HAZARDOUS MATERIALS AND WASTE MANAGEMENT PLAN

UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES

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RECORD OF REVISIONS

Rev No.	Approval Date	
1	Oct 2011	Initial Issue
2	Jan 2012	Annual Review
3	Jan 2014	Annual Review
4	Oct 2014	Annual Review
5	Jul 2019	Annual Review
6	Sep 2022	Annual Review
7	August 2024	Annual Review • complete rewrite/reformat of document • included updates to document so it can also serve as the Laboratory Management Plan (changes made in response to 2023 Arkansas DEQ audit) • added content for Universal Waste • added information related to different types of wastes • added information related to discharging fluid from Emergency Department Decontamination tanks

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1.0 EXECUTIVE SUMMARY

This plan presents the policies, procedures, responsibilities, and program objectives that will be used by University of Arkansas for Medical Science (UAMS) personnel to ensure compliance with applicable waste handling rules, regulations, plans and procedures required by local authority, the Arkansas Department of Energy and Environment (ADEE), and the Environmental Protection Agency (EPA).

2.0 PURPOSE

This Hazardous Materials and Waste Management Plan (HMWMP) describes activities, functions, and requirements necessary to ensure safe, environmentally compliant handling of waste generated at UAMS. Additionally, the HMWMP incorporates the general principles of waste minimization, waste segregation and implements specific requirements of the Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation 23, “Hazardous Waste Management”.

The United States Environmental Protection Agency (US EPA) has implemented strict rules and regulations pertaining to the handling and disposal of hazardous wastes. The Resource Conservation and Recovery Act (RCRA) established the cradle-to-grave concept. This concept involves the tracking of hazardous waste from the point of generation through its final disposition. If UAMS is found to be in violation of RCRA laws, UAMS can be fined. Additionally, criminal charges may be brought against individuals who knowingly violate state, federal, or local regulations. Failure to follow guidelines established within this plan could result in disciplinary action not to exclude termination of employment.

The HMWMP will serve as the “Laboratory Management Plan” as required by APC&EC Reg. 23 §262.214 Subpart K. Appendix F- Subpart K Laboratory Management Plan Requirements per AR APC-EC §262.214 identifies specific sections within this plan that address the elements of a Laboratory Management Plan. This plan shall be made available to laboratory workers, students, or any other personnel at UAMS that request it.

3.0 SCOPE

The HMWMP includes procedures for waste handling and compliance for all UAMS personnel. Since laboratory work frequently produces an unpredictable variety of wastes, much of the information provided within this plan specifically addresses laboratory waste disposal. Specific procedures for continuous operations (longer than one month) generating hazardous waste are to be developed by the overseeing laboratory manager, Principal Investigator (PI) or facility manager and approved by the UAMS Occupation Health & Safety Department (OH&S) to ensure that these procedures comply with this plan.

4.0 REVISIONS

At a minimum, this HMWMP will be reviewed annually.

Additional revisions will be made as needed. Some examples when additional revisions may be needed include but are not limited to:

1) Incorporating changes to the UAMS Hazardous Waste Permits
2) New regulations are promulgated or regulatory guidance is issued
3) New site-specific Safety or Environmental requirements are implemented

5.0 DEFINITIONS

Definitions pertaining to Hazardous Waste Management processes under the authority of the ADEE may be found in Regulation 23 § 260.10. The definitions specific to this document are listed below.

1) **ABANDONED MATERIALS**: Per APC&EC Reg. 23 §261.2, materials that are:

- disposed or
- burned or
- incinerated or
- accumulated, stored, or treated (but not recycled)

2) **ACUTE HAZARDOUS WASTE**: Waste materials that pose an immediate and sever threat to human health or the environment. P-listed wastes are designated as acute hazardous waste. Hazardous wastes that meet the listing criteria in APC&EC Reg. 23 § 261.11(a)(2) and therefore are either listed in §261.31with the assigned hazard code of (H) or are listed in § 261.33(e).

3) **CENTRAL ACCUMULATION AREA (CAA)**: any on-site hazardous waste accumulation area with hazardous waste accumulating in units subject to APC&EC Reg. 23 §262.17 for large quantity generators and §262.211 for eligible academic entities that choose to operate under section 262 subsection K.

4) **CHARACTERISTICS OF HAZARDOUS WASTES**: Hazardous waste characteristics are defined in APC&EC Reg. 23 Subsection C, "Characteristics of Hazardous Wastes." These characteristics are defined as:

- ignitability (APC&EC Reg. 23 §261.21)
- corrosivity (APC&EC Reg. 23 §261.22)
- reactivity (APC&EC Reg. 23 §261.23)
- toxicity (APC&EC Reg. 23 §261.24)

The tests for these characteristics are provided in their respective definitions within this section.

5) **CHEMICAL HYGIENE OFFICER (CHO):** The Chemical Hygiene Officer exercises oversight and audit responsibilities for the UAMS hazardous waste system. This person must be familiar with EPA and APC&EC Hazardous Waste Management regulations. The CHO must receive at a minimum ongoing training in hazardous waste management in accordance with (IAW) APC&EC Reg. 23 §264.16. The CHO is responsible for developing and maintaining the laboratory waste management system. The CHO trains the UAMS personnel about the requirements of the HMWMP and is responsible for collection and storage functions of the HMWMP.

6) **COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA)**: Enacted in 1980, this law makes those persons responsible for the release of a hazardous substance liable for the cost of cleanup ("Superfund" was created under this law). The Superfund Amendments and Reauthorization Act was used to reauthorize CERCLA in 1986.

7) **CORROSIVITY**: The hazardous waste characteristic for corrosivity is defined in APC&EC Reg. 23 §261.22, "Characteristic of Corrosivity." Generally, hazardous wastes with this characteristic have:

- a pH less than or equal to 2 or greater than or equal to 12.5 as determined by a pH meter using Method 9040 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication Solid Waste - 846 (SW-846).
- if it corrodes steel (Society of Automotive Engineers [SAE 1020]) at a rate greater than 6.35 millimeter (mm) (0.25 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in National Association of Corrosion Engineers (NACE) Standard Test Method TM-01-69 as standardized in SW-846.

A solid waste that exhibits the hazardous waste characteristic for corrosivity has the EPA Hazardous Waste Number D002.

8) **DISCARDED MATERIAL**: Any material which is abandoned or considered "inherently waste-like"

9) **D001**: D001 refers to the EPA Hazardous Waste code for the characteristic of ignitability. See the definition for ignitability.

10) **D002**: D002 refers to the EPA Hazardous Waste code for the characteristic of corrosivity. See the definition for corrosivity.

11) **D003**: D003 refers to the EPA Hazardous Waste code for the characteristic of reactivity. See the definition for reactivity.

12) **D004-D0043**: D004, D005, D006, etc., refers to the EPA Hazardous Waste code for the characteristic of toxicity of specific metals and organics defined in APC&EC Reg. 23 §261.24. See the definition for toxicity.

13) **ENGINEERING & OPERATIONS (E&O)**: The Engineering & Operations Department is part of the family of the Campus Operations Division of UAMS. They provide services on UAMS campus in the following areas: architectural, mechanical, electrical, and plumbing.

14) **EPISODIC EVENT**: an activity or activities, either planned or unplanned, that does not normally occur during generator operations, resulting in an increase in the generation of hazardous wastes that exceeds the calendar month quantity limits for the generator's usual category.

15) **F-LISTED WASTE**: process wastes from non-specific sources and are assigned waste codes that begin with the letter "F". List can be found in APC&EC Reg. 23 §261.31.

16) **HAZARDOUS WASTE**: Under APC&EC Reg. 23 §261.3, "a solid waste as defined in §261.2 is a hazardous waste if: it is not excluded from regulation as a hazardous waste under §261.4(b) and it meets any of the following criteria:

- If it exhibits any of the characteristics identified in Subsection C (i.e. ignitability, corrosivity, reactivity, toxicity)
- If it is listed on one of the three lists in §261 Subpart D (i.e. the F, K, P, U lists)
- If it is mixed with listed waste (the "mixture rule")

17) **IGNITABILITY**: The hazardous waste characteristic for ignitability is defined in APC&EC Reg. 23 §261.21, "Characteristic of Ignitability." Generally, hazardous wastes with this characteristic have

- a flashpoint of less than 60°C (140°F)
- solid waste that exhibits this hazardous waste characteristic has the EPA Hazardous Waste Number D001.

18) **K-LISTED WASTE**: process wastes from specific sources and are assigned waste codes that begin with the letter "K". List can be found in APC&EC Reg. 23 §261.32.

19) **LABORATORY**: an area owned by an eligible academic entity where relatively small quantities of chemicals and other substances are used on a non-production basis for teaching or research (or diagnostic purposes at a teaching hospital) and are stored and used in containers that are easily manipulated by one person. *(APC&EC Reg. 23 §262.200)*

20) **LABORATORY CLEAN-OUT**: an evaluation of the inventory of chemicals and other materials in a laboratory that are no longer needed or that have expired and the subsequent removal of those chemicals or other unwanted materials from the laboratory. *(APC&EC Reg. 23 §262.200)*

21) **LABORATORY WORKER**: a person who handles chemicals and/or unwanted material in a laboratory and may include, but is not limited to, faculty, staff, post-doctoral fellows, interns, researchers, technicians, supervisors/manager, and principal investigators. A person does not need to be paid or otherwise compensated for his/her work in the laboratory to be considered a laboratory worker. Undergraduate and graduate students in a supervised classroom setting are not laboratory workers. *(APC&EC Reg. 23 §262.200)*

22) **LARGE QUANTITY GENERATOR (LQG)**: a generator that generates any of the following amounts in a calendar month:

- Greater than or equal to 1,000 kilograms (2200 lbs) of non-acute hazardous waste or
- Greater than 1 kilogram (2.2 lbs) of acute hazardous waste listed in §261.31 or §261.33 or
- Greater than 100 kilograms (220 lbs) of any residue or contaminated soil, water, or other debris resulting from the cleanup of a spill, into or on any land or water, or any acute hazardous waste listed in §261.31 or §261.33

23) **LISTS OF HAZARDOUS WASTES**: APC&E Reg. 23 Subsection D, "Lists of Hazardous Wastes' defines a solid waste [a solid waste may be in a gaseous, liquid or solid state as defined by APC&EC Reg. 23 §261.23] as a hazardous waste if listed in Subsection D, unless excluded under APC&EC Reg. 23 §§ 260.20 and 260.22.

24) **P-LISTED WASTE**: unused commercial chemical products that are hazardous wastes when discarded and are considered to be acute hazardous wastes (i.e., they could be, or are, fatal to humans or animals in low doses) sources and are assigned waste codes that begin with the letter "P". List can be found in APC&EC Reg. 23 §261.33.

25) **REACTIVITY**: The hazardous waste characteristic for reactivity is defined in APC&EC Reg. 23 §261.23, "Characteristic of Reactivity." Generally, hazardous wastes with this characteristic have properties that include:

- Readily undergoes violent change without detonating,
- Reacts violently with water,
- Forms explosive mixtures with water
- Generates toxic gases when mixed with water,
- Generates cyanide or sulfide-bearing wastes in pH conditions between 2 and 12.5,
- Is capable of detonation or explosion if it is subjected to a strong initiating source,
- Is capable of detonation or explosion at standard temperature and pressure,
- Is forbidden explosive defined in 49 Code of Federal Regulations (CFR) 173.51, 49 CFR 173.53, or 49 CFR 173.88.

A solid waste that exhibits this hazardous waste characteristic has the EPA Hazardous Waste Number D003.

26) **RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)**: The first (1976) national law (amended in 1980 and 1984) to address hazardous waste disposal issues; authorizes EPA to regulate hazardous waste; requires a "cradle-to-grave" tracking system for wastes, and initially directed at industrial generators, including laboratories.

27) **SATELLITE ACCUMULATION AREA** (SAA): a location that is at or near the point of generation where hazardous wastes initially accumulate and is under the control of the operator of the process generating the waste. Up to 55 gallons of hazardous waste may be collected in the SAA IAW APC&EC Reg. 23 §262.34(c)(1).

28) **SOLID WASTE**: any material that is discarded by being abandoned, inherently waste-like, recycled, or a military munition identified as a solid waste. Inherently waste-like materials are materials that, regardless of whether it is abandoned or recycled, may still pose danger to human health or the environment after recycling.

29) **SW-846**: This acronym refers to "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. This publication is incorporated by reference in APC&EC Reg. 23 §260.11.

30) **TOXICITY**: The hazardous waste characteristic for toxicity is defined in APC&EC Reg. 23 §261.24, "Toxicity Characteristic" Generally, hazardous wastes with this characteristic contain concentrations of one or more of the contaminants listed in Table 1 of APC&EC Reg. 23 §261.24 above the regulatory levels listed. A solid waste that exhibits this hazardous waste characteristic has the EPA Hazardous Waste Number corresponding to contaminant listed in Table 1. Wastes with this characteristic are determined using the Toxicity Characteristic Leaching Procedure defined below.

31) **TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)**: Toxicity Characteristic Leaching Procedure is a test to determine the presence of certain specific contaminants listed in

APC&EC Reg. 23 §261.24, Table 1, "Maximum Concentration of Contaminants for the Toxicity Characteristic." This test is listed as test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.

32) **TRAINED PROFESSIONAL**: person(s) that has completed the applicable RCRA training requirements of APC&EC Reg. 23 §262.17 for large quantity generators. A trained professional may be an employee of the eligible academic entity or may be a contractor or vendor who meets the requisite training requirements. *(APC&EC Reg. 23 §262.200)*

33) **U-LISTED WASTE**: unused commercial chemical products that are hazardous wastes when discarded and are toxic and/or pose other hazards sources and are assigned waste codes that begin with the letter "U". These materials are obviously potentially harmful to human health and the environment, but they don't pose quite as immediate a threat as the acute hazardous wastes on the P-List. Carcinogens, mutagens, and materials that bioaccumulate in the environment are commonly found on the U-List of hazardous chemicals. List can be found in APC&EC Reg. 23 §261.33.

34) **UNIVERSAL WASTE**: any of the following hazardous wastes that are managed under the universal waste requirements of APC&EC Reg. 23 §273. These include the following:

- Batteries
- Pesticides
- Mercury-containing devices
- Lamps
- Consumer electronic items

35) **UNIVERSAL WASTE BATTERY**: Spent batteries such as nickel-cadmium (Ni-Cd, or Nicad) and small sealed lead-acid batteries (found in many common items such as electronic equipment, portable telephones, portable computers, and emergency lighting).

36) **UNIVERSAL WASTE CONSUMER ELECTRONIC ITEM**: an electronic item or other electronic waste containing an intact or broken cathode ray tube, (e.g., television, computer monitor, or other cathode ray tube monitor or display device), personal computer or computer component, audio and/or stereo player, videocassette recorder/player, digital videodisk (DVD) recorder/player, video camera, telephone, facsimile or copying machine, cellular telephone, wireless paging device, or video game console.

37) **UNIVERSAL WASTE PESTICIDE**: Agricultural pesticides that have been recalled or banned from use, are obsolete, have become damaged, or which are no longer needed due to changes in cropping patterns or other factors.

38) **UNIVERSAL WASTE LAMP**: the bulb or tube portion of an electric lighting device. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. Only intact spent lamps may be managed as universal waste.

39) **UNIVERSAL WASTE MERCURY CONTAINING DEVICES**: a device or a part of a device (including thermostats but excluding batteries and lamps) which contains elemental mercury integral to its function. These devices exhibit a characteristic of hazardous waste.

40) **UNWANTED MATERIAL**: any chemical, mixtures of chemicals, products of experiments or other material from a laboratory that is no longer needed, wanted or usable in the laboratory and that is destined for hazardous waste determination by a trained professional. Unwanted materials include reactive acutely hazardous unwanted materials and materials that may eventually be determined not to be solid waste pursuant to APC&EC Reg. 23 §261.2, or a hazardous waste pursuant to APC&EC Reg. 23 §261.3.

41) **USED OIL**: any oil that has been refined from crude oil, or any synthetic oil, and as a result of such use is contaminated by physical or chemical impurities.

42) **WASTE MINIMIZATION**: Any method used to reduce the volume and toxicity of hazardous waste, either by reducing the volume of hazardous material or by directly treating hazardous waste. See RCRA Permit for specific requirements.

