



GUIDELINES FOR SINK DISPOSAL OF CHEMICAL SUBSTANCES

1.0 Policy

Research, teaching, and other operations at Duke University generate chemical waste requiring disposal. Some chemicals can be recycled or reused, while other chemicals are classified as hazardous waste and specific rules must be followed to assure compliance with federal, state, and local regulations. Some chemical substances can be safely disposed of through sink and other drains to the local sewer system, while others are strictly prohibited.

This policy establishes requirements and limitations regarding the disposal of chemicals through campus laboratory sinks or other systems or devices that drain into the local sewer system without treatment. Disposal limitations and allowances are based on federal clean water regulations, the Durham City Sewer Use Ordinance, and similar local ordinances or rules.

2.0 Scope

This practice applies to all staff, faculty, and students at Duke University, the Duke University Medical Center, and the Duke University Health Systems who generate, use, or need to dispose of waste chemicals.

Any questions concerning the scope or extent of these guidelines should be addressed to OESO Environmental Programs at 684-2794.

3.0 Substances Prohibited from Drain Disposal

Certain classes of chemicals cannot be poured down the drain – they must be collected and disposed of as hazardous wastes. The following paragraphs contain a description of classes of substances that are prohibited or restricted from being poured down a drain into a local sewer system. Drain disposal is prohibited even if these substances are diluted plus it is illegal to dilute a substance to avoid complying with these rules.

3.1. Classes of Chemicals Prohibited from Drain Disposal

- *Any liquids, solids, or gases that pose a fire hazard alone or interact with other chemicals in the sewer and become a fire or explosion hazard.*
- *Solutions outside the pH range of 5.0 to 12.0.*
- *Halogenated hydrocarbons and aqueous mixtures containing halogenated hydrocarbons.*



- *Insoluble materials*
- *Mercury or mercury compounds* at concentrations greater than 0.0003 mg/l.
- *Water reactive materials*, including, but not limited to, aluminum alkyls, barium, lithium, potassium, sodium, sodium borohydride, zinc powder or zinc dust.
- *Photographic developer* containing hydroquinone or heavy metals such as barium or selenium or with a pH < 5.0 or > 12.0.
- *Used photographic fixer* solutions unless they are first passed through a silver recovery system
- *Rinsate from highly hazardous P-listed wastes* or any other chemical that would be classified as a hazardous waste.
- *Ethidium Bromide buffer solutions* at concentrations greater than 10 ug/ml.
- *Acrylamide solutions*

3.2 Local Discharge Standards

Substances that are prohibited by the local wastewater treatment works are listed in Section 23-92 of the Durham City Sewer Use Ordinance or similar ordinances in other municipalities and include:

1. Any pollutant or wastewater which causes interference or pass through.
2. Pollutants which create a fire or explosive hazard including, but not limited to, waste streams with a closed cup flashpoint of less than 140 F (60 C).
3. Solid or viscous substances in amounts which will cause obstruction of the flow of the POTW resulting in interference.
4. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through.
5. Any wastewater having a pH less than 5.0 or greater than 12.0 or wastewater having any corrosive property capable of causing damage to the POTW or equipment.
6. Any wastewater containing pollutants, including oxygen-demanding pollutants (BOD, etc.) in sufficient quantity, flow, or concentration either



- singly or by interaction with other pollutants to cause interference with the POTW.
7. Heat in amounts which will inhibit biological activity in the POTW treatment plant resulting in interference, but in no case wastewater which causes the temperature at the influent to the treatment plant to exceed 104 F (40 C).
 8. Any pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW.
 9. Any noxious or malodorous liquids, gases, or solids or other wastewater which, either singly or by interaction with other wastes, temporarily create a public nuisance or hazard to life or are sufficient to prevent entry into the sewers for maintenance or repair.
 10. Any substance which may cause the POTW's effluent or any other product of the POTW such as residues, sludges, or scums, to be unsuitable for reclamation or reuse or to interfere with the reclamation process.
 11. Any wastewater which imparts color which cannot be removed by the treatment process, including, but not limited to, dye wastes and vegetable tanning solutions.
 12. Any wastewater containing any radioactive wastes or isotopes except as specifically approved by the University Radiation Safety Officer and the POTW Director in compliance with applicable State and Federal regulations.
 13. Stormwater, rain water, street drainage, roof top drainage, basement drainage, subsurface drainage or yard drainage, unless specifically authorized by the Director.
 14. Any material containing ammonia, ammonium salts, or chelating agents which will produce metallic complexes that interfere with the municipal wastewater system.
 15. Any hazardous waste except as specifically authorized by the Director.
 16. Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail a toxicity test.
 17. Any wastes that might cause excessive foaming.
 18. Wastes which cause two successive readings on an explosion hazard meter at the point of discharge into the system or at any point in the system to be



