1. Purpose

University of Alaska Anchorage (UAA) employees, student workers, faculty, staff, and outside contractors who handle waste materials in the course of their work functions, may create certain wastes which require special disposal. Wastes are materials that cannot be sold or recycled, or are intended to be abandoned or discarded. The hazards and regulatory implications associated with improper handling and management of wastes can be substantially reduced by following the federal and state regulations outlined in this program. This program for Waste Management is intended to ensure workers are knowledgeable in the proper procedures for handling wastes and the steps to be taken to protect themselves and others.

2. Objective

UAA, in its continuing effort to provide employees with safe, healthful working conditions, and to comply with the Occupational Safety and Health Act as well as federal and state regulations is implementing the following program for waste to protect people working at the University, by helping employees, student workers, faculty, staff, and outside contractors better understand waste management.

3. Scope

This program applies to UAA employees, student employees, faculty, staff, and outside contractors working on campus.

4. Definitions

Aqueous Waste - aqueous waste is defined as a waste that is water-based

Very Small Quantity Generator (VSQG) - a business or entity that generates no more than 220 lbs (100 kg) of hazardous waste per month

Controlled Substances - a drug or chemical whose manufacture, possession, or use is regulated by a government, such as illicitly used drugs or prescription medications that are designated by law

Corrosive Waste - anything liquid with a pH of less than or equal to 2 or greater than or equal to 12.5, or can corrode steel

Empty - the EPA considers a container "empty" for hazardous waste containers or liners if:

- All waste has been removed that can be removed by pouring, pumping, or by means of suction; *and*
- No more than 1 inch (in.), equivalent to 2.5 centimeters, of residue remains on the bottom of the container or inner liner (commonly referred to as the "one-inch rule"); or

- No more than 3 percent by weight of total capacity of the container remains in the container or inner liner if container is less than or equal to 119 gallons (gal) in size; or
- No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gal in size

A container used to hold an acute hazardous waste that is listed in 40 CFR 261.31 and 40 CFR 261.33(e) is empty if one of these three conditions has been met:

- It has been triple-rinsed using a solvent capable of removing the hazardous waste
- It has been cleaned by another method that has been shown to achieve the equivalent removal of triple-rinse
- In the case of a container, the inner liner that prevented contact of the hazardous waste has been removed

Episodic Event - any circumstance, planned or unplanned, that does not occur as part of normal operations and causes a VSQG or SQG to exceed their monthly hazardous waste generation limit. The EPA has established a special set of regulations for episodic events that allows facilities to maintain their current generator status if an episodic event occurs

Flammable Waste - a waste material that exhibits one of the following:

- Liquids with a flash point **(**the lowest temperature at which fumes above waste ignite) of 60 degrees Celsius or 140 degrees Fahrenheit. Examples include alcohol, gasoline, and acetone
- Solids that spontaneously combust
- Oxidizers and compressed gasses

Halogenated Materials - chemical compound or mixture that contains halogen atoms, i.e. fluorine, chlorine, bromine, or iodine. Bonding to carbon the halogens form a class of compounds call covalent halides, i.e. they are not electrolytic in nature

Hazardous Materials - any material or substance which if improperly handled, can be damaging to personal health and the environment. Hazards associated with a material may be determined by reviewing the Safety Data Sheets (SDS), the product label, or the shipping papers. Federal and State regulations determine if a material is hazardous through specific listings and definitions addressed in EPA regulation 40 CFR 261 and CDPHE regulation 6 CCR 1007-3, Part 261. The final tool in determining if a material is hazardous is personal knowledge; an individual may have created the materials or have specific information about the material's ingredients

Hazardous Waste - simply defined, a hazardous waste is a waste with properties that make it

dangerous or capable of having a harmful effect on human health or the environment. A hazardous waste is a special type of waste because it cannot be disposed of by common means like other commonly produced by-products or non-hazardous wastes

Infectious Material - any of the following three items:

- The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids
- Any unfixed tissue or organ (other than intact skin) from a human (living or dead)
- HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV

Lamp - the bulb or tube portion of an electric lighting device

Mixed Waste - when a listed hazardous waste is mixed with any other waste, the entire mixture becomes a hazardous waste

Oxidizer - a substance that has the ability to oxidize, or cause another to lose electrons

P-Listed Waste - discarded commercial chemical products, manufacturing chemical intermediates, and off-specification commercial chemical products that contain certain ingredients, and any soil or debris contaminated by spills of those products or intermediates The P-list can be found at 40 CFR section 261.33

Radioactive Waste - a material that emits or is capable of emitting, radiant energy in the form of particles or rays, as alpha, beta, and gamma rays, by the spontaneous disintegration of atomic nuclei. said of certain elements

Reactive Waste - the EPA recognizes that there are too many conditions and situations to identify all types of reactive wastes. However, they use the following as guidelines to assist generators:

- Unstable, and routinely experiences violent change without detonating
- Potential for explosive mixture or violent reaction when combined with water
- Toxic gasses are released when mixed with water

Resource Conservation and Recovery Act (RCRA) - law that creates the framework for the proper management of hazardous and non-hazardous solid waste. The law describes the waste management program that gave EPA authority to develop the RCRA program

Safety Data Sheet (SDS) - a detailed informational document prepared by the manufacturer or importer of a chemical. The intent of the SDS is to communicate chemical information to downstream transporters and users of the material. The SDS includes information such as physical properties, health and environmental hazards, protective measures, and precautions for handling, storage and transportation.

