How to Dispose of Clinical Laboratory Equipment Effluent

Technical Information Paper No. 37-032-0415

1. WHAT IS THE ISSUE? Federal, state and local regulations will require generators of laboratory equipment effluents to collect and dispose of them based on their physical or chemical properties that are inherent to the effluent.

2. WHAT ONE MUST DO? Hospital clinical laboratory equipment generates liquid effluent waste, which may be hazardous waste due to ignitability, corrosivity, toxicity, reactivity, or generated from a process specifically listed as a hazardous waste. You may dispose of many such waste effluents down the drain to the wastewater treatment plant as long as you:

- Understand what is in the waste
- Comply with standards applicable to the waste effluent discharged to the wastewater treatment plant
- Coordinate with the garrison public works and environmental office
- Maintain required records including effluent sampling results

The Domestic Sewage Exclusion (DSE) (Title 40 Code of Federal Regulation (CFR) Part 261.4) and Clean Water Act (Title 40 CFR Part 403) set the conditions for and restrictions applicable to this down-the-drain disposal. You may not dispose of some waste effluents or chemicals down the drain due to safety hazards or regulatory prohibitions. Equipment effluents restricted from down-the-drain disposal may be a hazardous waste and require management as such.

3. WHAT IS IN YOUR EFFLUENT WASTE? You can determine this by reviewing Safety Data Sheets (SDS) (i.e., user knowledge) and/or testing the effluent using U.S. Environmental Protection Agency-approved procedures specific for the characteristic or analyte in question. The Army Institute of Public Health (AIPH) Waste Management Program (WMP) conducted effluent sampling at most of the clinical laboratory equipment in healthcare facilities (HCF) and identified those effluents (or equipment that generate them) that typically are hazardous waste. Contact the WMP (see paragraph 11) below or see https://iphc.amedd.army.mil/organization/EHE/Lists/LED/LED.aspx (contact WMP for access) [Note: The manufacturer reagent SDSs may not adequately describe effluent wastes due to the ratios of reagents used for a particular test.]

4. WHAT STANDARDS APPLY TO EFFLUENTS DISCHARGED TO THE SEWER? Army HCFs discharge to either Publically Owned Treatment Works

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(POTW) owned and operated by municipalities or private companies or to Federally Owned Treatment Works (FOTW) owned by the U.S. Government and operated either by the government or by contractors under privatization agreements. Under certain circumstances, it is permissible to discharge effluents that meet the criteria for classification as hazardous waste to the sewer. Under the Resource Conservation and Recovery Act (RCRA), there is an important distinction between discharges to Federally Owned Treatment Plants and Publically Owned Treatment Plants. Effluents from an HCF to a POTW can generally qualify for the Domestic Sewage Exclusion (Title 40 CFR Part 261.4) provided the effluents meet necessary pretreatment standard for the constituent or characteristic of concern. A similar exclusion for discharges of HW to FOTWs exists in the Section 102 of the Federal Facility Compliance Act (FFCA). Under this exclusion, it is permissible to discharge effluents provided they are subject to and met the pretreatment standard, OR if they meet the RCRA Land Disposal Restriction level (LDR) (Title 40 CFR Part 268.40). Effluents that meet the criteria for these exclusions are by definition not a regulatory solid or hazardous waste under Subtitle C of RCRA. Coordinate with your garrison public works and environmental offices to find out what your wastewater treatment plant is and what standards apply to your waste effluent.

5. WHAT EFFECT DOES A NEUTRALIZATION TANK HAVE ON WHAT ONE CAN DISCHARGE? A properly functioning neutralization tank will effectively mitigate pH spikes and bring the pH of the effluent back into the permissible pH range as specified within wastewater discharge permit, Clean Water Act (CWA), or other governing requirements. If not known already, contact HCF Facilities/Maintenance to determine whether there is a functioning neutralization tank within the HCF. It will also be necessary to determine who is maintaining, monitoring, and/or sampling the effluent in an effort to verify the tank is properly working.

6. WHAT IS THE SIGNIFICANCE OF THE POINT OF COMPLIANCE? The point of compliance (POC) for collecting representative samples of the waste streams is contingent upon the regulatory driver in question. Under the CWA, the permit typically specifies the location where the effluent from the building and the sanitary sewer line meet. Monitoring at this location typically involves flow or time-weighted composite sampling methods and confined space entry. Depending on the size of the facility, there may be multiple locations, resulting in multiple compliance points, all of which will require monitoring.

For RCRA purposes, sampling will occur at the point of generation to determine whether the effluent is a hazardous waste. If the effluent were a hazardous waste, additional sampling would occur at the CWA point of compliance to determine whether applicable LDR standard or pretreatment standards are met thus excluding the effluent from management under RCRA. Absent a pretreatment permit for the installation, the location described in the paragraph above (i.e., point where the effluent from the

building and the sanitary sewer line meet) will serve as the POC for monitoring purposes.