43) **WORKING CONTAINER**: a small container (i.e., two gallons or less) that is in use at a laboratory bench, hood, or their workstation, to collect unwanted material from a laboratory experiment or procedure. *(APC&EC Reg. 23 §262.200)*

6.0 REFERENCES

29 CFR 1910, Occupational Safety and Health Standards (OSHA)

40 CFR, Protection of Environment

49 CFR, Transportation

Arkansas Pollution Control & Ecology Commission, Regulation 23, Hazardous Waste Management

Prudent Practices in the Laboratory, Handling and Disposal of Chemicals, Committee on Prudent Practices for Handling, Storage, and Disposal of Chemicals in Laboratories, National Academy Press, 1995

SW-846, Test Methods for Evaluating Solid Waste (current edition)

Title V (Air) Operating Permit 2125-AOP (Air Permit, current edition)

UAMS Abandoned Hazardous Chemicals/Biological Materials (Admin Guide 11.4.11)

UAMS All Hazards Emergency Operations Plan (EM 10)

UAMS Biosafety Manual

UAMS Chemical Hygiene Plan (Admin Guide 11.4.19)

UAMS Chemotherapy Drug Handling and Waste Disposal (Admin Guide 11.4.13)

UAMS Hazard Communication (Admin Guide 11.4.02)

UAMS Hazardous Materials Contingency Plan

UAMS Laboratory Safety Manual (Admin Policy 11.4.08)

UAMS Occupational Exposure to Hazardous Chemicals in Laboratories (Admin Guide 11.4.19)

UAMS Radiation Safety Manual

7.0 RESPONSIBILITIES

A successful HMWMP requires full cooperation and strict compliance at all times with Arkansas Pollution Control & Ecology Commission (APC&EC) Reg. 23, Hazardous Waste Management; §260 to §266, §268, and §270; and the terms and conditions in the Little Rock Water Reclamation Authority Industrial Wastewater Discharge permit for wastewater discharges, along with RCRA Permit and the current Title V (Air) Operating Permit 2125-AOP.

The following are the specific duties and responsibilities of the personnel at UAMS:

7.1 CAMPUS OPERATIONS SUPPORT SERVICES

7.1.1 Building/Facility Managers

7.1.1.1 Complete training requirements for handling any hazardous or universal waste identified during building rounding or walkthroughs.

7.1.2 Move Team

7.1.2.1 Complete training requirements for handling any hazardous or universal waste identified during move activities.

7.2 CLINICAL ENGINEERING

7.2.1 Ensure contractors properly containerize, label, store, and/or dispose of any hazardous or universal waste generated when performing demolition, construction, or equipment maintenance work.

7.2.2 Containerize, label, and store hazardous or Universal Waste IAW this plan.

7.2.3 Have a thorough knowledge of the procedures contained within this plan.

7.3 ENGINEERING & OPERATIONS (E&O)

7.3.1 Ensure that fire water systems are maintained to provide water at adequate volume and pressure to supply IAW APC&EC Reg. 23 §262.252:

7.3.1.1 water hose streams

7.3.1.2 foam producing equipment

7.3.1.3 automatic sprinklers

7.3.1.4 water spray systems

7.3.2 Test and/or maintain:

7.3.2.1 portable fire extinguishers

7.3.2.2 fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals)

7.3.2.3 facility communications equipment

7.3.2.4 alarm systems

7.3.2.5 spill control equipment

7.3.2.6 decontamination equipment

7.3.3 Ensure all E&O personnel involved in Universal waste operations are properly trained.

7.3.4 Ensure contractors properly containerize, label, store, and/or dispose of any hazardous or universal waste generated when performing demolition, construction, or equipment maintenance work.

7.3.5 Containerize, label, and store Universal Waste IAW this plan.

7.3.6 Have a thorough knowledge of the procedures contained within this plan.

7.4 E&O WAREHOUSE SUPERVISOR

7.4.1 Serve as point of contact (POC) for storing Universal Waste lamps and batteries.

7.4.2 Coordinate shipments of Universal Waste lamps and batteries within 6 months of accumulation start date.

7.4.3 Have a thorough knowledge of the procedures contained within this plan.

7.5 INFORMATION TECHNOLOGY (IT)

7.5.1 Test and/or maintain internal and external communications (e.g., phones, public address system, alarms, etc.) capable of providing immediate emergency instruction (voice or signal) to facility personnel IAW APC&EC Reg. 23 §262.252.

7.5.2 Serve as main POC for accumulation and disposal of consumer electronic devices.

7.5.3 Have a thorough knowledge of the procedures contained within this plan.

7.6 OH&S CHEMICAL HYGIENE OFFICER

7.6.1 Monitor compliance with state, local, federal, and installation hazardous waste regulations and the UAMS hazardous waste permit.

7.6.2 Provide escorts for regulatory personnel visiting the UAMS campus.

7.6.3 Review and revise the HMWMP, as necessary.

7.6.4 Manage the Central Accumulation Area (CAA).

7.6.5 Coordinate the disposal of UAMS generated hazardous wastes.

7.6.6 Review, sign, and maintain manifests for shipping hazardous waste to off-site permitted storage or off-site Treatment, Storage, or Disposal Facility as required by APC&EC Reg. 23 Subsection E of §264.

7.6.7 Ensure that wastes comply with the requirements of APC&EC Reg. 23 §268.7.

7.6.8 Provide advice and guidance concerning the regulatory considerations of any proposed waste.

7.6.9 Coordinate with the PI/Lab Manager (or delegate) to gain sufficient information in order to make a hazardous waste determination of the waste generated in each laboratory prior to removal of the unwanted material from the laboratory.

7.6.10 Ensure the words “Hazardous Waste” are noted on the container label before the hazardous waste is removed from the laboratory.

7.6.11 Ensure appropriate hazardous waste code(s) are noted on the container label before the hazardous waste is sent off-site for disposal.

7.6.12 Ensure any hazardous waste is counted towards UAMS’ generator category in the calendar month that the hazardous waste determination was made.

7.6.13 Ensure a trained professional accompanies all hazardous waste that is transferred from the laboratory(ies) to the on-site CAA.

7.6.14 Provide appropriate waste labels for all waste containers placed in service (non-regulated and hazardous).

7.6.15 Maintain waste profiles for UAMS waste streams.

7.6.16 Perform periodic checks of designated Universal Waste accumulation area(s).

7.6.17 Develop and maintain a Contingency Plan, a Quick Reference Guide, and Emergency Procedures IAW APC&EC Reg. 23§262 Subsection M – Preparedness, Prevention, and Emergency Procedures for Large Quantity Generators.

7.6.18 Coordinate with leadership to ensure staff have completed required training IAW APC&EC Reg. 23 §262.207.

7.6.19 Maintain required training documentation for any UAMS “trained professional” IAW APC&EC Reg 23 §262.17.

7.6.20 Assist with training of UAMS “trained professionals” and laboratory workers or students, as necessary.

7.7 OH&S CHEMICAL SAFETY COORDINATOR (CSC)

7.7.1 Understand and comply with all hazardous waste identification requirements as outlined in this plan.

7.7.2 Establish and maintain laboratory hazardous waste stream profiles.

7.7.3 Transport hazardous waste containers from SAAs to the CAA.

7.7.4 Review and sign manifests for shipping hazardous waste to off-site permitted storage or off-facility Treatment, Storage, or Disposal Facility as required by APC&EC Reg. 23 Subsection E of §264.

7.7.5 Ensure compliance with this plan in each area that generates waste.

7.7.6 Ensure that non-regulated waste is segregated from hazardous waste.

7.7.7 Perform periodic checks of designated Universal Waste accumulation area(s).

7.7.8 Manage the Central Accumulation Area (CAA).

7.7.9 Maintain required training as a “trained professional” IAW APC&EC Reg 23 §262.17.

7.8 OH&S LABORATORY SAFETY COORDINATOR

7.8.1 Understand and comply with all hazardous waste identification requirements as outlined in this plan.

7.8.2 Transport hazardous waste containers from SAAs to the CAA.

7.8.3 Review and sign manifests for shipping hazardous waste to off-site permitted storage or off-facility Treatment, Storage, or Disposal Facility as required by APC&EC Reg. 23 Subsection E of §264.

7.8.4 Perform periodic laboratory safety audits to ensure compliance with this plan in each area that generates waste.

7.8.5 Ensure that non-regulated waste is segregated from hazardous waste.

7.8.6 Perform periodic checks of designated Universal Waste accumulation area(s).

7.8.7 Manage the Central Accumulation Area (CAA).

7.8.8 Maintain required training as a “trained professional” IAW APC&EC Reg 23 §262.17.

7.9 PLANNING, DESIGN, AND CONSTRUCTION

7.9.1 Ensure contractors properly containerize, label, store, and/or dispose of any hazardous or universal waste generated when performing demolition, construction, or equipment maintenance work.

7.9.2 Have a thorough knowledge of the procedures contained within this plan.

7.10 PRINCIPAL INVESTIGATOR OR LABORATORY MANAGER

7.10.1 Update and maintain their laboratory’s chemical inventory.

7.10.2 Keep the quantity of hazardous chemicals on-hand in the laboratory to a minimum.

7.10.3 Identify excess chemicals in stock for disposal or return to supplier.

7.10.4 Ensure that the laboratory maintains a current and complete library of Safety Data Sheets (SDSs) for chemicals used or stored in their laboratory. SDSs may be kept as physical hardcopies in a binder maintained within the laboratory area or maintained and accessed electronically.

7.10.5 Ensure that all procedures that result in the generation of hazardous waste comply with this plan.

7.10.6 Coordinate with the Chemical Hygiene Officer (or delegate) to make hazardous waste determination of waste generated in laboratory. *(APC&EC Reg. 23 §262.214(b)(5))*

7.10.7 If their laboratory has a Satellite Accumulation Area (SAA) with a hazardous waste container(s), ensure a “Chemical Waste Pick Up” Request via the UAMS Work Order system is submitted when the container(s) is either: two-thirds full or when the current date is more than 6 months from the start accumulation date noted on the container.

7.10.8 If using SAA Waste Container Log sheets, review records for accuracy of waste indicated on the SAA Waste Container Log sheet to ensure the waste placed in the container is permitted per waste stream.

7.10.9 Perform and document a monthly internal inspection of the SAA that includes the following:

7.10.9.1 Records--review to ensure all records are up-to date and accurate.

7.10.9.2 Safety—ensure that all necessary signs are in place and hazardous waste operations are conducted in a safe manner.

7.10.9.3 Review Report-- provide the inspection log to the Chemical Hygiene Officer (or delegate). The inspection log provides the status of the SAA, abnormal conditions, and remedial actions taken.

7.10.10 Provide and document annual hazardous waste management training for all staff members. *(APC&EC Reg. 23 §262.207)* Training topics may include, but are not limited to, the following: where hazardous waste container(s) is stored in the work area, what type of waste does the lab routinely generate, SAA container labeling and management expectations, how to request a chemical waste pick up, how to respond to a spill of hazardous waste, location of spill kit materials, etc.

7.10.11 Maintain hazardous waste management training records for all staff members. *(APC&EC Reg. 23 §262.207)*

7.10.12 Ensure that internal and external communication systems are maintained in proper working order IAW APC&EC Reg. 23 §262.252.

7.10.13 Ensure compliance with all applicable hazardous waste identification requirements as outlined in this plan.

7.10.14 Ensure contractors properly containerize, label, store, and/or dispose of any hazardous or universal waste generated when performing demolition, construction, or equipment maintenance work.

7.10.15 Ensure that this plan is implemented and followed by all personnel in their laboratory.

7.10.16 Have a thorough knowledge of the procedures contained within this plan.

7.11 UAMS PERSONNEL

7.11.1 Strictly follow the HMWMP and operating procedures associated with hazardous waste management. This is both a professional obligation and a condition of employment.

7.11.2 Place hazardous and non-regulated wastes in the appropriate containers.

7.11.3 Immediately notify management about malfunctioning internal or external communication systems (e.g., intercom, phones, radios, alarms, etc.).

7.11.4 Complete training requirements for hazardous waste management within six (6) months after the date of employment. Personnel may not handle hazardous waste unsupervised in the laboratory until they have completed training.

7.11.5 All UAMS personnel involved in any waste disposal process must read and have a thorough knowledge of the procedures contained within this plan.

8.0 HAZARDOUS WASTE DISPOSAL REGULATIONS

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA), and four years later the Environmental Protection Agency (EPA) issued complex and stringent regulations to implement Subtitle C of RCRA. In 1984 the Hazardous and Solid Waste Amendments became law, substantially revising and extending the scope of RCRA. The federal government has established a comprehensive cradle to grave system of monitoring hazardous wastes from the point of generation through the point of disposal.

RCRA regulations are worded primarily to effectively control wastes produced by single waste-stream industrial generators but are applicable to universities as well. UAMS must not store, process, dispose of, transport, or offer for transport any hazardous waste without having received an EPA identification number. Nor can UAMS offer hazardous waste to transporters or Treatment, Storage and Disposal Facilities (TSDFs) which have not received an EPA identification number. Before transporting hazardous waste to an off-site facility, all requirements for packaging, labeling, marking, and placarding must be met. In addition, a uniform hazardous waste manifest must be properly executed and accompany each shipment. Any state that the hazardous waste shipment is transported through may also require a hazardous waste manifest specific for the state.

UAMS cannot treat hazardous waste on-site. Only an EPA permitted disposal facility can legally landfill, incinerate, or recycle hazardous waste under the "cradle to grave" system. A waste generator never loses liability for environmental damage. For this reason, transporters and disposal facilities must be carefully chosen. Stringent criteria have been established to minimize environmental risk and University liability.

Miscellaneous waste rules include the following:

- Volatile toxic substances should never be disposed via evaporation in a fume hood. Such substances should be collected in suitable containers and properly labeled.
- Glassware and other expendable items contaminated by hazardous chemicals must be rinsed with a suitable solvent. The rinsate must be labeled as hazardous waste and disposed appropriately. The glassware must then be collected in individual laboratories in a receptacle used for glass only.

Arkansas Division of Environmental Quality (DEQ) has final authority for all inspections of hazardous waste collection procedures, documentation, storage facilities and enforcement of Hazardous Waste Programs under APC&EC Regulation No.23.

UAMS produces more than 2200 pounds (1000 kilograms) per month of hazardous waste and is classified as a Large Quantity Generator (LQG). LQGs have a waste accumulation storage time limit of 90 days from the first day hazardous waste is moved to the Central Accumulation Area (CAA). All waste must then be transported to a permitted off-site waste disposal facility for further treatment, disposal, or recycling. Local, state, and federal law forbids the discharge of any hazardous waste into the public sanitary sewer system. In addition, it is policy of UAMS that no chemical wastes, laboratory or otherwise, be discharged into the sanitary sewer system, unless a discharge approval letter has been obtained from Little Rock Water Reclamation Authority. Any questions concerning the discharge of materials into the sanitary sewer system must be directed to the Chemical Hygiene Officer at 501-686-6958.

In conclusion, by state and federal guidelines, UAMS is required to manage hazardous wastes in a safe and environmentally sound manner. All generators of hazardous waste are held legally responsible for ensuring that the applicable regulations concerning the management and disposal of hazardous waste within your departments, laboratories, shops, or service areas are followed. The following sections are the basis of this policy.

9.0 HAZARDOUS WASTE IDENTIFICATION

Hazardous waste is waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment. To ensure proper disposal, waste-generating processes must be identified and characterized prior to segregation, handling, storage, packaging, labeling, transportation, treatment, and disposal. Additionally, it is vital to accurately identify waste to ensure compliance. Noncompliance and/or inaccurate waste classification may result in civil and criminal penalties for personnel and organizations involved. When a UAMS department contracts out any demolition, construction, or equipment maintenance work they must ensure that any hazardous waste is properly containerized, labeled, stored, and/or disposed.

The identification of a specific material as hazardous waste requires that it be listed in a Standing Operating Procedure (SOP) covering the operation that produces that waste.

The Department of Occupational Health & Safety (OH&S) is available to provide advice and guidance concerning the regulatory considerations of any proposed disposal. OH&S shall coordinate with the PI/Lab Manager (or delegate) to gain sufficient information in order to make a hazardous waste determination of the waste generated in each laboratory prior to removal of the unwanted material from the laboratory. OH&S is also responsible for record keeping and arranging for the disposal of UAMS generated hazardous wastes.

Types of hazardous waste generated at UAMS include:

- Sharps waste
- Chemical hazardous waste

- Universal waste
- Pharmaceutical waste
- Biohazardous waste
- Radioactive waste

9.1 SHARPS WASTE

All sharps shall be placed into properly labeled sharps containers or other rigid, puncture-proof containers. Make sure the container is sealed, labeled, and intact.

Sharps with both biological and chemical contamination shall be treated first as biological waste. Once the biological agents have been deactivated by either autoclave or chemical disinfection, the remaining chemical waste shall be disposed by contacting OH&S.

9.2 CHEMICAL HAZARDOUS WASTE

Chemical waste is considered hazardous if it is specifically listed as a known hazardous waste or meets the characteristics of a hazardous waste.

Chemical waste that does not exhibit any of the characteristics of hazardous waste or is not specifically listed does not mean that the chemical does not have dangerous properties. Protective measures are outlined in most safety data sheets and should be followed when handling chemicals.

Compounds identified in the “Non-hazardous Chemical Registry”, Appendix E, should also be disposed of via the hazardous waste program. If they are components of a mixture with hazardous materials, the mixture is considered hazardous waste.