Sharps - medical term for devices with sharp points or edges that can puncture or cut skin

Solid Waste - any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, resulting from industrial, commercial, mining, and agricultural operations, and from community activities. Nearly everything we do leaves behind some kind of waste. The EPA definition of solid waste is not limited to wastes that are physically solid. Many solid wastes are liquid, semi-solid, or contain gaseous material. A solid waste is any material that is discarded by being abandoned, inherently waste-like, or recycled in certain ways

Toxic Waste - poisonous materials that pose a threat to groundwater, which can have long term effects to human health and the environment. This is different from the first three characteristic groups, which the EPA views as containing immediate and firsthand dangers. There are 60 contaminants on the toxicity characteristics list. These contaminants are identified solely through a test method called Toxicity Characteristic Leaching Procedure or TCLP

Waste - materials that cannot be recycled or used by someone else, or are intended to be abandoned, discarded or is inherently waste-like.

- If the material can be recycled or used by someone else, it is NOT waste.
- If the material is intended to be discarded, abandoned, or is inherently waste-like, it IS waste.
- The EPA views old chemicals that have not been used in years and which are unlikely to be used in the foreseeable future as waste (orphans).

Waste Generator - any person or entity that produces a waste that is listed in the hazardous waste regulations.

Waste Generator Classification - there are different levels of regulation for facilities that generate different volumes of hazardous waste (HW) monthly. The regulations are based on the three categories of Generators:

- Very Small Quantity Generators (VSQG)
- Small quantity generators (SQGs)
- Large quantity generators (LQGs)

5. Authority and Responsibilities

In addition to the roles and responsibilities outlined in the UAA Training Program, the following apply to the Waste program.

EHS/RM

- Develop the Waste program and assist departments with compliant procedures
- Work with departments to assist with proper classification and management of hazardous wastes including safe storage, inventory management, Personal Protective Equipment (PPE) selection, and waste disposal methods
- Develop content and provide hazardous waste training upon request

Supervisor/ Principle Investigators / Research Lab Supervisors / Department Lab Coordinators

- Identify potential waste streams prior to bringing in chemicals or products
- EHS/RM can provide guidance on disposition of the waste produced, and expected costs the department may incur for disposal of wastes requiring special handling including hazardous wastes
- Report all waste shipments to EHS/RM CHO prior to setting up for disposal
- Ensure all waste manifests and tracking paperwork is sent to ESH/RM CHO
- Ensure chemicals in the department are properly handled, and any wastes are properly stored and set up for disposal
- Conduct periodic inspections of wastes in their department to ensure compliance with this program
- Ensure employees are properly trained in this Waste Program and the proper handling of wastes in their work areas
- Complete waste summarization flow chart for all research projects and teaching labs
- Update waste flow charts when new chemicals are used, or the lab protocol changes resulting in new waste streams
- Ensure the proper PPE is made available to personnel in their department for work with hazardous wastes
- Conduct periodic observations of hazardous waste handling in their department to verify required procedures are followed
- Ensure hazardous waste spills and releases are properly cleaned and reported to EHS/RM

Chemical Hygiene Officer (CHO)

- Assist departments who use hazardous chemicals to ensure they are used in a safe manner as well as in compliance with all applicable regulations
- Work with Principle Investigators, Supervisors, and other lab personnel to develop, review and approve chemical handling procedures involving hazardous materials and waste
- Provide guidance on personal protection equipment selection and use involving hazardous materials
- Profile and arrange disposal of all hazardous wastes leaving UAA campus unless other procedures have been established and approved by EHS/RM

Department Safety Coordinator

- Assist in the determination of waste streams
- Conduct periodic inspections of wastes in the department to ensure proper storage, labeling and management
- Assist in the determination of safe methods avoid creating waste streams, or minimize the amount of waste produced

Employees/Student Workers

- Understand the hazards of all chemicals in their work area by reading all pertinent Safety Data Sheets (SDS)
- Identify and label all waste containers accurately immediately once chemicals are placed in them
- Contact supervisor for assistance with questions on waste handling or disposal
- Communicate when new or unexpected waste streams are created
- Never dispose of hazardous materials down drains or general waste containers without prior approval

Outside Contractors

- Perform all work in compliance with their company's hazardous waste program, which will be reviewed and approved by the EHS/RM department
- Plan for disposal of any wastes generated on site, and never leave wastes to be disposed of by UAA
- If the company does not have a program, they must comply with this program

6. Hazards Associated with Hazardous Waste

The following hazards associated with hazardous waste can lead to personal injury, death and fines by regulatory agencies:

- Spills of unknown waste materials
- Fires or explosions from mismanagement of waste streams
- Aged inventory resulting in chemical reaction
- Personnel unaware of the hazards of chemicals in use
- Employee exposure to harmful chemicals
- Equipment damage from chemical exposure
- Misidentification and misuse of chemicals, causing chemical exposure, injury or fire
- Impact to the environment when hazardous materials are not deposed of properly

7. Engineering Controls

Engineering controls are design plans or changes to the working environment to prevent or reduce employee exposure to hazardous wastes and simplify compliance with waste management regulations. The following example of engineering controls should be considered in area design to reduce the risks associated with hazardous wastes.