7. WHAT RECORDS DOES ONE RETAIN?

- Waste effluent characterizations or profiles, including those not hazardous and not regulated.
- POTW or FOTW standards and conditions applicable to your waste effluents.
- Sampling records demonstrating compliance with POTW or FOTW standards.
- If your HCF has a neutralization tank used to regulate the pH of effluents discharged from a facility due to fluctuations that occur in the pH due to laboratory effluents, cleaning solutions, and disinfection systems:
  - Sampling records of tank discharge to demonstrate neutralization are effective.
  - Records of tank maintenance including media change and clean-out.
- Coordination with garrison public works, the environmental offices and with the Environmental Science and Engineering Officer.

8. WHERE TO SAMPLE?

- Sample effluent from the lab equipment discharge port or the waste collection container before the effluent goes down the drain. Resample the effluent if an equipment upgrade occurs or if there is a change in the types and quantities of reagents used.
- Sample regularly for neutralization-tank performance at the tank discharge inside the HCF.
- The frequency of sampling will occur per the garrison environmental office requirements for compliance with POTW or FOTW pretreatment standards at the “POC” at the location the HCF sewer lines connect to the installation system. Usually, this means the nearest manhole outside the HCF. Monitoring at this location typically involves flow or time-weighted composite sampling methods and confined space entry. Depending on the size of the facility, there may be multiple points of compliance that require sampling. [Note: Notify the environmental office if sampling indicates a violation of any discharge condition and work to correct the problem. The garrison environmental office may already be conducting sampling on a routine basis based on permit requirements.]
- Conduct sampling at a frequency necessary to demonstrate compliance with pretreatment standards/LDRs.

- Sampling schemes will be rigorous to capture fluctuations that may occur in the effluent characteristics/properties due to work practices, flow patterns, and volumes of effluents discharged.

9. WHEN CAN ONE DISCHARGE AN EFFLUENT DOWN THE DRAIN? Before discharging an effluent down the drain, one will characterize the effluent using one of two methods: 1) by reviewing the SDS of all reagents used for conducting tests; 2) by collecting a representative sample of the effluent. Based on information gleaned during the process, there are four possible scenarios:

- Scenario 1: The laboratory effluent does not exhibit any characteristics of hazardous waste and does not exceed any of the thresholds per the pretreatment standards. Discharge of this effluent to the sanitary sewer is permissible without exception.
- Scenario 2: The laboratory effluent does not exhibit any characteristics of hazardous waste but does exceed one or more pretreatment standards. Collect and dispose of this effluent as non-RCRA waste UNLESS DPW approved disposal to the sanitary sewer AND either the neutralization tank will mitigate the exceedance AND/OR the concentration/property will not result in noncompliance at the POC.
- Scenario 3: The laboratory effluent exhibits a characteristic of hazardous waste and does not meet applicable pretreatment standards. Collect and manage You these effluents as hazardous waste UNLESS DPW approved disposal to the sanitary sewer AND either the neutralization tank will mitigate the exceedance AND/OR the concentration/property will not result in noncompliance at the POC.
- Scenario 4: The laboratory effluent exhibits one or more characteristics of hazardous waste but meet all applicable pretreatment standards. These effluents may qualify for the DSE either in RCRA or the FFCA and may be eligible for discharge to the sewer in certain circumstances. Collect and manage these effluents as hazardous waste UNLESS DPW approved disposal to the sanitary sewer AND either the neutralization tank will mitigate the exceedance AND/OR the concentration/property will not result in noncompliance at the POC.

10. WHAT WASTES SHOULD NOT GO DOWN THE DRAIN? In the absence of any characterization testing, review of SDS, nor approval from DPW, do not discharge the following laboratory effluents to the sanitary sewer:

- Laboratory effluents with sodium azide concentrations of greater than 1.0 percent.

- Laboratory effluents that are corrosive (i.e., pH less than 6 or greater than 9).
- Laboratory effluents that exhibit flashpoints of <140° F and do not satisfy the requirements of the alcohol-content exclusion (Title 40 CFR Part 261.24(a)(1)).
- Raw/Bulk/Pure Chemicals.
- Laboratory effluents with excessive coloration (i.e., concentration solutions of stains).
- Cyanide waste.
- Laboratory effluents containing radiological Waste (consult Radiation Safety Officer).
- Do not intentionally dilute waste effluents either by mixing directly with another liquid or by flushing the system with tap water. Incidental dilution via the mixing of effluent with the contents of the sewer system as it moves through the system is permissible. Two exceptions to this are—
  - Flushing the drain when discharging solutions containing less than 1 percent sodium azide **is permissible**.
  - Performing elementary neutralization of a corrosive solution according to Title 40 CFR Part 260.10, 261.22, and 270.1(c)(2)(v) **is permissible**.