9.2.1 Listed hazardous waste

Listed hazardous wastes are wastes from common manufacturing and industrial processes, specific industries, and can be generated from discarded commercial products. These wastes are specifically listed on one of four lists (the F, K, P, and U lists) found in APC&EC Reg. 23 §261 and are shown in Appendix B of this plan.

9.2.1.1 The F-list identifies seven (7) categories of wastes from common manufacturing and industrial processes as hazardous and are known as wastes from non-specific sources. A common example of F-listed type waste generated at UAMS is spent solvent waste.

9.2.1.2 The K-list identifies thirteen (13) categories of hazardous wastes from specific sectors of industry and manufacturing and are considered source-specific wastes. At this time, UAMS does not generate any K-listed type waste.

9.2.1.3 The P-list identifies ***acute*** hazardous wastes from discarded unused commercial chemical products. Rinsate and dilute spill cleanup material contaminated with these compounds are regulated. The regulations regarding acutely hazardous waste are much more stringent than those for other hazardous wastes. For example, accumulation at the point of generation is limited to only one quart or 1kg of acutely hazardous waste.

9.2.1.4 The U-list identifies ***toxic*** hazardous wastes from discarded unused commercial chemical products.

9.2.2 Hazardous waste characteristics

A hazardous waste characteristic is a property which, when present in a waste, indicates that the waste poses a sufficient threat to merit regulation as hazardous. Characteristic wastes are wastes that exhibit any one or more of the following characteristic properties: ignitability, corrosivity, reactivity, or toxicity.

9.2.2.1 Ignitability

Wastes that are hazardous due to the ignitability characteristic include:

- liquids with flash points below 60^0C (140^0F)
    - The only exception is an aqueous solution containing less than 24% alcohol where alcohol is the only ignitable constituent. This exception is made because alcohol solutions at this concentration exhibit low flash points and are not capable of supporting combustion.
- solids that cause fire through friction, moisture absorption, spontaneous chemical changes or, when ignited, burns so vigorously and persistently that it creates a hazard
    - Any solid material identified as flammable on the container, shipping paper, or SDS, should be disposed of as a regulated ignitable waste.
- ignitable compressed gases
- oxidizers
    - The following common chemicals are characterized as oxidizers at certain concentrations:
        - Chlorates
        - Chromates
        - Chromium trioxide
        - Dichromates
        - Hydrogen peroxide *(at concentrations greater than 8%)*
        - Perchlorates
        - Peroxides
        - Permanganates
        - Persulfates

9.2.2.2 Corrosivity

Wastes that are hazardous due to the corrosivity characteristic include aqueous wastes that have:

- a pH of less than or equal to 2
- a pH greater than or equal to 12.5
- the ability to corrode steel at a rate greater than 6mm (0.25 in.) per year

Wastes included in this category are solutions of strong acids and bases in concentrations greater than 0.01N. RCRA regulations permit spent corrosives to be neutralized by the generator. Neutralization must occur in a container compatible with the chemical(s) to be neutralized and must take place at the site where the waste is generated. Note: Any precipitated material produced during neutralization must be collected and properly characterized prior to disposal.

9.2.2.3 Reactivity

Wastes that are hazardous due to the reactivity characteristic may:

- be unstable under normal conditions
- react with water
- give off toxic gases
- be capable of detonation or explosion under normal conditions or when heated.

At UAMS, disposal of waste that is shock sensitive, unstable, reacts violently with air or water, or generates hydrogen sulfide or hydrogen cyanide in pH conditions between 2 and 12.5 are regulated as a reactive waste. Except for cyanide and sulfide solutions, most reactive waste should only be disposed of with the assistance of explosives experts. The generation of this waste must be avoided whenever possible. Some common chemicals that are classified as explosives include:

- Picric acid and other polynitroaromatics (in dry form)
- Old ethers and other peroxide forming organics
- Peroxides, transition-metal salts
- Perchlorate salts
- Diazonium salts, when dry
- Chlorite salts of metals (e.g., silver chlorite)
- Azides, metal, nonmetal, and organic

9.2.2.4 Toxicity

Wastes that are hazardous due to the toxicity characteristic are harmful when ingested or absorbed. Toxic wastes present a concern as they may be able to leach from waste and pollute groundwater. The toxicity of a waste is determined by the Toxicity Characteristic Leaching Procedure (TCLP).

9.3 DECONTAMINATION STORAGE TANKS

The decontamination system at UAMS consists of decontamination shower rooms in the emergency department and on the Heliport roof level and may be used to remove hazardous substances from personnel and/or equipment.

The runoff from these shower units is routed through a separate drain line into three (3) seven-hundred-fifty (750) gallon tanks. These tanks are located below grade just outside the drive entrance to the emergency department and will send an audible alarm both locally in the emergency department area and in the Call Center if the tank volume reaches 75% capacity or full capacity levels. These tanks are installed in series with a normally closed valve on the discharge line of the last tank. The discharge line is connected to the sanitary sewer. See Appendix D for a detailed schematic of the decontamination storage tanks.

Little Rock Wastewater Reclamation Authority must be notified prior to discharging the contents of the tanks to the sanitary sewer.

OH&S shall perform and document the following periodic checks:

- **REVIEW** the Decontamination Room usage logs for the UAMS Emergency Department and Heliport roof level.
- **VERIFY** decontamination storage tank volume with measuring device.

9.3.1 In the event of a level alarm for the decontamination storage tanks, follow the steps listed below.

9.3.1.1 (Person silencing the alarm) **NOTE** the time of the alarm and notify the Call Center at 501-526-0000.

9.3.1.2 (Call Center) **NOTIFY** the following personnel:

- Emergency Preparedness Manager
- Occupational Health & Safety (OH&S)
- Emergency Department Charge Nurse

9.3.1.3 Once the alarm on any tank has been activated and the personnel listed above have been notified, the following steps will be initiated by the Emergency Preparedness Manager, OH&S, and Engineering and Operations (E&O).

- (E&O) **DETERMINE** type of water level alarm (75% or full capacity)
- (OH&S) **INITIATE** testing of the water as soon as possible in preparation for discharge if proven safe
- (OH&S) **NOTIFY** appropriate outside agencies including Little Rock Wastewater Reclamation Authority
- (OH&S) **REVIEW** decontamination room logs to verify if any decontamination has been performed and when
- (Emergency Preparedness Manager) **NOTIFY** outside contractors to pump the tanks should there be the presence of contamination in the influent, if above thresholds mandated by Little Rock Wastewater Reclamation Authority
- (E&O) **RESET** the system with discharge of the tanks in the appropriate manner once all testing has been received and verified as to not have any contaminant above the thresholds determined by Little Rock Wastewater Reclamation Authority.

9.4 UNIVERSAL WASTE

Universal waste is a subcategory of hazardous waste and shall be managed IAW the universal waste requirements of APC&EC Reg. 23 §273. UAMS may generate and accumulate the following universal waste streams: batteries, lamps, mercury containing devices, and consumer electronic devices.

The E&O Warehouse supervisor serves as the main point of contact for storing and sending out Universal Waste lamps and batteries for recycling or reclamation.

When consumer electronic devices are removed from service, IT will verify any item within the device containing UAMS information (e.g., hard drives, etc.) has been removed or destroyed. The Arkansas State Surplus group will either collect the remaining hardware for resale or release it for disposal.

Refer to section 12.0 of this plan for more detailed guidance.

9.5 PHARMACEUTICAL WASTE

Pharmaceutical waste is any leftover, unused, or expired medication that is being discarded. Pharmaceutical wastes may include, but are not limited to, prescription drugs, chemotherapy agents, and controlled substances or over the counter items that are either expired, damaged or otherwise not usable for their intended purpose.

The UAMS Pharmacy is responsible for pharmaceutical licenses, medication inventory and management through the Pharmacy policy manual. Pharmacy procedures and policies identify hazardous medications using Resource Conservation and Recovery Act (RCRA) definitions and

NIOSH list of hazardous drugs in healthcare settings.

Unused and unopened pharmaceuticals are returned to the Pharmacy. Unused or expired RCRA listed pharmaceuticals are defined in UAMS Pharmacy Services policies which outline processes for the return or destruction of inventory medication.

Hazardous pharmaceutical waste is typically collected in black containers clearly labeled "hazardous waste pharmaceuticals" and are picked up by either Stericycle or OH&S. Non-hazardous pharmaceutical waste is typically collected in blue containers. See Appendix C for a quick reference guide on Waste Segregation.

The EPA requires hazardous pharmaceutical waste to be treated at a permitted treatment facility before disposal. Most pharmaceutical waste is incinerated through a licensed medical incineration site.

9.6 BIOHAZARDOUS WASTE

Biohazardous waste (also known as "Regulated Medical Waste" (RMW) or "infectious waste" or "biological waste") are wastes that may be contaminated by blood, body fluids or other potentially infectious materials, thus posing a significant risk of transmitting infection. Examples include, but are not limited to, the following:

- liquid or semi-liquid blood or other potentially infectious materials (OPIM)
- contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed
- items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling
- contaminated sharps
- pathological and microbiological wastes containing blood or OPIM

Liquid biological waste should be collected in containers for autoclaving or chemical disinfection. Autoclaved or chemically disinfected liquid wastes can be disposed via the laboratory sink. Do not pour melted agarose down the drain. Allow it to cool and solidify, then dispose of it as solid waste in biohazard waste bags.

Solid biological waste, including solidified agarose gels, should be collected in appropriate biohazard waste autoclave bags. Once the waste has been autoclaved or chemically disinfected, the bags can be taped or tied shut and contact OH&S for waste pickup. If autoclaved waste can be verified as disinfected via the use of autoclave tape, waste can be discarded as regular trash. Prior to disposal, the autoclaved waste container MUST BE defaced of the biohazard symbol, or the waste container must be placed inside an outer unmarked container.

Biological waste must be managed separately from chemical waste. The most common example where chemical waste is mistaken for biological waste is agarose gel contaminated with ethidium bromide or heavy metals (i.e. arsenic, chromium). This type of material should always be managed as chemical waste. When both chemical and biological waste types exist, the biological agent(s) should be treated first. Once the biological agents have been deactivated by either autoclave or chemical disinfection, the remaining chemical waste should be managed through OH&S.

General guidelines for disposal of biohazardous wastes are:

- **STERILIZE** or **DISINFECT** waste materials associated with viral, bacterial or other agents infectious to humans (by autoclave or chemical treatment equivalent to 1:10 bleach solution).
- **PLACE** all biohazardous wastes, except for sharps, directly into the red bag lined medical waste boxes or containers.

- **PLACE** sharps into labeled sharps containers which when filled are disposed through OH&S.
- **SEAL** the bag liner when the Medical Waste box or container is full.
- **NOTIFY** OH&S for pick up.

Departments generating biohazardous waste must have procedures in place for segregation of these wastes. See Appendix C for a quick reference guide on Waste Segregation.

Refer to the UAMS Biological Safety Plan for a complete listing and more detailed guidance.

9.7 RADIOACTIVE WASTE

Wastes that are radioactive include, but are not limited to, radioactive solid waste generated in Nuclear Medicine and/or Radiation Oncology (contaminated sharps, tubing, trash, etc.) and radioactive waste generated in research labs (contaminated trash, aqueous-based waste, flammable solvent-based waste, and liquid scintillation solutions).

All radioactive waste must be taken to OH&S for decay and disposal. Disposal of any radioactive sealed sources must also go through OH&S. For additional information, contact a Radiation Safety Officer (RSO) at 501-686-7803 or 501-526-4603.

Refer to the UAMS Radiation Safety Manual for disposal procedures and more detailed guidance.

10.0 LABORATORY CHEMICAL HAZARDOUS WASTE MANAGEMENT

Hazardous waste generated by UAMS will be disposed of IAW APC&EC Reg. 23 §262 Subpart K. UAMS personnel will collect hazardous waste at designated Satellite Accumulation Areas (SAAs) around the UAMS campus. OH&S "trained professional" personnel shall transport the accumulated waste containers from these SAAs to the Central Accumulation Area (CAA).

10.1 LABORATORY PROCEDURES

Laboratory management (i.e., PI/Lab Manager) and OH&S personnel shall ensure that Laboratory SOPs provide detailed instructions for generating, handling, and disposing of hazardous wastes to comply with requirements specified in this Plan.

10.2 LABELING AND MANAGEMENT STANDARDS FOR CONTAINERS OF UNWANTED MATERIAL

10.2.1 Satellite accumulation Area (SAA)

In general, an SAA is a location that is at or near the point of generation where hazardous wastes initially accumulate and is under the control of the operator of the process generating the waste. The volume of waste in a SAA may not exceed:

- Fifty-five (55) gallons of hazardous waste
- One (1) quart of reactive acutely hazardous waste
- One (1) kilogram of solid reactive acutely hazardous waste

For UAMS, an SAA is the room/laboratory in which the hazardous waste is generated. A Hazardous Waste Satellite Accumulation Area sign should be posted at the area where the waste is generated and stored.

Waste streams generated during laboratory processes shall have an approved waste profile prior to disposal. This waste profile shall include a description of the process being performed when the waste stream is being produced or processed and any other pertinent information associated with the waste stream collected in the container.

10.2.2 Management of SAA containers

10.2.2.1 Maintain containers in good condition and ensure any damaged containers are replaced, overpacked, or repaired.

10.2.2.2 Use containers that are compatible with their contents to avoid reactions between the contents and the container.

10.2.2.3 Store SAA containers in secondary containment whenever possible to protect against spills. Examples include but are not limited to: secondary containment platforms or plastic bins.

10.2.2.4 Personnel shall add generated waste to the appropriate container(s) located at the SAA.

- Personnel may document amounts and materials added to an accompanying log for each SAA container, if desired.

10.2.2.5 SAA containers shall be kept closed at all times unless:

- Adding, removing, or bulking unwanted material.
- A working container may be open until the end of the procedure, work shift, or until it is full, whichever comes first, at which time the working container must either be closed or the contents emptied into a separate container that is then closed.
- Venting a container is necessary. Examples include, but are not limited to, the following:
    - For the proper operation of laboratory equipment, such as with in-line collection of unwanted materials from high performance liquid chromatographs
    - To prevent dangerous situations, such as build-up of extreme pressure

10.2.3 Labeling of SAA containers

10.2.3.1 Affix an “Unwanted Material” label on the container(s) that includes, but is not limited to, the following items:

- Words “Hazardous Waste”
- Name of the chemical(s)
- Date the unwanted material first began accumulating in the container(s)
- Hazard identification (e.g., flammable, toxic, corrosive, etc.)
- When more than one chemical waste is stored in a container, the amount or approximate percentage of each constituent must be identified on the label.
- Whether the unwanted material “used” or “unused”
- Waste profile number, if applicable

10.2.4 Removal/Replacement of SAA containers

All containers of unwanted material shall be removed from each laboratory within 12 months of each container’s accumulation start date.

10.2.4.1 *(PI/Lab Managers)* Submit a “Chemical Waste Pick Up Request” of unwanted materials via the UAMS Work Order system when any one of the following occur*)*:

- containers are two-thirds full
- when the current date is more than 6 months from the start accumulation date noted on the container label

- 55 gallons or more of hazardous waste has been accumulated ***(date that 55 gallons of hazardous waste was exceeded shall be noted on the container label)***
- more than 1 quart of reactive acutely hazardous waste has been accumulated ***(date that 1 quart of reactive acutely hazardous waste was exceeded shall be noted on the container label)***
- more than 1 kg (2.2 pounds) of solid reactive acutely hazardous waste has been accumulated ***(date that 1 kg of solid reactive acutely hazardous waste was exceeded shall be noted on the container label)***

10.2.4.2 *(OH&S "trained professional" personnel)* SAA containers shall be transferred from the SAA within ten (10) days from the date of the request.

10.3 UNKNOWN WASTE

When responsible parties are leaving UAMS or changing laboratories, lack of laboratory closeout is a primary source of unknown chemicals. When an unknown is discovered, an intensive attempt at identification must be made. Usually consulting individuals who may have worked in the laboratory where the unknown was found can help to identify the contents. If this fails, the compound must be analyzed.

Generation of unknowns should be avoided by performing periodic inspections of chemicals in the laboratory to ensure that each is properly labeled.

At a minimum, all waste containers must be labeled with:

- the chemical name
- the concentration(s)
- the volume
- the date a chemical was added to a mixture

Minimal precautionary measures to be taken while handling all unknowns include:

- **ENSURE** someone else is present in the room (i.e., do not work alone)
- **HANDLE** the sample under a functioning chemical fume hood with the sash pulled to the lowest level possible
- **WEAR** chemical resistant gloves, lab coat or apron, googles, and a face shield
- **ENSURE** that a functional safety shower and eye wash station is within reasonable distance
- **ENSURE** an ABC fire extinguisher is readily available
- **RECORD** all physical and chemical tests and observations
- **LABEL** waste container
- **NOTIFY** OH&S when ready for disposal

If the unknown waste displays physical characteristics indicative of potentially reactive or peroxide forming chemicals as listed below or is suspected to be radioactive, contain biological materials, or pose any other unreasonable risk, stop the attempt to characterize the unknown waste and contact OH&S immediately. Specialized equipment and handling practices may be required.