- Designated storage areas, chemical cabinets, and containers for proper storage of hazardous materials
- Ensure equipment and containers are made of materials compatible with waste streams
- Accessibility of proper handling tools and equipment to be used in place of PPE
- Utilization of electronic chemical tracking software to assist in tracking hazardous material use

8. Administrative Controls

Administrative controls are safe work practices and procedures designed to reduce the risks associated with waste management. Examples of administrative controls include the following:

- Train employees who work with hazardous waste
- Routine inspections of chemical use to ensure proper management of wastes
- Plan jobs, research and experiments involving hazardous waste and conduct pre-work briefings

- Ensure proper storage containers and areas are available to personnel who handle wastes
- Provide employees with the proper PPE to use while handling hazardous wastes

9. Procedures

All UAA personnel should adhere to the following procedures to ensure compliance with all waste regulations and protect employees and the environment.

Waste Minimization

The primary goal of waste management is to reduce the amount of all types of waste produced. This can be achieved by the following:

Reduce:

Always limit the waste created by making efforts to reduce the use of materials we know will end up as waste. Personnel can make reductions in many ways including the following:

Make every effort to carefully plan work and only purchase what you need of any item. Only order what you know you are going to use to avoid surplus supplies.

Be aware of wastes produced as a result of a job being performed and make an effort to minimize that when possible

Purchase durable goods in place of disposable if feasible for the task being performed

Reuse:

An effective way to reduce waste is to find other users or purpose for materials that are no longer needed. UAA General Support Services can assist with reallocation of UAA owned property. Options for reuse include:

- Check the UAA Surplus web page for contacts and support
- When possible check if your waste can be of use in another group or department
- Is there a market where UAA may be able to sell the materials
- Can the materials be donated to a charity, etc.
- Reuse a product as many times as possible, or feasible

Recycle:

UAA has many recycling efforts and programs for many common waste materials including mixed paper and cardboard, cans, and certain plastic products. Check with UAA general support services for general rubbish recycle programs. Prior to recycling any hazardous materials contact EHS/RM CHO for notification and assistance.

Municipal Solid Waste

General trash or garbage consisting of everyday items that are discarded by the public and generally disposed of in a municipal landfill is managed by UAA Maintenance and Operations Custodial Services. Any material placed in municipal solid trash cans or dumpsters may not pose a hazard to human health or the environment. If there is a question on whether or not a material can be placed in the general municipal waste collection contact janitorial services or EHS/RM for assistance.

Aqueous Waste

For sewer disposal, aqueous waste must meet all of the following requirements:

- Not have any characteristics listed in the Special Properties or Characteristic Waste sections below
- pH greater than 6 and less than 8
- Have no insoluble solids

Universal Waste

EPA's universal waste regulations streamline the hazardous waste management standards for certain categories of hazardous waste that are commonly generated by a wide variety of establishments. The universal waste program promotes the collection and recycling of certain widely generated hazardous wastes, known as universal wastes.

There are currently four types of universal waste including:

- Batteries
- Pesticides
- Mercury-Containing Equipment
- Lamps (bulbs)

In general, materials managed as universal waste can be stored for a year and are not required to be shipped with a manifest. In addition, universal wastes do not need to be counted toward a generator's category for the purpose of determining whether it is a very small quantity generator, small quantity generator, or large quantity generator. The universal waste regulations do require that the materials be managed in a way to prevent releases to the environment and tailors those requirements to each type of universal waste as follows:

Batteries:

Batteries stored and sent out for recycling do not fall under the universal waste rules and therefore do not require labeling or storage time limits.

General Support Services (GSS) maintains the UAA Recycling program. Batteries must have the anodes taped, be collected in a box or bag labeled "Recycle" and placed directly next to the paper or mixed recycling bin in the department for pick up by the recycling team. Visit GSS's Recycling page for details.

GSS recycles the following types of batteries:

- Alkaline
- Lithium
- Lithium-ion (rechargeable)
- Nickel metal hydride
- Nickel cadmium/ "wet cell"
- Nickel cadmium/ "dry cell"
- Lantern-type 6-volt batteries
- Lead-acid batteries

Non-recycled Battery Storage and Handling

Containers:

- Small batteries should have the anodes covered by placing in a bag or taping
- Structurally sound, rigid container
- Large batteries do not need to be placed in a container but then must have a separate label

Labeling and Marking:

- Containers or individual batteries must have a "Universal Waste-Battery" label
- Mark on the label the date the first battery is placed in the container.

Storage:

- Small batteries must be placed inside containers.
- Containers must be kept closed at all times, except when adding batteries to container.

Disposal:

- Containers of batteries must not be stored for longer than 11 months
- Contact EHS/RM for pickup not more than 11 months after the date the first battery is

placed in the container, whether the container is full or not

- For individual batteries, contact EHS/RM for pickup not more than 11 months after the battery is labeled and dated
- EHS/RM will pick up batteries/containers of batteries for disposal.