more than 5%, or which cause any single reading to be over 10% of the lower explosive limit (LEL) of the meter.

3.3 Priority Pollutants – Chemicals listed by US EPA as priority pollutants in the Clean Water Act must be collected and managed as hazardous wastes. Table 1 attached to this practice contains the most current list of priority pollutants.

3.4 Wastewater Pretreatment Pollutants – Certain substances in concentrations above those listed below cannot be discharged through laboratory or other sinks without a permit to do so, including:

<i>Substance</i>	<i>Amount (mg/l)</i>
BOD	250
TSS	250
Arsenic	0.003
Cadmium	0.003
Copper	0.061
Cyanide	0.005
Lead	0.049
Mercury	0.0003
Nickel	0.021
Silver	0.005
Total chromium	0.050
Zinc	0.175
Ammonia	25.0



4.0 Acceptable Substances for Drain Disposal

Chemicals that can be disposed of down the drain, providing the solution does not contain materials otherwise prohibited include:

1. Aqueous solutions such as salts or buffer solutions within the pH range of 5.0 to 12.0.
2. Aqueous solutions with a flashpoint greater than 140F (60 C).
3. Chemicals that are water soluble and not hazardous by definition.
4. Biological liquids that have been treated with disinfectant or autoclaved.
5. Buffer solutions containing less than 10 ug/ml of ethidium bromide.
6. Aqueous solutions containing alcohols at a concentration of 24% by weight or less.
7. Aqueous solutions containing formalin at concentrations of 10% by weight or less.
8. Small quantities of acids or bases that have been neutralized in the laboratory.

5.0 Responsibilities

5.1 Occupational Environmental Safety Office (OESO) will

- a. Provide technical support, information, consultation, and training;
- b. Support regulatory compliance;
- c. Monitor compliance to this practice; and
- d. Investigate accidents that result in the release of chemicals into the sanitary sewer.

5.2 Principal Investigators, Laboratory Directors and Other Responsible Managers will have primary responsibility for ensuring that the guidelines herein are followed in their laboratories and other locations where waste chemicals or other hazardous wastes may be generated.

5.3 Faculty, staff and students will comply with these guidelines to ensure that chemical or other hazardous wastes generated from their activities are disposed of properly and not poured down sink drains or other drains to the sanitary sewer unless they are listed in Section 4.0 of these Guidelines or approved by OESO.



6.0 References

1. 40 CFR 403.5 National Pretreatment Standards: Prohibited Discharges
2. Article IV City of Durham Sewer Use Ordinance
3. Article C. Use of the Sanitary Sewer System, City of Raleigh Municipal Code

7.0 Definitions

1. POTW means the Publically Owned Treatment Works or the local wastewater treatment plant.
2. Hazardous waste means a waste that is either listed as a hazardous waste or has characteristics that would make a hazardous waste and is regulated under the Resource Conservation and Recovery Act (RCRA).
3. P-Listed Wastes are hazardous wastes that are considered to be extremely hazardous and subject to special disposal restrictions. A link to the P waste list can be found in the waste management section of the Compliance Assistance page of the Environmental Programs webpage at [www. Safety.duke.edu](http://www.Safety.duke.edu).
4. BOD means biochemical oxygen demand. The BOD is a measure of the degree of water pollution based on the amount of oxygen required by microorganisms to decompose organic matter in a sample of water.
5. TSS means total suspended solids and is a measure of the amount of suspended material in a water sample.