NOTE: potential peroxide containing compounds must be labeled as "Possible Peroxide".

10.3.1 Potentially reactive chemical characteristics include:

- Solid materials under liquids
- Bi-layered or multi-layered
- Bulging, pressurized, or leaking containers
- Corroded, rusted, or deteriorating caps

10.3.2 Potential peroxide forming compound characteristics include:

- Cloudy liquid crystals forming in bottles and around lids of partially or completely evaporated liquids

10.4 CENTRAL ACCUMULATION AREA (CAA)

A CAA is any designated secured location(s) where hazardous wastes are stored/accumulated prior to off-site shipment for disposal. CAAs may be anywhere on site. They do not need to be "centrally located". CAAs are subject to the requirements in APC&EC Reg. 23 §262.17.

UAMS has one (1) CAA on campus. The CAA is located south and adjacent to Jack Stephens Drive and stores hazardous waste containers generated on-site in satellite accumulation areas.

10.4.1 CAA requirements

10.4.1.1 As a Large Quantity Generator (LQG), UAMS may not accumulate hazardous waste on site for more than 90 days once the hazardous waste containers are placed in the CAA.

10.4.1.2 Perform a weekly inspection of the CAA. At a minimum, the weekly inspection must include looking for leaking containers and for deterioration of containers caused by corrosion or other factors.

10.4.1.3 Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) from the facility's property line unless a written approval is obtained from the authority having jurisdiction over the local fire code allowing hazardous waste accumulation to occur within this restricted area. A record of the written approval must be maintained as long as ignitable or reactive hazardous waste is accumulated in this area.

10.4.1.4 No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

10.4.1.5 A container holding hazardous waste that is incompatible with any waste or other materials accumulated or stored nearby in other containers must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

10.5 LABORATORY CLEAN-OUTS

Unknowns are a special problem in laboratories, especially with regard to a change in management and/or personnel. Therefore, it is important to incorporate maintenance schedules for routine laboratory inventories and cleanup and closeout in departmental procedures. PI/Lab Managers shall complete the "Laboratory Close-Out Required Checklist" located on the UAMS website prior to closing a laboratory operation(s).

Outdated and unwanted chemicals must be disposed of prior to personnel changes that would result in the new management of a laboratory, shop, storage facility, etc. Guidelines for characterizing unknowns are available in the Laboratory Safety Manual. Laboratory closeout procedures are also available on the OH&S website.

When it is determined that a laboratory clean-out of outdated and unwanted chemicals is needed, contact OH&S. Laboratory cleanouts shall be documented and may occur one time per twelve (12) month period for each laboratory.

For the purposes of on-site accumulation, unused commercial chemical product generated solely during the laboratory clean-out is not required to count toward its hazardous waste generator status.

10.5.1 Documentation for laboratory clean-outs must:

- Identify the laboratory being cleaned out
- Indicate the date the laboratory clean-out begins and ends
- Indicate the volume of hazardous waste generated during the laboratory clean-out

10.5.2 Documentation of laboratory clean-outs must be maintained for a period of three (3) years from the date the clean-out ends.

11.0 WASTE MINIMIZATION

UAMS shall make a conscious effort to minimize the amount of waste generated at the site. An important benefit from waste minimization is that it reduces pollution that is directly related to quality of life. Waste minimization also decreases the expenses of ever-increasing chemical disposal costs. Generators should therefore modify procedures to eliminate or minimize the generation of hazardous waste by following common waste minimization techniques.

11.1 MINIMIZE REACTIVE WASTE

Materials that are considered reactive require special handling; hence the disposal of these materials is difficult and costly. Chemicals that are allowed to become shock or temperature sensitive present significant explosion hazards and cannot be land filled or incinerated. Disposal of these chemicals can only be accomplished by detonation by explosives experts. The generation of reactive waste should be avoided.

Laboratory safety can be enhanced by the elimination of generating reactive waste by purchasing peroxide forming organics in quantities that are assured of being used within a short period of time. Containers of the following chemicals should be labeled with the date they are opened and discarded and disposed of within three (3) months of the open date.

Chemicals that need to be used/discarded within three (3) months of being opened	
Disopropyl Ether (isopropyl ether)	Potassium Amide
Divinylacetylene	Sodium Amide
Potassium metal	Vinylidine Chloride

The chemicals listed below should be dated when opened and discarded within six (6) months of that date:

Chemicals that need to be used/discarded within six (6) months of being opened		
Acetaldehyde Diethyl Acetyl (acetyl)	Dioxane	Styrene
Chloroprene (2-chloro-1,3-butadiene)	Ethylene Glycol Dimethylether (glyme)	Tetrahydrofuran (THF)
Cumene (isopropyl benzene)	Ethylene Glycol Ether Acetates	Tertalin (tetrahydronapthalene)
Cyclopentene	Ethylene Glycol Monoethers (cellusolve)	Vinyl Ethers
Decalin (decahydronaphthalene)	Furan	
Diacetylene (butadiene)	Methylacetylene	
Diethyl ether (ether)	Methylcyclopentane	
Diethylene Glycol Dimethyl Ether (diglyme)	Methylisobutyl Ketone	

Additionally, containers of picric acid and similar compounds should be labeled with a checklist for monthly addition of water sufficient to form a paste equivalent to 10% moisture by weight. **Reactive**

waste should not be moved. Contact Campus Operations Call Center at 501-526-0000 to arrange for pick-up.

11.2 REDUCE THE VOLUME

Attempt to reduce the volume of hazardous waste by reducing the quantities of chemicals used in analytical procedures, substituting non-hazardous chemicals, modifying experiments, ordering chemicals in smaller quantities and using less solvent to rinse equipment. Planned purchases of only necessary quantities of chemicals and closeouts of laboratories will greatly reduce the hazardous waste output at UAMS. Besides reducing disposal costs, smaller inventories reduce potential chemical exposure to personnel, thus minimizing the risks and severity of accidents.

11.3 REDUCE CONTAMINATION (MIXTURE RULE)

Care will be used to reduce the contamination of reagent chemicals, thus reducing the amount of material discarded. When a material is mixed with hazardous waste it becomes hazardous (mixture rule), thereby increasing the amount of waste that must be disposed. Waste should be kept segregated to facilitate waste management and avoid mixing hazardous and non-hazardous waste. The UAMS Chemical Hygiene Officer has established waste profiles for all waste streams to minimize the production of hazardous waste.

11.4 RECYCLING

Many materials treated as chemical waste are actually surplus chemicals that are reusable. To assist in waste reduction, it is recommended that unopened or unwanted chemicals are transferred to laboratories where they may be used. OH&S has begun the recycling of unopened or unwanted chemicals. Recycled chemicals are provided free of charge to any interested University department or research laboratory that may have a need for these chemicals.

Laboratories are required to develop schedules for routine inventory, cleaning, and removal of chemicals that are no longer needed. These chemicals are a liability and represent a future expense as waste. OH&S can determine if these chemicals are suitable for recycling or if they should be disposed of as hazardous waste.

Chemicals listed in the table below are particularly desirable for recycling.

Desirable Chemicals for Recycling		
Solvents	**Acids**	**Oxidizers**
Acetone	Acetic acid (glacial)	Bromine
Chloroform	Hydrochloric Acid	Potassium Chlorate
Dichloromethane (Methylene Chloride)	Sulfuric Acid	Potassium Dichromate
Ethyl Acetate		Silver Nitrate
Hexanes		
Isopropyl Alcohol		
Methanol		
Petroleum Ether		

11.5 SUBSTITUTION

Substitution of a non-hazardous or less hazardous chemical in place of a hazardous chemical is a commonly used method of reducing waste. A simple example of this is to change a cleaning agent from a toxic, flammable solvent to an appropriate soap or detergent solution. Other examples of substitution include but are not limited to:

- the use of detergent instead of chromic acid in the cleaning of glassware
- the use of water-based paints and cements over solvent based
- avoiding the use of potentially explosive chemicals such as ethers or picric acid whenever possible

11.6 REDUCTION OF SCALE

Experimental laboratory procedures should be set up on as small a scale as possible. The use of methods requiring micro-quantities and equipment to handle these small volumes allow chemical reactions to be carried out on a much smaller scale than previously possible.

11.7 DONATIONS, FREE SAMPLES, AND GOVERNMENT SURPLUS OF CHEMICAL ITEMS

UAMS personnel must not accept chemical donations, free samples, or purchase large quantities of government surplus of chemical items that will later become a disposal problem. These items should not be accepted unless there is an immediate need and adequate storage space available. No chemical should be accepted which has a limited shelf life unless for immediate use and in exact quantities.

No University representative shall accept any chemical item:

- without an accompanying Safety Data Sheet
- not in an original labeled container
- without a shelf-life date

11.8 ELEMENTARY NEUTRALIZATION OF HAZARDOUS WASTES

Considerations will be given to determine if production of any hazardous by-products and wastes can be reduced and/or eliminated. For example, in-lab treatment might include “acid/base” neutralization. This process may be allowed under the very limited circumstances described in APC&EC Reg. 23 §261.10 “Elementary neutralization unit.” This process may be used if wastes are hazardous ***only*** because they exhibit the corrosivity characteristic. In these instances, the pH of the material may be adjusted to pH 5-7 and disposed of as non-regulated waste. Laboratory personnel will never conduct this process without first consulting with the Chemical Hygiene Officer.

12.0 UNIVERSAL WASTE MANAGEMENT

Universal waste may contain mercury, lead, cadmium, nickel, and other hazardous materials and shall be managed IAW the universal waste requirements of APC&EC Reg. 23 §273. Some examples of universal waste are listed below. The list is not all inclusive. In Arkansas, alkaline batteries and incandescent lamps are not considered hazardous or universal waste and may be disposed in regular trash.

Universal waste will be accumulated in a designated area. OH&S personnel shall document monthly checks of the universal waste accumulation area with the “Monthly Universal Waste Inspection Checklist”.

Lamps (*MUST BE INTACT*)	**Batteries**	**Mercury Containing Equipment**	**Consumer Electronic Devices**
Compact fluorescent	Car/Automotive	Barometers	Intact or broken cathode ray tube
Fluorescent	Hearing Aid	Blood pressure cuffs	Personal computer
High Intensity Discharge	Lead-acid	Mercury switches	Computer components
High pressure sodium	Lithium	Sphygmomanometers	Audio and/or stereo player
Mercury vapor	Nickel-Cadmium	Thermostats	Videocassette recorder/player
Metal halide	Nickel metal hydride	Thermometers	Digital videodisk (DVD) recorder/player
Neon	Rechargeable		Video camera
UV lamps	Silver oxide or Mercury		Telephones (includes cellular telephones)
			Facsimile or copying machine
			Wireless paging device

12.1 LAMPS

12.1.1 Containers

Containers must be structurally sound, rigid, and be properly closed so that no lamps can fall out.

12.1.1.1 *(E&O personnel)* **CONTACT** the E&O Warehouse supervisor to obtain containers.

12.1.1.2 *(All other UAMS personnel)* **SUBMIT** a Universal Waste Pickup Request Work Order to OH&S to collect the lamp(s).

12.1.1.3 *(OH&S personnel)* **COORDINATE** storage of lamp(s) with E&O Warehouse supervisor.

12.1.2 Labeling and Marking

12.1.2.1 *(E&O personnel)* **REMOVE** or otherwise deface any existing container labels attached to the container used to store Universal Waste lamps.

12.1.2.2 *(E&O personnel)* **ATTACH** a new UAMS “Universal Waste-Lamps” label to the container.

12.1.2.3 *(E&O personnel)* **RECORD** the date the first lamp is placed in the container on the label.

12.1.2.4 *(E&O personnel)* **RECORD** the final count of lamps within the container on the label when the container is full or needs to be shipped off site for recycling/reclamation.

12.1.3 Storage

12.1.3.1 *(E&O personnel)* **STORE** lamps inside containers.

12.1.3.2 *(E&O personnel)* **KEEP** all containers closed, except when adding lamps.

12.1.3.3 *(E&O personnel)* **USE** tape to hold box flaps shut to prevent breakage if using a box to store lamps.

12.1.4 Disposal

12.1.4.1 *(E&O personnel)* **SUBMIT** labeled and closed container to E&O Warehouse supervisor no more than 4 months after the date the first lamp is placed in the container whether the container is full or not.

12.1.4.2 *(E&O Warehouse Supervisor)* **COORDINATE** shipments Universal Waste lamps within 6 months of accumulation start date.

12.1.4.3 *(E&O Warehouse Supervisor)* **SUBMIT** copies of shipment documentation to the CHO.

12.1.5 Broken lamps

12.1.5.1 *(UAMS personnel)* **CLEAN** up broken lamps.

12.1.5.2 *(UAMS personnel)* **PLACE** broken lamps and associated broken lamp parts into a designated lamp container separate from intact lamps as parts and residues of broken lamps are now hazardous waste.

12.1.5.3 *(UAMS personnel)* **SUBMIT** a Hazardous Waste Pickup Request Work Order to OH&S for removal.

12.2 BATTERIES

12.2.1 Containers

Containers must be structurally sound, rigid, and can be properly closed so that no batteries can fall out**.**

12.2.1.1 *(E&O personnel)* **CONTACT** the E&O Warehouse supervisor to obtain containers.

12.2.1.2 *(All other UAMS personnel)* **SUBMIT** a Universal Waste Pickup Request Work Order to OH&S to collect the battery(ies).

12.2.1.3 *(OH&S personnel)* **COORDINATE** storage of battery with E&O Warehouse supervisor.

12.2.2 Labeling and Marking

12.2.2.1 *(E&O personnel)* **REMOVE** or otherwise deface any existing container labels attached to the container used to store Universal Waste batteries.

12.2.2.2 *(E&O personnel)* **TAPE** battery terminals with non-conductive tape (e.g., electrical tape, masking tape, Scotch tape, etc.)

12.2.2.3 *(E&O personnel)* **ATTACH** a “Universal Waste-Batteries” label to either the container, or directly on large batteries.

12.2.2.4 *(E&O personnel)* **RECORD** the date the first battery is placed in the container on the label.

12.2.3 Storage

12.2.3.1 *(E&O personnel)* **STORE** small batteries inside containers.

12.2.3.2 *(E&O personnel)* **KEEP** containers closed, except when adding batteries to the container.

12.2.4 Disposal

12.2.4.1 *(E&O personnel)* **SUBMIT** labeled and closed container to E&O Warehouse supervisor no more than 4 months after the date the first battery is placed in the container, whether the container is full or not.

12.2.4.2 *(E&O Warehouse Supervisor)* **COORDINATE** shipments Universal Waste batteries within 6 months of accumulation start date.

- *(OH&S CHO)* **COORDINATE** disposal of any Universal Waste batteries that are not able to go with above shipment within 6 months of accumulation start date.

12.2.4.3 *(E&O Warehouse Supervisor)* **SUBMIT** copies of shipment documentation to the CHO.

12.2.5 Broken/Leaking Batteries

12.2.5.1 *(UAMS personnel)* **CLEAN** up broken/leaking batteries.

12.2.5.2 *(UAMS personnel)* **PLACE** into a separate container from non-broken/non-leaking batteries as parts and residues of broken/leaking batteries are now hazardous waste.

12.2.5.3 *(UAMS personnel)* **SUBMIT** a Hazardous Waste Pickup Request Work Order to OH&S for removal.

12.3 MERCURY CONTAINING DEVICES

UAMS personnel shall submit a Universal Waste Pickup Request Work Order to OH&S to collect any mercury containing devices.

OH&S personnel will handle collection, storage, labeling, and disposal of mercury containing devices.

12.3.1 Containers

12.3.1.1 *(OH&S personnel)* **OBTAIN** an appropriate container(s).

- Containers are selected based on the type and size of equipment and may vary.
- Small items of mercury containing equipment may be placed in a plastic bag, double bagged, and the bags tied closed. Bags must then be placed into a structurally sound, rigid container.
- The container must be capable of being closed so that no material can fall out.

12.3.2 Labeling and Marking

12.3.2.1 *(OH&S personnel)* **ATTACH** a "Universal Waste-Mercury Containing Equipment" label to either the container or the individual piece of equipment.

12.3.2.2 *(OH&S personnel)* **RECORD** the date the first piece of equipment is placed in the container on the label.

12.3.3 Storage

12.3.3.1 *(OH&S personnel)* **KEEP** containers closed at all times, except when adding equipment to the container.

12.3.3.2 *(OH&S personnel)* **USE** secondary containment to prevent spills when appropriate.