Broken/Leaking Batteries:

- Clean up broken/leaking batteries immediately
- Place into a separate container from non-broken/non-leaking batteries
- Parts and residues of broken/leaking batteries become hazardous waste
- Label containers with hazardous waste labels supplied by EHS/RM
- Contact EHS/RM for disposal.

Mercury Containing Equipment

A device or part of a device (excluding batteries and lamps) that contains elemental mercury integral to its function. This does not include cathode ray tubes nor mercury waste generated as a by-product. Examples of mercury containing equipment are:

- Thermometers
- Manometers
- Barometers
- Relay switches
- Mercury reg. meters
- Pressure gauges
- Sprinkler system contacts

Containers:

- 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.
- Place bags into a structurally sound, rigid container such as a cardboard box.
- Container must be capable of being closed so that no material can fall out.
- Contact EHS for assistance with selection of containers.

Labeling and Marking:

- Attach a "Universal Waste-Mercury Containing Equipment" label to the container.
- Mark on the label the date the first piece of equipment is placed in the container.
- Mark on the label the name of the building where the equipment container is stored.
- Contact EHS/RM to obtain labels.

Storage:

- Containers must be kept closed at all times when not in use.
- When appropriate use secondary containment to prevent spills.

Disposal:

- Containers of equipment must not be stored for longer than 11 months.
- Contact EHS/RM for pickup not more than 11 months after the date the first piece of equipment is placed in the container, whether the container is full or not.
- EHS/RM will arrange pick up mercury containing equipment for disposal.

Mercury Spills/Leaking Equipment:

- Clean up mercury spills immediately.
- Contact EHS/RM for questions on spill clean up.
- Place mercury contaminated material into a separate container from non-broken/non-leaking equipment.
- Spill residues are also hazardous waste.
- Label containers with hazardous waste labels supplied by EHS/RM.
- Contact EHS/RM for disposal.

Lamps (Bulbs):

Lamps are the bulb or tube portion of an electric lighting device and include fluorescent, high intensity discharge neon mercury vapor high pressure sodium, and Metal halide lamps

Containers:

- Bulbs should be stored securely in a structurally sound and rigid, box or drum that can be properly closed prevent lamps from falling out and breaking
- Contact janitorial services for used lamp storage boxes

Labeling and Marking:

- Boxes storing used lamps must have a "Universal Waste-Lamps" label affixed to the container.
- Mark on the label the date the first lamp is placed in the container.
- Prior to disposal mark the label with the final lamp count.

Storage:

- Lamps must be placed inside containers.
- All containers must be kept closed at all times, except when adding lamps. Use tape to hold box flaps shut to prevent breakage. New lamp boxes should also be taped shut.

Disposal:

- Containers of lamps must not be stored for longer than 11 months.
- Contact EHS/RM for pickup not more than 11 months after the date the first lamp is placed in the container regardless of the number of lamps in the container
- UAA Maintenance and Operations will pick up containers of lamps for disposal.

Broken Lamps:

- Clean up broken lamps immediately.
- Place broken lamp, and broken lamp parts into a lamp container.

Pesticides

The universal waste regulations can be used to manage pesticides that have been recalled if they are either stocks of a suspended and canceled pesticide that are part of a voluntary or mandatory recall under FIFRA Section 19(b) (including, but not limited to those owned by the registrant responsible for conducting the recall) or if they are stocks of a suspended or canceled pesticide, or a pesticide that is not in compliance with FIFRA, that are part of a voluntary recall by the registrant. Universal waste can also be used to manage stocks of other unused pesticide products that are collected and managed as part of a waste pesticide collection program.

Please contact EHS/RM for disposal requirements for any pesticide

Containers:

- Containers must be sealable preventing contents from spilling or leaking
- Containers must be compatible with the contents
- Contact EHS for assistance with selection of containers

Labeling and Marking:

- Attach a "Universal Waste-Pesticide" label to the container
- Mark on the label the date the first piece of equipment is placed in the container
- Contact EHS/RM to obtain labels.

Storage:

- Containers must be kept closed at all times when not in use
- When appropriate use secondary containment to prevent spills

Disposal:

- Containers of pesticide must not be stored for longer than 11 months
- Contact EHS/RM for pickup not more than 11 months after the date pesticide is placed in the container, whether the container is full or not.
- EHS/RM will arrange pick up of pesticide for disposal.

Pesticide Spills/Leaking Equipment:

- Clean up small spills or drips immediately.
- Contact EHS/RM for questions on spill clean up.
- Place pesticide contaminated material into a separate container from non-broken/non-leaking equipment.
- Spill residues may also be hazardous waste.
- Label containers with hazardous waste labels supplied by EHS/RM.
- Contact EHS/RM for disposal.

Electronics

Computers & All Electronics Containing Hard Drives (multifunction devices, scanners, fax machines, etc.)

These items will be picked up by UAA Surplus for reallocation, sale, or recycling. UAA Electronics Surplus form is required from the department and recycling surcharges apply. In accordance with University of Alaska requirements, UAA has procedures related to the disposal of hard drives that includes the secure removal of data. With the exception of leased equipment, all devices containing hard drives should be disposed of through Surplus, where all such devices are to be secured until processing to erase all data from the drive(s). Devices with hard drives may NOT be sold, auctioned, or sent to electronics recycling before processing through Surplus without

prior written authorization and an alternative acceptable method of hard drive erasure/removal approved.

