reuse in your process.

## Other Regulatory Requirements

Detailed information about the requirements of this guidance is in TIM #96-412, with information on appropriate permit by rule and LDR requirements. Generators must comply with the *Dangerous Waste Regulations*, Chapter 173-303 WAC, including proper designation of waste(s), accumulation standards, handling and labeling standards, reporting standards, spill and discharge requirements, etc. In addition, the generator must comply with all other applicable federal, state, and local regulations.

## Case Example

Plating shops generate large amounts of wastewater that designate as dangerous for lead. These shops can use an evaporator to reduce the quantity of waste needing disposal in an environmentally safe manner.

## Ecology Assistance

For more resources visit [www.ecy.wa.gov/programs/hwtr/manage\\_waste/treatment\\_by\\_generator.html](http://www.ecy.wa.gov/programs/hwtr/manage_waste/treatment_by_generator.html).

For assistance, please contact a hazardous waste specialist at one of these Ecology offices:

Northwest Regional Office, 425-649-7000

Central Regional Office, 509-575-2490

Southwest Regional Office, 360-407-6300

Eastern Regional Office, 509-329-3400

To request materials in a format for the visually impaired, call the Hazardous Waste and Toxics Reduction Program, 360-407-6700, Relay Service 711, or TTY 877-833-6341.