12.3.4 Disposal

12.3.4.1 *(OH&S personnel)* **SCHEDULE** disposal of containers within 12 months of recorded accumulation date.

12.3.5 Mercury Spills/Leaking Equipment

12.3.5.1 *(UAMS personnel)* **CONTACT** OH&S to assist with cleaning of mercury spills

12.3.5.2 *(OH&S personnel)* **PLACE** mercury contaminated material into a separate container from non-broken/non-leaking equipment as any spill residues are considered hazardous waste.

12.4 CONSUMER ELECTRONIC ITEMS

Once it is determined that consumer electronic items need to be removed from service.

12.4.1 *(UAMS personnel)* **NOTIFY** either the UAMS on-site IT workstation team or UAMS Move team that items (e.g., computers, monitors, UAMS issued cell phones, etc.) need to be collected.

12.4.2 *(UAMS on-site IT workstation team or UAMS Move team)* **ARRANGE** for pickup, disposal and storage of items until the Arkansas State Surplus group takes custody of the items.

12.4.3 *(UAMS Move team)* **DETERMINE** if any item collected may contain Protected Health Information (PHI)

12.4.3.1 *(UAMS Move team)* **STAGE** any item that may contain PHI in the warehouse used by the Arkansas State Surplus group near the Distribution Center.

12.4.3.2 *(UAMS on-site IT workstation team)* **PERFORM** the following for any item that may contain PHI:

- **REMOVE** and **SHRED** the information storage component (hard drive or solid-state)
- **RECORD** the asset tag number and model information in a master spreadsheet used by the UAMS Move Team
- **AFFIX** a printed yellow label with technician's initials to indicate the storage has been removed.

12.4.3.3 *(UAMS Move team)* **COLLECT** waste from the shredder for disposal.

13.0 PERSONNEL TRAINING

Training is required for all personnel who generate, treat, handle, store, or dispose of hazardous wastes (29 CFR 1910.120, APC&EC Reg. 23 §262.17). Extensive training is provided upon initial employment and training is continuously reinforced throughout an employee's tenure at UAMS. Training for laboratory workers and students must be commensurate with their duties so they understand the requirements and can implement them.

UAMS personnel receive further training on SDSs, handling chemicals, and common laboratory hazardous wastes. UAMS personnel may receive further on-the-job training by certifying on specific procedures and/or formal job-specific site training. Personnel receive annual refresher training and undergo frequent internal and external inspections to verify operator skill and knowledge. The focus of all training is to reinforce the compliance requirements of OSHA, EPA, and State Regulations.

13.1 TRAINING REQUIREMENTS

13.1.1 For UAMS OH&S personnel that may be considered a "trained professional" and transport or manage hazardous waste:

13.1.1.1 Must successfully complete a program of classroom instruction, online training (*e.g.,* computer-based or electronic), or on-the-job training that teaches them to perform their duties in a way that ensures compliance with APC&EC Reg. 23 §262.17 for large quantity generators.

- Training must be completed within six months after the date of their employment, or assignment to the facility, or to a new position at the facility, whichever is later.
- Employees shall not work in unsupervised positions until they have completed the training.
- Employees must complete an annual review of the initial training.

13.1.1.2 This training program must be directed by a person trained in hazardous waste management procedures and must include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

13.1.1.3 At a minimum, the training program must be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including where applicable:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Response to ground-water contamination incidents

- Shutdown of operations

13.1.1.4 For facility employees that receive emergency response training pursuant to Occupational Safety and Health Administration regulations 29 CFR 1910.120(p)(8) and 1910.120(q), the large quantity generator is not required to provide separate emergency response training pursuant to this section, provided that the overall facility training meets all the conditions of exemption in this section.

13.1.1.5 The UAMS Chemical Hygiene Officer shall maintain the following documents and records at the facility:

- The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job.
- A written job description for each position related to hazardous waste management. This description may be consistent in its degree of specificity with descriptions for other similar positions in the same company location, but must include the requisite skill, education, or other qualifications, and duties of facility personnel assigned to each position.
- A written description of the type and amount of both introductory and continuing training that will be given to each person filling the position listed.
- Records that document that the training or job experience required has been given to, and completed by, facility personnel.

13.1.1.6 Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.

13.1.2 For UAMS laboratory personnel:

13.1.2.1 Training for laboratory workers and students must be commensurate with their duties so they understand the requirements and can implement them.

13.1.2.2 Training topics may include, but are not limited to, the following: where hazardous waste container(s) is stored in the work area, what type of waste does the lab routinely generate, SAA container labeling and management expectations, how to request a chemical waste pick up, how to respond to a spill of hazardous waste, location of spill kit materials, etc.

13.1.2.3 Training can be provided in a variety of ways, including, but not limited to:

- Instruction by the PI/Laboratory Manager before or during an experiment
- Formal classroom training
- Electronic/written training
- On-the job training
- Written or oral exams

13.1.2.4 Training documentation must demonstrate training for all laboratory workers that is sufficient to determine whether laboratory workers have been trained. Examples of documentation demonstrating training can include, but are not limited to, the following:

- Sign-in/attendance sheet(s) for training session(s)
- Syllabus for training session(s)
- Certificate of training completion
- Test results

13.1.2.5 The PI/Lab Manager (or delegate) shall provide, document, and maintain annual hazardous waste management training for all staff members. OH&S may assist with development of waste management training, as necessary.

13.1.2.6 Training documentation must be maintained on current personnel until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.

14.0 EMERGENCY PREVENTION

Chemical hazardous waste generated at UAMS must be managed with proper identification, labeling, storage, and disposal of materials that are regulated as hazardous waste to help prevent emergencies. The hazardous chemical waste management system must achieve the following three goals:

14.1 PROTECTION OF EMPLOYEE HEALTH AND SAFETY

The following can help protect the health and safety of employees handling or potentially exposed to hazardous chemical waste.

- Proper evaluation, packing and labeling protects the health and safety of employees.
- Periodic training of employees regarding the safe handling and proper use of chemicals and equipment used in their area(s).
- Maintain an active Industrial Hygiene exposure control management program that evaluates and controls occupational and environmental exposures to hazardous agents as well as investigates occupation illnesses and injuries reported through the Incident and Injury reporting process. The Industrial Hygiene monitoring schedule is developed annually based on prior experience and is updated as new agents are identified.
- Use engineering controls to reduce employee exposures to chemicals.
    - Building ventilation system modifications are measured to ensure the appropriate number of air exchanges in high-risk rooms to keep exposure levels to a minimum.
    - Biological safety cabinets and chemical fume hoods are inspected at least annually to ensure correct operation

14.2 REDUCTION OF HAZARDOUS CHEMICAL WASTE VOLUME

The volume of hazardous chemical waste generated at UAMS can be reduced by:

- Disposal of non-hazardous wastes separately from hazardous chemical wastes.
- Utilizing procedures for chemical waste minimization (Lab Safety Manual).
- Recycling of unused and reusable chemicals in teaching and research laboratories

14.3 COMPLIANCE WITH REGULATIONS

Compliance with this plan will help ensure that UAMS is in compliance with federal, state, and local regulations regarding packing, labeling, storage, transportation, and disposal of hazardous chemical wastes.

15.0 EMERGENCY PROCEDURES

All spills must be reported immediately to the OH&S 501-686-5536 or by calling the Campus Operations Call Center at 501-526-0000.

Emergency procedures for specific types of spills and injuries are provided in the Laboratory Safety, Radiation Safety, and Biosafety Manuals.

Laboratories should be prepared for chemical spills by having a spill kit and supervisory personnel trained to respond. The spill kit must be in an obvious location and all persons responsible for the activities conducted in the laboratory must be knowledgeable in the use of the spill kit. Spill kits can be specialized for individual laboratories or can contain general supplies necessary to handle a variety of spills. Spill kits are commercially available.

Hazardous chemical/substance spills must be cleaned as soon as possible.

If the spill exceeds five (5) liters or is an acutely hazardous substance, contact OH&S immediately.

In the event of an emergency involving a chemical spill, hazardous waste, or hazardous material release that may threaten human health or the environment, the UAMS Hazardous Materials Contingency Plan will be implemented.

15.1 HAZARDOUS MATERIALS SPILLS

A department experiencing a chemical spill can often perform clean up procedures with little or no outside help. If additional assistance is needed, the Department of Occupational Health and Safety will be contacted. Spill response will vary widely depending on circumstances. For purposes of preplanning, most spill scenarios can be characterized as to whether a known or unknown chemical is involved and if the spill is or is not confined to a laboratory hood.

15.1.1 General Chemical Spill Guidelines

Determine the extent and type of spill and contact OH&S if assistance is needed.

Follow these general guidelines when responding to a spill:

15.1.1.1 **NOTIFY** area occupants and supervisor, and evacuate the area, if necessary.

- If a volatile flammable material is spilled, **CONTROL** sources of ignition and **VENTILATE** the area by turning on the fume hoods with the sashes completely open.

15.1.1.2 **CONTACT** OH&S at 501-686-5536 or Campus Operations Call Center at 501-526-0000.

15.1.1.3 **DON** the appropriate personal protective equipment for the hazard involved.

- **REFER** to the Safety Data Sheet (SDS) or other available references for information.
- **CONTACT** OH&S if respiratory protection is required.

NOTE: The use of respiratory protection requires specialized training and medical surveillance. DO NOT enter a contaminated atmosphere without protection or use a respirator without training. When respiratory protection is used for emergency purposes, there must be another trained person outside the spill area.

15.1.1.4 **COVER/BLOCK** floor drains or any other route that could lead to an environmental release.

15.1.1.5 **USE** the appropriate absorbent media when cleaning spills.

15.1.1.6 **CIRCLE** the outer edge of the spill with absorbent material(s).

15.1.1.7 **DISTRIBUTE** spill control materials over the surface of the spill to effectively stop the liquid from spreading and minimize volatilization.

15.1.1.8 **PLACE** used sorbent materials in an appropriate container. Any used sorbent materials used on the chemical spill will most likely require disposal as hazardous waste.

- Small spills can be placed in polyethylene bags.
- Larger quantity spills may require five-gallon pails or 20-gallon drums with polyethylene liners.

15.1.1.9 **LABEL** the container with chemical name(s).

15.1.1.10 **CONTACT** OH&S at 501-686-5536 for information concerning preparing waste for disposal and for a waste pick-up.

15.1.1.11 **CLEAN** the surface where the spill occurred using a mild detergent and water.

16.0 RECORDKEEPING

16.1 GENERAL

Laboratory personnel will maintain hazardous wastes records IAW APC&EC Reg. 23 §262.13. Records shall be of sufficient detail to meet compliance requirements pursuant to Emergency Planning and Community Right To Know Act Section 311, 312, and 313.

16.2 LABORATORY PERSONNEL

Laboratory personnel generating hazardous waste are responsible for segregation and documentation of type and amount of waste produced and placed into a SAA.

16.3 TRAINING

Training for OH&S hazardous waste management personnel shall be documented and maintained by the Chemical Hygiene Officer IAW APC&EC Reg. 23 §265.16.

Training for laboratory personnel handling/managing hazardous waste shall be documented and maintained by either the specific laboratory PI/Lab Manager or the Chemical Hygiene Officer.

16.4 LABORATORY PI/LAB MANAGER

The laboratory PI/Lab Manager (or delegate) may use SAA log sheets for each SAA container in their laboratory. If using SAA log sheets, the laboratory PI/Lab Manager (or delegate) shall review the SAA log sheets on a periodic basis to ensure the waste placed in the container is permitted per the documented waste stream profile.

The laboratory PI/Lab Manager shall be responsible for a monthly internal inspection and review. During this review, the laboratory PI/Lab Manager will verify that the HMWMP is being followed. The following are review objectives to be addressed:

16.4.1 Records – Ensure all records are up-to-date and accurate.

16.4.2 Safety – Ensure that all necessary signs are in place and hazardous waste operations are conducted in a safe manner.

16.4.3 Review Report – Provide the inspection log to the Chemical Hygiene Officer (or delegate). The inspection log provides the status of the SAA, abnormal conditions, and remedial actions taken.

ACRONYMS

°C	Degrees Centigrade
°F	Degrees Fahrenheit
ADEE	Arkansas Department of Energy and Environment
APC&EC	Arkansas Pollution Control and Ecology Commission
ASTM	American Society for Testing and Materials
CAA	Central Accumulation Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHO	Chemical Hygiene Officer
CFR	Code of Federal Regulations
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
HMWMP	Hazardous Materials and Waste Management Plan
IAW	In Accordance With
IT	Information Technology
Mm	Millimeter
OH&S	Occupational Health & Safety
OSHA	Occupational Safety and Health Administration
pH	Negative Log of Hydrogen Ion Concentration
PHI	Protected Health Information
POC	Point of Contact
Ppb	Part Per Billion
SAA	Satellite Accumulation Area
SARA	Superfund Amendments and Reauthorization Act of 1986
SDS	Safety Data Sheet
SOP	Standing Operating Procedure
SW-846	Solid Waste – 846
TCLP	Toxicity Characteristic Leaching Procedure
UAMS	University of Arkansas for Medical Sciences

APPENDIX A - DOCUMENT FORMS LIST

All document forms are located and downloaded from the UAMS Web Page except Government issued forms.

NOTE

To view or print the most current forms:

- **GO TO** the UAMS Web Site.
- **CLICK** on the "UAMS Occupational Health and Safety" link and type the form title in the "search" bar.

Form ID	Form Title
N/A	Laboratory Close-Out Required Checklist
N/A	Monthly Universal Waste Inspection Checklist
N/A	SAA Waste Container Log
N/A	Monthly SAA Inspection Log

APPENDIX B - LISTED HAZARDOUS WASTES

Lists of Hazardous Wastes

(1) General.

A solid waste is a hazardous waste if it is listed below, unless it has been excluded from this list under Regulation 23 or types of wastes by employing one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

Each hazardous waste listed in this appendix is assigned an EPA or Arkansas Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the notification requirements of Section 3010 of the RCRA and certain recordkeeping and reporting requirements.

Hazardous Waste Number	Hazardous Waste	Hazard Code
Generic:		
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)*
F004	The following spent non-halogenated solvents: cresols and	(T)

Hazardous Waste Number	Hazardous Waste	Hazard Code
	cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)
F007	Spent cyanide plating bath solutions from electroplating operations.	(R,T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R,T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R,T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R,T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R,T)

* (I,T) should be used to specify mixtures containing ignitable and toxic constituents.

Listing Specific Definitions:

1. For the purposes of the F037 and F038 listings, oil/ water/solids is defined as oil and/or water and/or solids.

2. For the purposes of the F037 and F038 listings, aggressive biological treatment units are defined as units which employ one of the following four treatment methods: activated sludge; trickling filter; rotating biological contactor for the continuous accelerated biological oxidation of wastewaters; or high-rate aeration. High-rate aeration is a system of surface impoundments or tanks, in which intense mechanical aeration is used to completely mix the wastes, enhance biological activity, and the units employs a minimum of 6 hp per million gallons of treatment volume; and either the hydraulic retention time of the unit is no longer than 5 days; or the hydraulic retention time is no longer than 30 days and the unit does not generate a sludge that is a hazardous waste by the Toxicity Characteristic.

3. Generators and treatment, storage and disposal facilities have the burden of proving that their sludges are exempt from listing as F037 and F038 wastes under this definition. Generators and treatment, storage and disposal facilities must maintain, in their operating or other on-site records, documents and data sufficient to prove that:

   - the unit is an aggressive biological treatment unit as defined in this subparagraph; and
   - the sludge's sought to be exempted from the definitions of F037 and/or F038 were actually generated in the aggressive biological treatment unit.

4. For the purposes of the F037 listing, sludges are considered to be generated at the moment of deposition in the unit, where deposition is defined as at least a temporary cessation of lateral particle movement.

5. For the purposes of the F038 listing, sludges are considered to be generated at the moment of deposition in the unit, where deposition is defined as at least a temporary cessation of lateral particle movement, and floats are considered to be generated at the moment they are formed in the top of the unit.

(2) Hazardous wastes from specific sources.

Solid wastes that are listed hazardous wastes from specific sources have not been listed in this reference document because at the time of printing none applied to UAMS research and learning activities.

(3) Commercial Chemical Products

Commercial chemical products that are in their pure state, are out of date or off specification are hazardous wastes if listed below. Those wastes that have an EPA identification number beginning with the letter P are considered acutely hazardous. No more than 1 liter of acutely hazardous waste can be generated at UAMS per month. In the event that more than 1 liter of acutely hazardous waste is generated in a one-month period UAMS will become a large quantity generator and must abide by the rules and regulations set forth by local, state and federal governmental authorities.