Other Electronics – not computers, not containing hard drives These items will be picked up by UAA Surplus for reallocation, sale, or recycling. UAA Electronics Surplus form is required from the disposing department and recycling surcharges apply.

Cathode Ray Tubes (CRT) (Tube Type Televisions or Monitors)

Due to the presence of lead located in the funnel glass, CRTs marked for disposal are considered hazardous waste under RCRA. However, CRT glass and used CRTs that are recycled or exported for recycling are not considered solid or hazardous waste under RCRA if certain conditions are met.

There are restrictions on the export of CRTs, therefore contact EHS/RM for assistance in ensuring qualified venders are used when sending out CRTs.

Polychlorinated Biphenyls (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until manufacturing was banned in 1979. Studies in humans support evidence for potential carcinogenic and non-carcinogenic effects. Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include:

- Transformers and capacitors
- Electrical equipment including voltage regulators, switches, re-closers, bushings, and electromagnets
- Old electrical devices or appliances containing PCB capacitors
- Fluorescent light ballasts

Contact EHS/RM for assistance disposing of any PCB containing materials.

Aerosol Cans

Aerosol cans contain a product and propellant under pressure Often aerosol cans contain hazardous materials, and as a result are considered hazardous waste if not completely empty.

Aerosol cans which are completely empty (i.e. no product or propellant remains in can) may be disposed of in the trash.

Containers:

- Containers must be sealable preventing contents from spilling or leaking

- Containers must be compatible with the contents
- Contact EHS for assistance with selection of containers

Labeling and Marking:

- Attach a "Hazardous Waste Aerosol Cans" label to the container
- Mark on the label the date the first aerosol can is placed in the container
- Contact EHS/RM to obtain labels

Storage:

- Personnel should remove spray tips prior to disposal to avoid inadvertent discharge in the disposal drum
- Containers must be kept closed at all times when not in use
- When appropriate use secondary containment to prevent spills

Disposal:

- Contact EHS/RM for pickup
- EHS/RM will arrange pick up for disposal

Aerosol Can Waste Spills/Leaking:

- Clean up small spills or drips immediately.
- Contact EHS/RM for questions on spill clean up.
- Spill residues may also be hazardous waste.
- Label containers with hazardous waste labels supplied by EHS/RM.
- Contact EHS/RM for disposal.

Water-Based or Latex Paint Disposal

Latex-based paints are not hazardous waste; however, liquid latex paint may not be disposed of in dumpsters, trash cans or storm drains. If the paint in the can is completely dry, it may be disposed of in the trash.

Water based, or latex paint may be disposed of in several ways and is presented here in order of preference:

1. Use the paint for University jobs
2. Donate any surplus paint to community service projects

3. Solidify the paint by mixing with oil dry, granulated clay. After completely dry, dispose of as regular trash.
4. Contact EHS/RM to take the paint to a municipal solid waste service depot for disposal

Petroleum-Based or Oil Paint

Petroleum or Oil based paints are regulated hazardous waste and restrictions apply. Departments are encouraged to use only water-based paints whenever possible and only order sufficient quantities to meet job needs for both forms of paint. This paint may be disposed of in several ways and is presented in order of preference:

- Use the paint for University jobs
- Donate any surplus paint to community service projects
- Contact EHS/RM for disposal

Solvents used for cleaning or prepping petroleum-base paint activities are also regulated as hazardous waste. Methods to manage this waste stream are, in order of preference

- Limit the use of petroleum-based paints and solvents.
- Contact EHS/RM for disposal.

Compressed Gas Cylinders

Compressed gas containers include refillable and non-refillable cylinders

Refillable cylinders are to be returned to the compressed gas vendor when empty

Non-refillable cylinders (lecture bottles, nominal 1-pound LPG canisters) must be further characterized by what it contained and how much remains.

If the contents of the non-refillable cylinder or aerosol can are NOT hazardous, AND the container has been emptied to atmospheric pressure, the container can be disposed in regular trash.

If the contents are hazardous, regardless of how empty, the container is hazardous waste. Contact EHS/RM for assistance with storage and disposal of these cylinders.

Animal Parts or Carcasses

Unpreserved tissues and parts of animals or animal carcasses are considered potentially infectious material and must be collected for incineration. The cost of incinerating animal carcasses or other animal tissue used in any instructional or research lab will be the responsibility of the department.

Preserved animal specimens used in instructional courses such as Anatomy & Physiology that have been fixed and stored in solution such as Carolina's Perfect Solution are not potentially infectious materials and can be disposed in regular trash. These shall be drained of preserving solution, placed

in plastic bags, then in a box and sealed with strong tape before transport directly into a dumpster.

Antifreeze, Coolant, or Oil

All used antifreeze, coolant, motor, or lubricating oils and other engine fluids are hazardous to the environment and will be collected for disposal or recycling by a EHS/RM approved vendor.

Each type of fluid must be collected separately – do not mix the waste streams.