11. WHERE TO GET HELP? HCFs may contact the AIPH WMP at 1-800-276-3651 or DSN 584-3651 for assistance in sampling, review of data/SDS, and/or interpretation of regulations.

12. REFERENCES.

- Title 40 CFR Part 261, Identification of Listing of Hazardous Wastes
- Title 40 CFR Part 268, Land Disposal Restrictions
- Title 40 CFR Part 403, General pretreatment Regulations for Existing and New Sources of Pollution
- Title 40 CFR Part 460, Hospital Point Source Category
- Federal Facilities Compliance Act
- Food and Drug Administration (http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/TipsandArticlesonDeviceSafety/ucm186147.htm)

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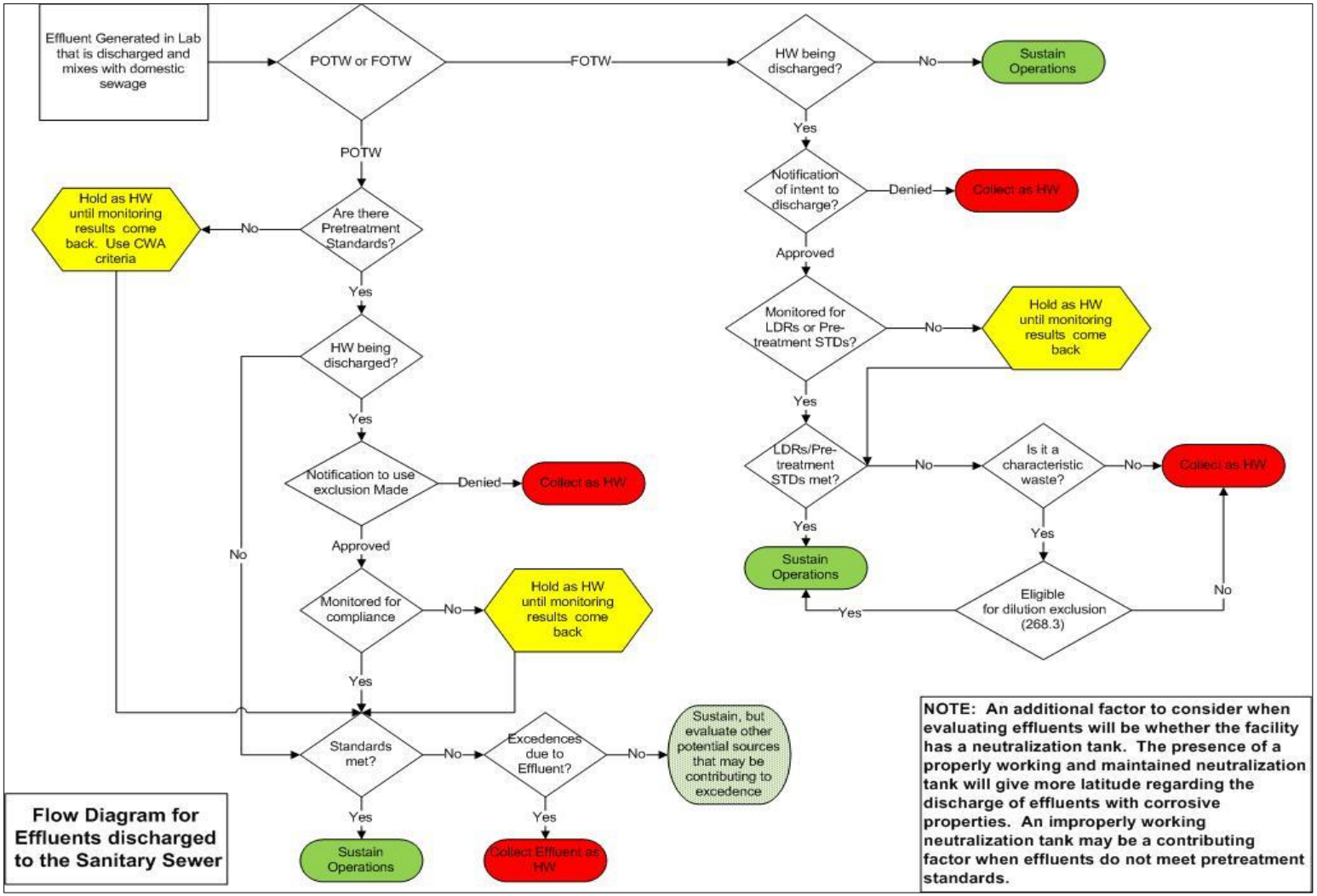

Flow Diagram for Effluents Discharged to the Sanitary Sewer