Hazardous Waste No.	Chemical Abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P203	1646-88-4	Aldicarb sulfone
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P008	504-24-5	5-(Aminomethyl)-3-isoxazolol
P007	2763-96-4	4-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate(1-), bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H_3AsO_4
P012	1327-53-3	Arsenic oxide As_2O_3
P011	1303-28-2	Arsenic oxide As_2O_5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P067	75-55-8	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro-

Hazardous Waste No.	Chemical Abstracts No.	Substance
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methyl-amino)ethyl]-, (R)-
P046	122-09-8	Benzeneethanamine, alpha, alpha-dimethyl-
P014	108-98-5	Benzenethiol
P127	1563-66-2	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate
P188	57-64-7	Benzoic acid, 2-hydroxy-,compd. With (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo [2,3-b]indol-5-yl methylcarbamate ester (1:1)
P001	[1] 81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium powder
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P045	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[methylamino)carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide $Ca(CN)_2$
P189	55282-14-8	Carbamic acid, [(dibutylamino)-thio]methyl-2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester
P191	644-64-4	Carbamic acid, dimethyl-, 1-[(dimethyl-amino) carbonyl]-5-methyl-1H-pyrozol-3-yl ester
P192	119-38-0	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester
P190	1129-41-5	Carbamic acid, methyl-, 3-methylphenyl ester
P127	1563-66-2	Carbofuran
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P189	55285-14-8	Carbosulfan
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl)thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide
P029	544-92-3	Copper cyanide Cu(CN)
P202	64-00-6	m-Cumenyl methylcarbamate
P030		Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P033	506-77-4	Cyanogen chloride (CN)Cl
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P191	644-64-4	Dimetilan
P043	55-91-4	Diisopropylfluorophosphate (DFP)

Hazardous Waste No.	Chemical Abstracts No.	Substance
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha, 4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1alpha,2beta, 2alpha,3beta,6beta,6alpha,7beta, 7alpha)-
P051	[1]72-20-8	2,7:3,6-Dimethanonaphth [2,3-b]oxirene,3,4,5,6,9, 9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1alpha,2beta, 2beta,3alpha,6alpha,6beta,7beta, 7alpha)-, & metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P047	[1]534-52-1	4,6-Dinitro-o-cresol, & salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-04-4	Disulfoton
P049	541-53-7	Dithiobiuret
P185	26419-73-8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, o-[(methylamino)-carbonyl]oxime
P050	115-29-7	Endosulfan
P088	145-73-3	Endothall
P051	72-20-8	Endrin
P051	72-20-8	Endrin, & metabolites
P042	51-43-4	Epinephrine
P031	460-19-5	Ethanedinitrile
P066	16752-77-5	Ethanimidothioic acid, N-[[(methylamino)carbonyl] oxy]-, methyl ester
P194	23135-22-0	Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino) carbonyl]-2-oxo]-, methyl ester
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P198	23422-53-9	Formetanate hydrochloride
P197	17702-57-7	Formparanate
P065	628-86-4	Fulminic acid, mercury(2+) salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyl tetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P060	465-73-6	Isodrin

Hazardous Waste No.	Chemical Abstracts No.	Substance
P192	119-38-0	Isolan
P202	64-00-6	3-Isopropylphenyl N-methylcarbamate
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P196	15339-36-3	Manganese, bis(dimethylcarbamodithioato-S,S')-,
P196	15339-36-3	Manganese dimethyldithiocarbamate
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P198	23422-53-9	Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride
P197	17702-57-7	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl]oxl]phenyl]-
P199	2032-65-7	Methiocarb
P082	62-75-9	Methanamine, N-methyl-N-nitroso-
P064	624-83-9	Methane, isocyanato-
P016	542-88-1	Methane, oxybis[chloro-
P112	509-14-8	Methane, tetranitro-(R)
P118	75-70-7	Methanethiol, trichloro-
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P190	1129-41-5	Metolcarb
P066	16752-77-5	Methomyl
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P128	315-8-4	Mexacarbate
P072	86-88-4	alpha-Naphthylthiourea
P073	13463-39-3	Nickel carbonyl
P073	13463-39-3	Nickel carbonyl $Ni(CO)_4$, (T-4)-
P074	557-19-7	Nickel cyanide
P074	557-19-7	Nickel cyanide $Ni(CN)_2$
P075	[1] 54-11-5	Nicotine, & salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide NO
P078	10102-44-0	Nitrogen oxide NO_2
P081	55-63-0	Nitroglycerine (R)
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P085	152-16-9	Octamethylpyrophosphoramide
P087	20816-12-0	Osmium oxide OsO_4, (T-4)-
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P194	2315-22-0	Oxamyl
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P128	315-18-4	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)

Hazardous Waste No.	Chemical Abstracts No.	Substance
P199	2032-65-7	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate
P048	51-28-5	Phenol, 2,4-dinitro-
P047	[1]534-52-1	Phenol, 2-methyl-4,6-dinitro, & salts
P202	64-00-6	Phenol, 3-(1-methylethyl)-, methyl carbamate
P201	2631-37-0	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene
P096	7803-51-2	Phosphine
P041	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P097	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl] phenyl] O,O-dimethyl ester
P071	298-00-0	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
P204	57-47-6	Physostigmine
P188	57-64-7	Physostigmine salicylate
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide
P098	151-50-8	Potassium cyanide K(CN)
P099	506-61-6	Potassium silver cyanide
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino) carbonyl]oxime
P201	2631-37-0	Promecarb
P203	1646-88-4	Propanal, 2-, methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	107-19-7	2-Propyn-1-ol
P008	504-24-5	4-Pyridinamine

Hazardous Waste No.	Chemical Abstracts No.	Substance
P075	[1]54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, and salts
P204	57-47-6	Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-
P114	12039-52-0	Selenious acid, dithallium(1+) salt
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P104	506-64-9	Silver cyanide (Ag(CN)
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P106	143-33-9	Sodium cyanide Na(CN)
P108	[1]57-24-9	Strychnidin-10-one, and salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	[1]57-24-9	Strychnine, & salts
P115	7446-18-6	Sulfuric acid, dithallium(1+) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethyl pyrophosphate
P112	509-14-8	Tetranitromethane (R)
P062	757-58-4	Tetraphosphoric acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium oxide Tl_2O_3
P114	12039-52-0	Thallium(1) selenite
P115	7446-18-6	Thallium(I) sulfate
P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide$[(H_2N)C(S)]_2NH$
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P185	26419-73-8	Tirpate
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium oxide V_2O_5
P120	1314-62-1	Vanadium pentoxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P001	[1]81-81-2	Warfarin, & salts, when present at concentrations greater than 0.3%
P205	137-30-4	Zinc, bis(dimethylcarbamodithioato-S,S')-,
P121	557-21-1	Zinc cyanide
P121	557-21-1	Zinc cyanide $Zn(CN)_2$
P122	1314-84-7	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)
P205	137-30-4	Ziram

[1] CAS Number given for parent compound only.

The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in Regulation 23 are identified as toxic wastes (T) unless otherwise designated. There is a small quantity exclusion that applies to these wastes. Contact the OH&S for more information.

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous Waste No.	Chemical Abstracts No.	Substance
U394	30558-43-1	A2213
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-
U240	[1] 94-75-7	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters
U112	141-78-6	Acetic acid ethyl ester (I)
U144	301-04-2	Acetic acid, lead(2+) salt
U214	563-68-8	Acetic acid, thallium(1+) salt
See F027	93-76-5	Acetic acid, (2,4,5-trichloro phenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid (I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U136	75-60-5	Arsinic acid, dimethyl-
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U010	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a] indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1alpha, 8beta,8aalpha,8balpha)]-
U280	101-27-9	Barban
U278	22781-23-3	Bendiocarb
U364	22961-82-6	Bendiocarb phenol
U271	17804-35-2	Benomyl
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	225-51-4	Benz[c]acridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N- (1,1-dimethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U012	62-53-3	Benzenamine (I,T)
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-,hydrochloride
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-,hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-

Hazardous Waste No.	Chemical Abstracts No.	Substance
U019	71-43-2	Benzene (I,T)
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha- (4-chlorophenyl)-alpha-hydroxy-,ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	72-54-8	Benzene, 1,1'-(2,2-dichloroethyli-dene)bis[4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl-(I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro-
U183	608-93-5	Benzene, pentachloro-
U185	82-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U020	98-09-9	Benzenesulfonyl chloride (C,R)
U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-
U023	98-07-7	Benzene, (trichloromethyl)-
U234	99-35-4	Benzene, 1,3,5-trinitro-
U021	92-87-5	Benzidine
U202	[1] 81-07-2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U278	22781-23-3	1,3-Benzodioxol-4-ol,2,2-dimethyl-, methyl carbamate
U364	22961-82-6	1,3,Benzodioxol-4-ol,2,2-dimethyl-,
U367	1563-38-8	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-
U064	189-55-9	Benzo[rst]pentaphene
U248	[1]81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3- (3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations of 0.3% or less
U022	50-32-8	Benzo[a]pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine

Hazardous Waste No.	Chemical Abstracts No.	Substance
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U225	75-25-2	Bromoform
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone, peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)
U143	303-34-4	2-Butenoic acid, 2-methyl-,7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-
U031	71-36-3	n-Butyl alcohol (I)
U136	75-60-5	Cacodylic acid
U032	13765-19-0	Calcium chromate
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U372	10605-21-7	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester
U271	17804-35-2	Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl], methyl ester
U280	101-27-9	Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester
U373	122-42-9	Carbamic acid, phenyl-, 1-methylethyl ester
U409	23564-05-8	Carbamic acid, [1,2-phenylene bis(iminocarbonothiol)]bis-, dimethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	[1]111-54-6	Carbamodithioic acid, 1,2-ethane-diylbis-, salts & esters
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro- 2-propenyl) ester
U389	2303-17-5	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester
U387	52888-80-9	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester
U279	63-25-2	Carbaryl
U372	10605-21-7	Carbendazim
U367	1563-38-8	Carbofuran phenol
U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U033	353-50-4	Carbonic difluoride
U156	79-22-1	Carbonochloridic acid, methyl ester(I,T)
U033	353-50-4	Carbon oxyfluoride (R,T)
U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	57-74-9	Chlordane, alpha & gamma isomers
U026	494-03-1	Chlornaphazine
U037	108-90-7	Chlorobenzene
U038	510-15-6	Chlorobenzilate
U039	59-50-7	p-Chloro-m-cresol

Hazardous Waste No.	Chemical Abstracts No.	Substance
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid H_2CrO_4, calcium salt
U050	218-01-9	Chrysene
U051		Creosote
U052	1319-77-3	Cresol (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide (CN)Br
U197	106-51-4	2,5-Cyclohexadiene-1,4-dione
U056	110-82-7	Cyclohexane (I)
U129	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexa-chloro-, (1alpha, 2alpha,3beta,4alpha,5alpha,6beta)-
U057	108-94-1	Cyclohexanone (I)
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	50-18-0	Cyclophosphamide
U240	[1] 94-75-7	2,4-D, salts and esters
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz[a,h]anthracene
U064	189-55-9	Dibenzo[a,i]pyrene
U066	96-12-8	1,2-Dibromo-3-chloropropane
U069	84-74-2	Dibutyl phthalate
U070	95-50-1	o-Dichlorobenzene
U071	541-73-1	m-Dichlorobenzene
U072	106-46-7	p-Dichlorobenzene
U073	91-94-1	3,3'-Dichlorobenzidine
U074	764-41-0	1,4-Dichloro-2-butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U078	75-35-4	1,1-Dichloroethylene
U079	156-60-5	1,2-Dichloroethylene
U025	111-44-4	Dichloroethyl ether
U027	108-60-1	Dichloroisopropyl ether
U024	111-91-1	Dichloromethoxy ethane
U081	120-83-2	2,4-Dichlorophenol
U082	87-65-0	2,6-Dichlorophenol
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U395	5952-26-1	Diethylene glycol, dicarbamate
U108	123-91-1	1,4-Diethyleneoxide
U028	117-81-7	Diethylhexyl phthalate
U086	1615-80-1	N,N'-Diethylhydrazine
U087	3288-58-2	O,O-Diethyl S-methyl dithiophosphate
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstilbesterol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	124-40-3	Dimethylamine (I)

Hazardous Waste No.	Chemical Abstracts No.	Substance
U093	60-11-7	p-Dimethylaminoazobenzene
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	alpha,alpha-Dimethylbenzylhydro-peroxide (R)
U097	79-44-7	Dimethylcarbamoyl chloride
U098	57-14-7	1,1-Dimethylhydrazine
U099	540-73-8	1,2-Dimethylhydrazine
U101	105-67-9	2,4-Dimethylphenol
U102	131-11-3	Dimethyl phthalate
U103	77-78-1	Dimethyl sulfate
U105	121-14-2	2,4-Dinitrotoluene
U106	606-20-2	2,6-Dinitrotoluene
U107	117-84-0	Di-n-octyl phthalate
U108	123-91-1	1,4-Dioxane
U109	122-66-7	1,2-Diphenylhydrazine
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n-propylnitrosamine
U041	106-89-8	Epichlorohydrin
U001	75-07-0	Ethanal (I)
U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U404	121-44-8	Ethanamine, N,N-diethyl-
U155	91-80-5	1,2,Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienyl-methyl)-
U067	106-93-4	Ethane, 1,2-dibromo-
U076	75-34-3	Ethane, 1,1-dichloro-
U077	107-06-2	Ethane, 1,2-dichloro-
U131	67-72-1	Ethane, hexachloro-
U024	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U117	60-29-7	Ethane, 1,1'-oxybis- (I)
U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U184	76-01-7	Ethane, pentachloro-
U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U218	62-55-5	Ethanethioamide
U226	71-55-6	Ethane, 1,1,1-trichloro-
U227	79-00-5	Ethane, 1,1,2-trichloro-
U410	59669-26-0	Ethaninidothioic acid, N,N'-[thiobis[(methylimino) carbonyloxy]]bis-, dimethyl ester
U394	30558-43-1	Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester
U359	110-80-5	Ethanol, 2-ethoxy-
U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U004	98-86-2	Ethanone, 1-phenyl-
U395	5952-26-1	Ethanol, 2,2'-oxybis-, dicarbamate
U043	75-01-4	Ethene, chloro-
U042	110-75-8	Ethene, (2-chloroethoxy)-
U078	75-35-4	Ethene, 1,1-dichloro-
U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U210	127-18-4	Ethene, tetrachloro-
U228	79-01-6	Ethene, trichloro-
U112	141-78-6	Ethyl acetate (I)
U113	140-88-5	Ethyl acrylate (I)
U238	51-79-6	Ethyl carbamate (urethane)

Hazardous Waste No.	Chemical Abstracts No.	Substance
U117	60-29-7	Ethyl ether (I)
U114	[1] 111-54-6	Ethylenebisdithiocarbamic acid, salts & esters
U067	106-93-4	Ethylene dibromide
U077	107-06-2	Ethylene dichloride
U359	110-80-5	Ethylene glycol monoethyl ether
U115	75-21-8	Ethylene oxide (I,T)
U116	96-45-7	Ethylenethiourea
U076	75-34-3	Ethylidene dichloride
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethyl methanesulfonate
U120	206-44-0	Fluoranthene
U122	50-00-0	Formaldehyde
U123	64-18-6	Formic acid (C,T)
U124	110-00-9	Furan (I)
U125	98-01-1	2-Furancarboxaldehyde (I)
U147	108-31-6	2,5-Furandione
U213	109-99-9	Furan, tetrahydro- (I)
U125	98-01-1	Furfural (I)
U124	110-00-9	Furfuran (I)
U206	18883-66-4	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-
U206	18883-66-4	D-Glucose, 2-deoxy-2-[[(methyl-nitrosoamino)-carbonyl]amino]-
U126	765-34-4	Glycidylaldehyde
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U130	77-47-4	Hexachlorocyclopentadiene
U131	67-72-1	Hexachloroethane
U132	70-30-4	Hexachlorophene
U243	1888-71-7	Hexachloropropene
U133	302-01-2	Hydrazine (R,T)
U086	1615-80-1	Hydrazine, 1,2-diethyl-
U098	57-14-7	Hydrazine, 1,1-dimethyl-
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U109	122-66-7	Hydrazine, 1,2-diphenyl-
U134	7664-39-3	Hydrofluoric acid (C,T)
U134	7664-39-3	Hydrogen fluoride (C,T)
U135	7783-06-4	Hydrogen sulfide
U135	7783-06-4	Hydrogen sulfide H2S
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U116	96-45-7	2-Imidazolidinethione
U137	193-39-5	Indeno[1,2,3-cd]pyrene
U190	85-44-9	1,3-Isobenzofurandione
U140	78-83-1	Isobutyl alcohol (I,T)
U141	120-58-1	Isosafrole
U142	143-50-0	Kepone
U143	303-34-4	Lasiocarpine
U144	301-04-2	Lead acetate
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U129	58-89-9	Lindane
U163	70-25-7	MNNG