No antifreeze or food grade propylene glycol is to be discharged to any sewer or sink drain without lab testing for specific metals and authorization of disposal by Anchorage Water and Wastewater Utility (AWWU) after receipt of the associated lab results.

Controlled Substances or Drugs

Antibiotics, OTC drugs, prescription drugs, and DEA listed controlled substances all need to be collected for proper disposal.

The licensed user will be responsible for meeting all of the requirements for the transfer or disposal of all compounds or materials that fall into the classification of a DRUG or other CONTROLLED SUBSTANCE listed on the DEA schedules. Assistance can be arranged by calling EHS/RM CHO. Anyone that does not comply with the DEA requirements may subject themselves and the University to civil and criminal action.

Radioactive Waste

Materials with the radiation warning symbol, thorium and uranium compounds, RIA kits, smoke detectors, self-illuminating exit signs, and sealed sources are examples of radioactive waste. These materials required special handling for disposal. Please consult the Radioactive Waste Safety Manual and contact the UAA Radiation Safety Officer for disposal assistance.

Sharps and Infectious Waste

Razor blades, syringes, needles and the like are sharps and must be collected in a sharps container for disposal. Sharps may or may not also be considered pathogenic or infectious. If the sharps may be infectious, the container and its contents must be autoclaved prior to calling for medical waste disposal.

Metals

Scrap metal should be recycled, whenever feasible.

Ferrous metals such as iron and steel may be disposed in regular trash.

Hazardous Waste Standard Operating Procedures (SOPs)

Written waste SOPs are the responsibilities of the departments generating the hazardous waste. These SOPs should contain the following information shown below and be vetted through

EHS/RM for approval and to ensure regulatory compliance with regard to UAA's current waste generator classification and other agency/ regulatory requirements. A SOP template is located in Appendix A.

- Identity and characteristic(s) of waste
- Volume of waste generated per semester
- Generating department or laboratory PI

Generator Status

EPA and the Alaska Department of Environmental Conservation (DEC) regulations identify:

- "Cradle to grave" responsibilities for generator of hazardous waste.
- Criteria for the identification and listing of hazardous wastes.
- Enforceable standards applicable to hazardous waste generators, transporters, and treatment, storage, and disposal facilities.

Based upon the volume and type of wastes generated, hazardous waste generators are classified into three categories, each category has an increasing amount of regulatory requirements and cost associated with it. The three categories are as follows:

- Very Small Quantity Generators (VSQG)
- Small Quantity Generators (SQG)
- Large Quantity Generators (LQG)

A generator is a Very Small Quantity Generator if the facility generates no more than 100 kg of RCRA hazardous waste or 1 kg of acutely hazardous waste (P-listed waste) in a calendar month.

Wastes accumulated on-site SHOULD NEVER be allowed to exceed 1000 kg (2,200 pounds) of RCRA-regulated hazardous waste or 1 kg (2.2 lbs.) of acutely hazardous waste.

UAA is currently classified as a Very Small Quantity Generator. Is it extremely important to communicate all hazardous waste generation with EHS/RM to ensure waste streams are tracked and managed correctly to better maintain generator status or change status if required.

Episodic Event

When a non-routine event occurs resulting in a VSQG or SQG generating an atypical amount of hazardous waste, the generator has an 'episodic event'.

A generator may have one episodic event per calendar year. Examples of conditions that would trigger an episodic event are:

- Tank cleanouts
- Removing excess or aged inventory
- Product recalls
- Accidental spills (tankers, tractor trailers, etc.)
- Acts of nature (earthquakes, floods, etc.)

There are specific conditions and requirements for disposing of waste generated by an episodic event. Consult the EHS/RM Chemical Hygiene Officer for any questions regarding hazardous materials disposal.

Waste Disposal Cost

Any waste requiring disposal by a designated facility for hazardous waste treatment, storage, or disposal (not a local landfill) will be arranged through a hazardous waste management company, approved by EHS/RM, and the associated costs passed on to the department, college, or person(s) responsible for the generation of such waste. This includes acutely hazardous waste (P-listed compounds or waste containing P-listed compounds).

Any waste requiring incineration will be arranged through a company approved by EHS/RM and the associated costs passed on to the department, college, or the person(s) responsible for the generation of such waste.

General Hazardous Waste Guidelines

Any questions or concerns on the proper disposal of waste may be directed to the UAA CHO

Containers used for collection of waste must be constructed of material compatible with the intended contents and must not leak or otherwise allow the contents to escape when sealed.

Mixed Waste (to be avoided)

If mixed wastes are produced, the separation of mixed wastes must be included as one of the final steps of that procedure. In many cases mixed waste cannot be accepted for disposal. In cases where it can be disposed, UAA will realize a significant cost increase.

- Organic and aqueous waste mixtures
- Liquid and solid waste mixtures
- Halogenated and non-halogenated organic waste

Organic and aqueous layers must be separated, put in an appropriate container, and properly disposed. Liquid and solids must also be separated and placed in appropriate containers for proper disposal.

Organic solvents are always hazardous waste that must be collected. If any halogenated solvent is included, the entire contents of that waste container is considered halogenated waste. Contact the EHS/RM CHO for assistance if needed.