Hazardous Waste No.	Chemical Abstracts No.	Substance
U147	108-31-6	Maleic anhydride
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U152	126-98-7	Methacrylonitrile (I,T)
U092	124-40-3	Methanamine, N-methyl- (I)
U029	74-83-9	Methane, bromo-
U045	74-87-3	Methane, chloro- (I,T)
U046	107-30-2	Methane, chloromethoxy-
U068	74-95-3	Methane, dibromo-
U080	75-09-2	Methane, dichloro-
U075	75-71-8	Methane, dichlorodifluoro-
U138	74-88-4	Methane, iodo-
U119	62-50-0	Methanesulfonic acid, ethyl ester
U211	56-23-5	Methane, tetrachloro-
U153	74-93-1	Methanethiol (I,T)
U225	75-25-2	Methane, tribromo-
U044	67-66-3	Methane, trichloro-
U121	75-69-4	Methane, trichlorofluoro-
U036	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U154	67-56-1	Methanol (I)
U155	91-80-5	Methapyrilene
U142	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U247	72-43-5	Methoxychlor
U154	67-56-1	Methyl alcohol (I)
U029	74-83-9	Methyl bromide
U186	504-60-9	1-Methylbutadiene (I)
U045	74-87-3	Methyl chloride (I,T)
U156	79-22-1	Methyl chlorocarbonate (I,T)
U226	71-55-6	Methyl chloroform
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK)(I,T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I,T)
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	Methylthiouracil
U010	50-07-7	Mitomycin C
U059	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U167	134-32-7	1-Naphthalenamine
U168	91-59-8	2-Naphthalenamine
U026	494-03-1	Naphthalenamine, N,N'-bis(2-chloroethyl)-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione

Hazardous Waste No.	Chemical Abstracts No.	Substance
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl [1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U279	63-25-2	1-Naphthalenol, methylcarbamate
U166	130-15-4	1,4,Naphthaquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U217	10102-45-1	Nitric acid, thallium(1+) salt
U169	98-95-3	Nitrobenzene (I,T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropropane (I,T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitroso-N-methylurea
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-8	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine,N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)
U126	765-34-4	Oxiranecarboxyaldehyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
See F027	87-86-5	Pentachlorophenol
U161	108-10-1	Pentanol, 4-methyl-
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U411	114-26-1	Phenol, 2-(1-methylethoxy)-, methylcarbamate
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U101	105-67-9	Phenol, 2,4-dimethyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U170	100-02-7	Phenol, 4-nitro-
See F027	87-86-5	Phenol, pentachloro-
See F027	58-90-2	Phenol, 2,3,4,6-tetrachloro-
See F027	95-95-4	Phenol, 2,4,5-trichloro-
See F027	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	7446-27-7	Phosphoric acid, lead(2+) salt (2:3)
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U189	1314-80-3	Phosphorous sulfide (R)
U190	85-44-9	Phthalic anhydride

Hazardous Waste No.	Chemical Abstracts No.	Substance
U191	109-06-8	2-Picoline
U179	100-75-4	Piperidine, 1-nitroso-
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I,T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U083	78-87-5	Propane, 1,2-dichloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I,T)
U027	108-60-1	Propane, 2,2'-oxybis[2-chloro-
U193	1120-71-4	1,3-Propane sultone
See F027	93-72-1	Propanoic acid, 2-(2,4,5-trichloro-phenoxy)-
U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl-(I,T)
U002	67-64-1	2-Propanone (I)
U007	79-06-1	2-Propenamide
U084	542-75-6	1-Propene, 1,3-dichloro-
U243	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	107-13-1	2-Propenenitrile
U152	126-98-7	2-Propenenitrile, 2-methyl-(I,T)
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U373	122-42-9	Propham
U411	114-26-1	Propoxur
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U387	52888-80-9	Prosulfocarb
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro-
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4-(1H,3H)-Pyrimidinedione, 5-[bis (2-chloroethyl) amino]-
U164	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine
U201	108-46-3	Resorcinol
U202	[1] 81-07-2	Saccharin, & salts
U203	94-59-7	Safrole
U204	7783-00-8	Selenious acid
U204	7783-00-8	Selenium dioxide
U205	7488-56-4	Selenium sulfide
U205	7488-56-4	Selenium sulfide SeS_2 (R,T)
U015	79-34-5	L-Serine, diazoacetate (ester)
See F027	115-02-6	Silvex (2,4,5-TP)
U206	93-72-1	Streptozotocin
U103	18883-66-4	Sulfuric acid, dimethyl ester
U189	77-78-1	Sulfur phosphide (R)
See F027	1314-80-3	2,4,5-T
U207	93-76-5	1,2,4,5-Tetrachlorobenzene
U208	95-94-3	1,1,1,2-Tetrachloroethane
U209	630-20-6	1,1,2,2-Tetrachloroethane

Hazardous Waste No.	Chemical Abstracts No.	Substance
U210	127-18-4	Tetrachloroethylene
See F027	58-90-2	2,3,4,6-Tetrachlorophenol
U213	109-99-9	Tetrahydrofuran (I)
U214	563-68-8	Thallium(I) acetate
U215	6533-73-9	Thallium(I) carbonate
U216	7791-12-0	Thallium(I) chloride
U216	7791-12-0	Thallium chloride TlCl
U217	10102-45-1	Thallium(I) nitrate
U218	62-55-5	Thioacetamide
U410	59669-26-0	Thiodicarb
U153	74-93-1	Thiomethanol (I,T)
U244	137-26-8	Thioperoxydicarbonic diamide[$(H_2N)C(S)]_2S_2$, tetramethyl-
U409	23564-05-8	Thiophanate-methyl
U219	62-56-6	Thiourea
U244	137-26-8	Thiram
U220	108-88-3	Toluene
U221	25376-45-8	Toluenediamine
U223	26471-62-5	Toluene diisocyanate (R,T)
U328	95-53-4	o-Toluidine
U353	106-49-0	p-Toluidine
U222	636-21-5	o-Toluidine hydrochloride
U389	2303-17-5	Triallate
U011	61-82-5	1H-1,2,4-Triazol-3-amine
U227	79-00-5	1,1,2-Trichloroethane
U228	79-01-6	Trichloroethylene
U121	75-69-4	Trichloromonofluoromethane
See F027	95-95-4	2,4,5-Trichlorophenol
See F027	88-06-2	2,4,6-Trichlorophenol
U404	121-44-8	Triethylamine
U234	99-35-4	1,3,5-Trinitrobenzene (R,T)
U182	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	126-72-7	Tris(2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U237	66-75-1	Uracil mustard
U176	59-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U043	75-01-4	Vinyl chloride
U248	[1] 81-81-2	Warfarin, & salts, when present at concentrations of 0.3% or less
U239	1330-20-7	Xylene (I)
U200	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta, 20alpha)-
U249	1314-84-7	Zinc phosphide, Zn_3P_2, when present at concentrations of 10% or less

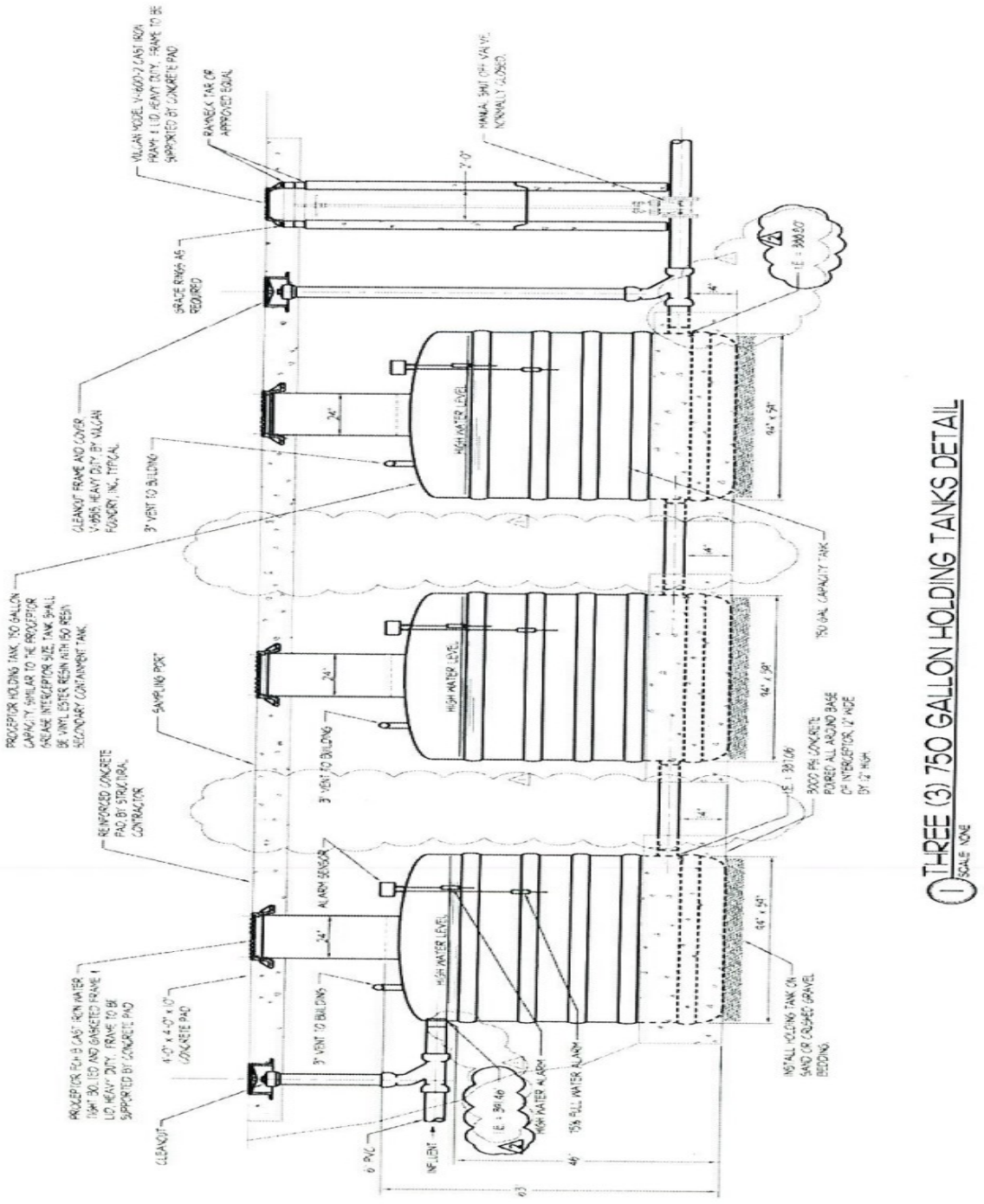
CAS Number given for parent compound only.

APPENDIX C - WASTE SEGREGATION QUICK REFERENCE GUIDE

SHARPS Rigid Red Container with Biohazard Label	**BIOHAZARD WASTE** Red Liner & Container with Biohazard Label	**TRACE CHEMO WASTE** Yellow Rigid Container	**TRASH** Clear Trash Bags with Trash Can
-Needles & Syringes -Ampules & Glass Bottles -Broken Glass -Blades & Scalpels -Sutures & Scissors -Staples -Used Vaccine Vials -IV Catheters & Stylets -IV Butterflies -Any Other Sharps *Do not fill past fill line. *Close lid once full & place work order for pickup. 	-Infectious Waste -Blood & Blood Products -Foley or IV with visible Blood -**Heavily Soiled** Gauze or Dressing (**with blood or OPIM**) -Suction Canisters or Other Infectious Liquids (**must use solidifier**) -Post-Partum Sanitary Pads *Anything Soaked with Blood or Other Potentially Infectious Material (OPIM) *Not urine or feces. 	-Items Contaminated with Chemo or that once contained chemo (but are now empty): • Foley & Bag • Sharps • Emesis Basin • Bedpan • Urinal • Chemo Gloves • IV & Tubing *Partially fully Chemo IV Bags go in black bins. 	-IV Tubing (**no visible blood**) -Empty Bedpans, Urinals, & Emesis Basins -Empty Foley Catheter & Bag (**no visible blood**) -**Lightly Soiled** Gauze or Dressing -Gloves, Gowns, & Other **Lightly Soiled** PPE -Packing & Boxes -Food & Food Packaging -Used Tissues & Paper Towels *Do not use Biohazard Bags in Regular Trash. 
BULK CHEMO WASTE (RCRA HAZARDOUS DRUG WASTE) Black Rigid Containers	**NON-RCRA PHARMACEUTICAL WASTE** Blue Bins	**LINENS** Mint Bags that go in Linen Cart	**RADIOACTIVE WASTE** Blue Bags
*Follow Pyxis Instructions. -RCRA Hazardous Meds. -Half/Partial Doses of Chemo. -Bulk Chemo. P & U-Listed Drugs: sole active ingredient & not used for intended purpose. *Clear Bag P-List Drugs first. RCRA Hazardous Drugs: ignitable, corrosive, reactive, & toxic. *Unused Chemo & Controlled Drugs must go back to the pharmacy. 	*Follow Pyxis Instructions.  *Blue drug waste non-RCRA, and non-Chemo waste. (Commonly called non-hazardous drug waste, but this is a misnomer). **CONTROLLED DRUG WASTE** Stericycle CsRX Beige Bin *Follow Pyxis Instructions. 	-Used Cloth/Linen -Towels & Sheets -Pillowcases -Washcloths -Gowns *Infant Sleep Sacks: Purple Bags & separate container 	-Radioactive Waste *Do not touch unless you are trained to do so. *Contact OHS-Radiation Safety if you have any questions. RADIOACTIVE MATERIALS

Questions or need help: UAMS Call Center 501-526-0000

APPENDIX D - UAMS EMERGENCY DEPARTMENT DECONTAMINATION WASTE STORAGE TANKS



1 THREE (3) 750 GALLON HOLDING TANKS DETAIL
SCALE: NONE

APPENDIX E - NON-REGULATED CHEMICAL WASTE

CAS#	Chemical/Compound Name
50817B	ASCORBIC ACID
7440440A	ACTIVATED CARBON
58617A	ADENOSINE, (-)-
9002180A	AGAR
9012366A	AGAROSE
302727A	ALANINE, DL-
56417A	ALANINE, L-
338692A	ALANINE-D
UOFM1485A	ALCONOX
9005327A	ALGINIC ACID
9005383A	ALGINIC ACID, SODIUM SALT
12141467B	ALUMINUM SILICATE
10102713A	ALUMINUM SODIUM SULFATE
10043013S	ALUMINUM SULFATE, Anhydrous solid
9000026A	AMBER
9002260A	AMBERLITE IRA-410CP
56406B	AMINOACETIC ACID
9037223A	AMIOCA
7722761A	AMMONIUM PHOSPHATE MONOBASIC
7783280A	AMMONIUM PHOSPHATE, DIBASIC
528949A	AMMONIUM SALICYLATE
1002897A	AMMONIUM STEARATE
7783202A	AMMONIUM SULFATE
42739388A	AMMONIUM VALERATE
7631869C	AMORPHOUS FUMED SILICA
9037223B	AMYLOPECTIN
31566311B	ARLACEL
50817A	ASCORBIC ACID, L-
5794138A	ASPARAGINE HYDRATE, (L)-
617458A	ASPARTIC ACID, DL-
UOFM1252A	ASPHALT
112856A	BEHENIC ACID
12141467A	BENTONITE
2447576B	BENEZENESULFONAMIDE, 4-AMINO N-(5,6-DIMETHOXY-4-PYRIMIDINYL)
121346C	BENZOIC ACID, 4-HYDROXY-3-METHOXY
9012366B	BIO-GEL A
UOFM235A	BIO-LYTE AMPHOLXLES AND GELS
813934A	BISMUTH CITRATE
UOFM1252B	BITUMEN
7758874B	BONE FLOUR
507700a	BORNEOL
12069328A	BORON CARBIDE
7631869B	CAB-O-SIL
62544A	CALCIUM ACETATE
12007566A	CALCIUM BORATE
4714341A	CALCIUM CARBONATE
10043524A	CALCIUM CHLORIDE
10035048A	CALCIUM CHLORIDE DIHYDRATE
62339B	CALCIUM DISODIUM EDTA
62339A	CALCIUM DISODIU VERSENATE
299285A	CALCIUM GLYCEROPHOSPHATE

10102688A	CALCIUM IODIDE
814802A	CALCIUM LACTATE
142176A	CALCIUM OLEATE
137086A	CALCIUM PANTOTHENATE
7789777A	CALCIUM PHOSPHATE, DIBASIC
7758238A	CALCIUM PHOSPHATE, MONOBASIC
7758874A	CALCIUM PHOSPHATE, TRIBASIC
7778189A	CALCIUM SULFATE
10101414A	CALCIUM SULFATE DIHYDATE
1333864A	CARBON DIOXIDE
409212A	CARBORUNDUM
37225266A	CARBOWAX
9004324C	CARBOXYMETHYL CELLULOSE
9004324A	CARBOXYMETHYL CELLULOSE, (Sodium Salt)
461052A	CARNITINE HYDROCHLORIDE
7235407	CAROTENE, TRANS-BETA-
UOFM1274A	CASEIN HYDROLYSATE
9005463A	CASEIN, SODIUM COMPLEX
68855549A	CELITE
9004324B	CELLEX
9004357A	CELLULOSE ACETATE
9004368A	CELLULOSE ACETATE BUTYRATE
UOFM1278A	CELLULOSE PHOSPHATE
9004346A	CELLULOSE POWDER
1306383A	CERIUM (IV) OXIDE
7647178A	CESIUM CHLORIDE
7440440C	CHARCOAL OR
16291966A	CHARCOAL, ANIMAL BONE
UOFM1146A	CHELATING AGENT
1406651A	CHLOROPHYL
604353A	CHOLESTERYL ACETATE
5808140A	CHOLIC ACID
62497A	CHOLINE
77929A	CITRIC ACID
68042B	CITRIC ACID TRISODIUM SALT DIHYDRATE
68647869A	COCOANUT CHARCOAL
8029434A	CORN SYRUP
9002602A	CORTICOTROPIN
60275A	CREATININE
68199A	CYANOCOBALAMINE
10016203A	CYCLODEXTRIN HYDRATE, ALPHA-
10016203B	CYCLOHEXAAMYLOSE
923320B	CYSTINE
923320A	CYSTINE, DL-
84526B	CYTIDINE-3-MONOPHOSPHATE
84526A	CYTIDYLIC ACID, 3-
71307A	CYTOSINE
UOFM1277A	DEAE CELLULOSE
9003989A	DEOXYRIBONUCLEASE
9011181A	DEXTRAN SULFATE
9004540A	DEXTRAN T 70
9004539A	DEXTRIN
492626B	DEXTROSE
68855549B	DIATOMACEOUS EARTH
7758794A	DISODIUM PHOSPHATE
3325006A	DL-ALPHA-GLYCEROPHOSPHATE

59927B	DOPA, L-
10034998B	EPSOM SALT
2338058A	FERRIC CITRATE
10045860A	FERRIC PHOSPHATE
9007732A	FERRITIN
299296A	FERROUS GLUCONATE
1345251A	FERROUS OXIDE
9001905A	FIBRINOLYSIN
9001336A	FICIN
61790532A	FILTER AGENT, CELITE
1343880A	FLORISIL
3385033A	FLUNISOLIDE HEMIHYDRATE
2321075A	FLUOROSCEIN
UOFM233A	FOOD FLAVORINGS AND OILS
26177855A	FRUCTOSE 1,6-DIPHOSPHATE DS SALT
57487A	FRUCTOSE, D-
643130A	FRUCTOSE-6-PHOSPHATE
8031183A	FULLER'S EARTH
59234A	GALACTOSE, D-(+)
526998B	GALACTRIC ACID
9000708A	GELATIN
77065A	GIBBERELIC ACID
9007834A	GLOBULIN, GAMMA-
299274B	GLUCONIC ACID, POTASSIUM SALT
604682A	GLUCOSE PENTAACETATE, ALPHA-D-
604693A	GLUCOSE PENTAACETATE, BETA-D-
492626A	GLUCOSE, ALPHA-D
50997A	GLUCOSE, D-(+)-
5996145A	GLUCOSE-1-PHOSPHATE, ALPHA
56860A	GLUTAMIC ACID, L-
56859A	GLUTAMINE, L-
110941A	GLUTARIC ACID
50812378A	GLUTATHIONE S-TRANSFERASE
819830A	GLYCEROL 2-PHOSPHATE, DISODIUM SALT HYDRATE
31566311A	GLYCERYL MONOSTEARATE
56406A	GLYCINE
9005792A	GLUCOGEN
556503A	GLYCYLGLYCINE
7782425A	GRAPHITE POWDER
73405A	GUANINE
118003A	GUANOSINE
9000015A	GUM ARABIC
9000059A	GUM BENZOIN
90000286A	GUM GHATTI
90000297A	GUM GUAIC
90000651A	GUM TRAGACANTH
10101414B	GYPSUM
9008020A	HEMOGLOBIN
9005496A	HEPARIN
51456A	HISTAMINE
56928A	HISTAMINE DIHYDROCHLORIDE
6341248A	HISTIDINE MONOHYDROCHLORIDE MONOHYDRATE
121346A	HYDROXY-3-METHOXYBENZOIC ACID
618279A	HYDROXY-L-PROLINE, CIS-4-
51354A	HYDROXY-L-PROLINE, TRANS-4-
9004620A	HYDROXYETHYL CELLULOSE

58639A	INOSINE, (-)-
87898A	INOSITOL
9005805A	INULIN
1637736A	ISOCITRIC ACID, TRISODIUM SALT HYDRATE, DL
73325A	ISOLEUCINE, L-
1332587A	KAOLIN
9008188A	KERATIN
UOFM160A	KODALITH DEVELOPER PART A
63423A	LACTOSE, BETA-D-
8006540A	LANOLIN, WOOL FAT
UOFM91A	LECITHIN
8002435A	LECITHIN
61905A	LEUCINE, L-
7447418A	LITHIUM CHLORIDE
1393926A	LITMUS BLUE
1393926 B	LITMUS, INDICATOR
9001632A	LUSOZYME
657272A	LYSINE MONOHYDRACHLORIDE, L-
56871A	LYSINE, L-
12650883A	LYSOZYME
142723A	MAGNESIUM ACETATE
546930B	MAGNESIUM CARBONATE BASIC
3409820A	MAGNESIUM CARBONATE, BASIC
7786303A	MAGNESIUM CHLORIDE
7757860A	MAGNESIUM PHOSPHATE TRIBASE
7487889A	MAGNESIUM SULFATE
10034998A	MAGNESIUM SULFATE HEPTAHYDRATE
9050366A	MALTODEXTRIN
6363537A	MALTOSE MONOHYDRATE, D-
69658A	MANNITOL, D-
59518A	METHIONINE, DL-
63683A	METHIONINE, L-
9004675A	METHYL CELLULOSE
15507763A	METHYL HISTIDINE, L-1-
111820A	METHYL LAURATE
368161A	METHYL-L-HISTIDINE
555306A	METHYLDOPA
617049A	METHYMANNOSIDE, ALPHA
526998A	MUCIC ACID
42200339A	NADOLOL
604591A	NAPHTHOFLAVONE, ALPHA
98920B	NIACINAMIDE
98920A	NICOTINAMIDE
53598A	NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE
59676A	NICOTINIC ACID
744044B	NORIT A, ACTIVATED CARBON
63428831A	NYLON
8049476A	PANCREATIN
9001734A	PAPAIN
9002646A	PARTHYROID HORMONE
9001756A	PEPSIN POWDER
UOFM77A	PETROLATUM
150301A	PHENYLALANINE, DL-
8002435B	PHOSPHATIDYL CHOLINE, L-ALPHA
9001905B	PLASMIN
9003490A	POLY(BUTYL ACRYLATE), LIQUID

25322683A	POLY(ETHYLENE GLYCOL), SOLID
9002884A	POLY(ETHYLENE), SOLID
9003274A	POLY(ISOBUTYLENE), SOLID
9003310A	POLY(ISOPRENE), SOLID
9011147A	POLY(METHYL METHACRYLATE)
25704181A	POLY(SODIUM 4-STYRENESULFONATE
9002895A	POLY(VINYL ALCOHOL), SOLID
9003332A	POLY(VINYL FORMAL), SOLID
9003398A	POLY(VINYL PYRROLIDONE), SOLID
9002817A	POLYACETYL, SOLID
9003014A	POLYACRYLIC ACID, SOLID
9003172A	POLYBUTADIENE, CIS-, SOLID
UOFM15A	POLYOLS AND POLYURETHANES
9003207A	POLYVINYL ACETATE, SOLID
127082A	POTASSIUM ACETATE
298146A	POTASSIUM BICARBONATE
1310618A	POTASSIUM BISULFITE
868144A	POTASSIUM BITARTRATE
584087A	POTASSIUM CARBONATE
7447407A	POTASSIUM CHLORIDE
866842A	POTASSIUM CITRATE
299274A	POTASSIUM FORMATE
868144B	POTASSIUM HYDROGEN TARTRATE
7681110A	POTASSIUM IODIDE
16788571A	POTASSIUM PHOSPHATE DIBASIC TRIHYDRATE
7778770A	POTASSIUM PHOSPHATE MONOBASIC, ANHYDROUS
7758114A	POTASSIUM PHOSPHATE, DIBASIC, ANHYDROUS
7778532A	POTASSIUM PHOSPHATE, TRIBASIC
7320345A	POTASSIUM PYROPHOSPHATE, TETRA
304596A	POTASSIUM SODIUM TARTRATE
7778805A	POTASSIUM SULFATE
12045782A	POTASSIUM TETRABORATE, TETRAHYDRATE
50865015A	PROTOPORPHYRIN IX, SODIUM SALT
83885B	RIBOFLAVIN
146178A	RIBOFLAVIN-5-PHOSPHATE
8050097A	ROSIN, POWDER
69727A	SALICYLIC ACID
11081406A	SEPHADEX G-15, FOR GEL FILTRATION
302841A	SERINE, DL-
56451A	SERINE, L-
7631869D	SILICA GEL
7699414A	SILICIC ACID
409212B	SILICON CARBIDE
7631869A	SILICON DIOXIDE
9016006A	SILICONE RUBBER, SOLID
127093A	SODIUM ACETATE
134032A	SODIUM ASCORBATE
144558A	SODIUM BICARBONATE
497198A	SODIUM CARBONATE
9038419A	SODIUM CELLULOSE PHOSPHATE
7647145A	SODIUM CHLORIDE
361091A	SODIUM CHOLATE
68042A	SODIUM CITRATE
7681825A	SODIUM IODIDE
13517061A	SODIUM IODIDE DIHYDRATE
10361032A	SODIUM METAPHOPHATE

143191A	SODIUM OLEATE
7558794A	SODIUM PHOSPHATE, DIBASIC, ANHYDROUS
10039324B	SODIUM PHOSPHATE DIBASIC DODECAHYDRATE
10049215A	SODIUM PHOSPHATE MONOBASIC MONOHYDRATE
10101890A	SODIUM PHOSPHATE TRIBASIC DODECAHYDRATE
10039324A	SODIUM PHOSPHATE, DIBASIC
7782856A	SODIUM PHOSPHATE, DIBASIC, HEPTAHYDRATE
7558807A	SODIUM PHOSPHATE, MONOBASIC, ANHYDROUS
50813166A	SODIUM POLYMETAPHOSPHATE
9080799A	SODIUM POLYSTYRENE SULFONATE
7782696A	SODIUM POTASSIUM PHOSPHATE
304596B	SODIUM POTASSIUM TARTRATE
7722885A	SODIUM PYROPHOSPHATE
1344098A	SODIUM SILICATE
868188A	SODIUM TARTRATE
14986846A	SODIUM TETRAPHOSPHATE
12034343A	SODIUM TITANATE
7785844A	SODIUM TRIMETAPHOSPHATE
13472452A	SODIUM TUNGSTATE
50704A	SORBITOL, D-
87796A	SORBOSE, L-(-)-
UOFM1123A	STAPHYLOCOCCAL ENTEROTOXIN
9005258A	STARCH, ELECTROPHORESIS
9005849A	STARCH, SOLUBLE
9001621A	STEAPSIN
1633052A	STRONTIUM CARBONATE
57501A	SUCROSE
2447576A	SULFADOXINE
12070063A	TANTALUM CARBIDE
87694A	TARTARIC ACID, L(+)-
67038A	THIAMINE HYDROCHLORIDE
80682A	THREONINE, DL-
72195A	THREONINE, L-
9005849B	THYODENE
13463677A	TITANIUM DIOXIDE
7758874C	TRICALCIUM PHOSPHATE
7601549A	TRISODIUM PHOSPHATE, INDICATOR
9002077A	TRYPSIN
51672C	TYROSINE, D-
556025A	TYROSINE, DL-
60184A	TYROSINE, L-
9002124A	URICASE
58968A	URIDINE
72184A	VALINE, L-
121346B	VANILLIC ACID
121335A	VANILLIN
68199B	VITAMIN B12
83885A	VITAMIN B2
7695912B	VITAMIN E
59029B	VITAMIN E
83705A	VITAMIN K-5
69896A	XANTHINE
9010666A	ZEIN
7779900A	ZINC PHOSPHATE

APPENDIX F - SUBPART K LABORATORY MANAGEMENT PLAN REQUIREMENTS PER AR APC-EC §262.214

Per AR APC-EC §262.214, an eligible academic entity must develop and retain a written Laboratory Management Plan or revise an existing written plan that addresses the elements listed in the table below.

APC&EC numbers	Regulation Language	Associated section(s) in this plan
Laboratory Management Plan Part I Requirements		
262.214 (a)(1)(i)	Describe procedures for container labeling in accordance with §262.206(a), including: (i) Identifying whether the eligible academic entity will use the term “unwanted material” on the containers in the laboratory. If not, identify an equally effective term that will be used in lieu of “unwanted material” and consistently by the eligible academic entity. The equally effective term, if used, has the same meaning and is subject to the same requirements as “unwanted material.”	Section 10.2.3
262.214 (a)(1)(ii)	Describe procedures for container labeling in accordance with §262.206(a), including: (ii) Identifying the manner in which information that is “associated with the container” will be imparted.	Section 10.2.3
262.214 (a)(2)(i)	Identify whether the eligible academic entity will comply with §262.208(a)(1) or (a)(2) for regularly scheduled removals of unwanted material from the laboratory.	Section 10.2.4
Laboratory Management Plan Part II Best Management Practices		
262.214 (b)(1)	Describe its intended best practices for container labeling and management, (see the required standards at §262.206).	Section 10.0
262.214 (b)(2)	Describe its intended best practices for providing training for laboratory workers and students commensurate with their duties (see the required standards at §262.207(a)).	Section 13.0
262.214 (b)(3)	Describe its intended best practices for providing training to ensure safe on-site transfers of unwanted material and hazardous waste by trained professionals (see the required standards at §262.207(d)(1)).	Section 10.2.4.2
262.214 (b)(4)(i)	Describe its intended best practices for removing unwanted material from the laboratory, including: (i) For regularly scheduled removals—Develop a regular schedule for identifying and removing unwanted materials from its laboratories (see the required standards at §262.208(a)(1) and (a)(2)).	Section 10.2.4
262.214 (b)(4)(ii)	Describe its intended best practices for removing unwanted material from the laboratory, including: (ii) For removals when maximum volumes are exceeded: (A) Describe its intended best practices for removing unwanted materials from the laboratory within 10 calendar days when unwanted materials have exceeded their maximum volumes (see the required standards at §262.208(d)). (B) Describe its intended best practices for communicating that unwanted materials have exceeded their maximum volumes.	Section 10.2.4.1 Section 10.2.4.2
262.214 (b)(5)	Describe its intended best practices for making hazardous waste determinations, including specifying the duties of the individuals involved in the process (see the required standards at §262.11(a) through (d) and §§262.209 through 262.212).	Section 7.6 -7.8 Section 9.0
262.214 (b)(6)(i)	Describe its intended best practices for laboratory clean-outs, if the eligible academic entity plans to use the incentives for laboratory clean-outs provided in §262.213, including: (i) Procedures for conducting laboratory clean-outs (see the required standards at §262.213(a)(1) through (3	Section 10.5

262.214 (b)(6)(ii)	Describe its intended best practices for laboratory clean-outs, if the eligible academic entity plans to use the incentives for laboratory clean-outs provided in §262.213, including: (ii) Procedures for documenting laboratory clean-outs (see the required standards at §262.213(a)(4)).	Section 10.5
262.214 (b)(7)(i)	Describe its intended best practices for emergency prevention, including: (i) Procedures for emergency prevention, notification, and response, appropriate to the hazards in the laboratory.	Section 14.0 Section 15.0
262.214 (b)(7)(ii)	Describe its intended best practices for emergency prevention, including: (ii) A list of chemicals that the eligible academic entity has, or is likely to have, that become more dangerous when they exceed their expiration date and/or as they degrade.	Section 9.2
262.214 (b)(7)(iii)	Describe its intended best practices for emergency prevention, including: (iii) Procedures to safely dispose of chemicals that become more dangerous when they exceed their expiration date and/or as they degrade.	Section 9.2 Section 11.1
262.214 (b)(7)(iv)	Describe its intended best practices for emergency prevention, including: (iv) Procedures for the timely characterization of unknown chemicals.	Section 10.3
262.214 (c)	An eligible academic entity must make its Laboratory Management Plan available to laboratory workers, students, or any others at the eligible academic entity who request it.	Section 2.0
262.214 (d)	An eligible academic entity must review and revise its Laboratory Management Plan, as needed.	Section 4.0