Empty Chemical Containers

Unlike the hazardous waste regulations, a container is generally considered empty if its contents have been removed by commonly employed practices such as pouring, pumping, or aspirating, and no more than one inch or one percent of residue remains on the bottom of the container (whichever is the lesser amount). Although these regulations allow for some residuals for certain materials, UAA personnel will endeavor to remove as much residuals as possible and go beyond these requirements. This includes airing out empty solvent containers in chemical hoods and scraping the bottom of bottles containing solids. Containers that held acutely hazardous chemicals must be triple rinsed to be considered empty. Containers that are triple rinsed must have the rinse material collected and disposed of as hazardous waste. The amount of rinsate must be minimized to reduce the amount of waste produced.

Empty chemical containers that contained Extremely Hazardous Substances or a substance with an LD_{50} of less than 50 mg/kg are considered hazardous waste and should not be disposed of via normal trash.

All barcode labels associated with any chemical in the chemical inventory should be removed and turned into the stockroom manager prior to disposal of any empty container.

Unknown Waste

Unknown waste must be characterized for proper disposal. Characterization may be based on knowledge of the process producing the waste, or the waste must be analyzed to determine its properties.

Unknown wastes are unlabeled, improperly or incompletely labeled, or have illegible labels. Legacy chemicals or containers where the contents cannot be readily identified may also be considered as unknown waste.

The cost for any necessary lab tests to determine the identity and/ or characteristics of any unknown waste materials generated in any instructional or research lab will be the responsibility of the department or research PI.

Characteristic Waste

All of the characteristic waste described below are considered hazardous waste and are to be collected for disposal. Contact the UAA CHO (786-1279).

The four general waste characteristics are:

- Ignitability

- Corrosivity
- Reactivity
- Toxicity

Ignitable characteristics

Waste exhibiting the characteristic of ignitability has one of the following properties:

- It is a liquid other than an aqueous solution containing less than 24% alcohol by volume and has a flash point less than 60^{o} C.
- It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
- It is an ignitable (flammable) compressed gas.
- It is an oxidizer.

Corrosive characteristics

Waste exhibiting the characteristic of corrosivity has either of the following properties:

- It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5.
- It is a liquid and corrodes steel.

Reactive characteristics

- Waste exhibiting the characteristic of reactivity has any of the following properties:
- It is normally unstable and readily undergoes violent change without detonating.
- It reacts violently with water.
- It forms potentially explosive mixtures with water.
- When mixed with water, it generates toxic gases, vapors, or fumes in a quantity to present a danger to human health or the environment.
- It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.
- It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Toxic characteristics

Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead,

etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water.

Waste exhibiting the characteristic of toxicity has the following:

A representative sample contains any of the contaminants listed in Table 1 of 40 CFR Subchapter I, 261.24 at the concentration equal to or greater than the respective value given in that table.

List of toxic contaminants is below:

- Arsenic
- Barium
- Benzene
- Cadmium
- Carbon tetrachloride
- Chlordane
- Chlorobenzene
- Chloroform
- Chromium
- o-Cresol
- m-Cresol
- p-Cresol
- Cresol
- 2,4-D
- 1,4-Dichlorobenzene
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- 2,4-Dinitrotoluene
- Endrin
- Heptachlor and its epoxide
- Hexachlorobenzene
- Hexachlorobutadiene
- Hexachloroethane
- Lead
- Lindane
- Mercury
- Methoxychlor
- Methyl ethyl ketone
- Nitrobenzene
- Pentachlorophenol
- Pyridine
- Selenium
- Silver
- Tetrachloroethylene
- Toxaphene
- Trichloroethylene
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol
- 2,4,5-TP (Silvex)
- Vinyl chloride

Waste Disposal Restrictions

The hazardous waste disposal facility used by UAA has restrictions as to what they will accept for disposal. Restrictions are constantly changing, and you must contact EHS/RM if you have any question regarding waste disposal or requirements.

Current DOT classes NOT accepted at the MOA Hiland Landfill site

DOT Code	Example
4.1 – Flammable solid	Magnesium ribbon, Sodium methoxide
4.2 – Spontaneously combustible material	Potassium tert-butoxide, Sodium dithionite
4.3 – Dangerous when wet	Propylmagnesium chloride in Diethyl ether
5.1 – Oxidizer	Lead nitrate, Periodic acid
5.2 – Organic peroxide	Benzoyl peroxide
6.1 – Poisonous material	Sodium azide
6.2 – Infectious substances	Human blood, Bone

Hazardous Waste Packaging and Labeling

Federal and state regulations require that all waste containers be closed while not in use. Storing an open waste container in a hood or anywhere in a work area is a violation.

Label containers as "Hazardous Waste" and list contents of the container on the Hazardous Waste label. Waste constituents must be spelled out completely — no abbreviations, formulas or structures.

Do not put acid waste in metal containers, as the containers will corrode and leak as well as evolve flammable hydrogen gas.

Separate and protect ignitable waste from ignition sources.

Containers must be free of contamination on the outside, securely closed and capable of containing the waste inside. Container size should fit the amount of waste inside as nearly as possible to reduce disposal cost.

Do not use biohazard bags for the storage of chemical wastes.

10. Inspections

To ensure hazardous waste at UAA is managed properly the following inspections are required:

Periodically, areas that produce hazardous waste must inspect any storage of waste to ensure all wastes are being labeled, stored, and disposed of in a timely manner.

Annually, EHS/RM will complete a thorough inspection of hazardous waste management using the UAA Hazardous Waste Checklist (Appendix B).

11. Training

UAA shall provide a training program for each employee generating or handling hazardous waste as necessary.

The program shall enable each employee to identify potential hazardous waste streams, recognize hazards and regulatory requirements related to hazardous waste, and shall train each employee in the procedures to be followed to minimize these hazards.

The employer shall ensure that each employee has been trained by a competent person in the following areas, as applicable:

- Identification of hazardous wastes in the work area
- Proper handling of hazardous wastes, including storage containers, labeling, communication, and PPE requirements
- Procedures for hazardous waste spill response and clean-up

- The maximum accumulation amounts and time limits

Retraining shall be provided for each employee as necessary if an accident occurs, new waste streams are identified, a near loss incident has occurred, or there is a change in the generator status and requirements, so that the employee maintains the understanding and knowledge acquired through compliance with this section.

12. Program Evaluation

The hazardous waste program shall be evaluated on an annual basis utilizing the protocols set forth by EHS/RM. The evaluation team will consist of a department safety coordinator and a designee from EHS/RM. EHS/RM will define the scope of the evaluation. The final report will be developed by the EHS/RM utilizing the information received during the evaluation. The deficiencies determined in the report will be documented and corrective action plans will be developed.

13. References

Regulations that apply to hazardous waste are included below.

- EPA Standards Applicable to Generators of Hazardous Waste 40 CFR Part 262
- Alaska Administrative Code Chapter 62 Hazardous Waste

Revision Number	Date Revised	Description of Change	Revised By	Approved By
1				
2				
3				

Appendix A: UAA Hazardous Waste Procedure Template

Waste Name:	
Department/ Lab Generating Waste Stream	
Process generating waste:	

Chemical Hazards:

List all chemicals and reagents included in this waste stream. Add more rows as needed.

Chemical/ Reagent name	CAS# (if none, enter 'see SDS')	GHS Non-hazardous? Y or N

Safety Considerations:

List all potential hazards and precautions to take to mitigate them here. Add more rows as needed

Hazard	Precautions

Tools and Equipment:

The following tools and equipment are needed to handle this material. Add more rows as needed

Tools/Equipment	Use (if explanation is needed)

Incident History:

List any incidents here that have occurred while handling this material. Add more rows as needed

1	
2	
3	

Storage Requirements:

Include special instructions for storage area, container type, labeling, storage quantities, etc. Add more rows as needed:

1	
2	
3	

Handling Procedures:

Step by step actions to be taken while handling this material. Add more rows as needed.

Steps	Action
1	
2	
3	
4	

Waste Disposal Procedures:

List steps to be taken for proper decontamination and disposal if all material will not be consumed during the process. Add and adjust steps as necessary.

Steps	Actions
1	Decontaminate disposable items (e.g. pipet tips, plates) and empty chemical containers by triple rinsing with a liquid that will dissolve the material.
2	If water is the solvent, the first rinsing only must go into an appropriate waste container, the remaining rinses contain de minimus quantities of hazardous material and may go in the sink with the water running.
3	If a non-aqueous solvent is used, all rinses must go into an appropriate waste container and the rinsed container placed in a fume hood to allow remaining vapors to be drawn up the hood. Decontaminated items can go in non-hazardous trash.
4	Identify amounts of waste anticipated and appropriate disposal procedures. Segregate waste by hazard class (flammable, corrosive, etc.), state (liquid, solid) and, for organic solvents halogenated and non-halogenated. Store waste appropriately for the hazard class. Contact the CHO or CAS Stockroom Manager if you need assistance.
5	Affix hazardous waste label on all waste containers as soon as the first drop of waste is added to the container.
6	Store hazardous waste in closed containers, in secondary containment, and in your laboratory's designated location. Waste containers MUST be closed at all times, except when waste is being added to the container. Waste containers are considered FULL when they contain approximately 75% of the maximum volume. DO NOT OVERFILL – this is an exposure hazard for all persons handling and disposing of the waste.
7	Call EHS or Lab Support (CAS only) to have full waste containers picked up for disposal by EHS

Documentation of Training and Proficiency
Add additional lines as necessary.

I have read and understand the content of this SOP.

Name - Print	Signature	Date	PI's Initials

Attachment B

UAA Hazardous Waste Checklist

Date Inspected:

Inspected By:

EPA ID

Recordkeeping Requirements:	Yes	No	Comments
Waste determination for all waste streams sent off-site are on file?			
All original and coy signed by TSDF waste manifests are on file for past 3 years?			
Have waste haulers been vetted to ensure compliant with all EPA and DEC regulations?			

Waste Management:

Location(s):

List of hazardous waste streams

	Yes	No	Comments
All Waste containers labeled "Hazardous Waste" with clear accurate description of contents or if a universal waste labeled "Universal Waste [type of waste]"?			
All waste containers in good condition and compatible with contents?			
Are all waste containers closed?			
Are incompatible waste separated?			
Are waste containers protected from area activity?			
Do any wastes need to be set up for disposal or additional waste streams need to be created?			