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Specification  
for  
**Hazardous Waste Management**

REVISION

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## 1. INTRODUCTION

- 1.1 This procedure is for use at [the Albany Nanotech Complex](#) to assist in maintaining compliance with the state and federal environmental regulations which apply to the management of hazardous waste. The content of this specification and the attached hazardous waste inspections/audit checklists is not intended to address every aspect of hazardous waste management regulations. It is intended to provide an overview of the role each NY CREATES / SUNY Poly employee in complying with the sections of the regulations that relate to their activities at [the Albany Nanotech Complex](#).

## 2. PURPOSE

- 2.1 To provide a written procedure on the proper handling, storage and shipment for disposal of solid, liquid and gas chemical waste products. For general purposes of this procedure, these chemical products shall be referred to as "Hazardous Waste." See definitions below for the specific regulatory definitions.
- 2.2 To meet all Local, State, and Federal hazardous waste management requirements.
- 2.3 To ensure the safe handling, storage, shipping and disposal of our hazardous waste
- 2.4 To reduce costs associated with removal of hazardous wastes from our site by minimization through proper segregation and/or consolidation.
- 2.5 Provide written documentation on the tracking of our hazardous waste from its point of generation to its final disposal destination.

## 3. SCOPE

This procedure should be followed utilizing the definitions below, along with the instructions for completing the appropriate hazardous waste labels to maintain compliance with the waste generation and management regulations at every applicable level within the [Albany Nanotech Complex](#). Attachment 3 – Hazardous Waste Container/Storage Area Inspection Log is provided as a means for each laboratory, cleanroom, or other hazardous waste generation point at the [Albany Nanotech Complex](#) to assure they are complying with the regulations.

- 3.1

## 4. DEFINITIONS

The following definitions apply to this procedure and the corresponding Hazardous Waste Management Guidelines and Accumulation Point Compliance Audit Checklists:

- 4.1 **Hazardous Waste** – to be considered hazardous waste something must first be considered a solid waste. For the purposes of the federal regulations, solid waste can be a solid, liquid, or gas that has been declared surplus, scrap and otherwise no longer wanted or needed, or is inherently waste-like. Hazardous waste can be either a specifically listed waste or a characteristic waste.
- 4.2 **Listed Hazardous Waste** – includes any solid waste that is specifically listed as generated from either non-specific sources, specific sources, or off-spec or discarded commercial products, and spill residues from these products.
- Non-Specific Wastes (“F” list wastes) include halogenated and non-halogenated degreasing solvents, plating bath solutions and sludge, wastewater and sludge from treatment of various process effluents.
  - Wastes from Specific Sources (“K” list wastes) such as distillation still bottoms from production of various organic compounds, such as plastics, pesticides, pharmaceuticals, as well as sludge from treatment of primary metal process wastewaters.
  - Acute Hazardous Wastes (“P” and “U” list wastes) are primarily off-spec commercial chemical products and intermediates.
- 4.3 **Characteristic (of) Hazardous Waste** – includes wastes that demonstrate the general characteristics of ignitability, corrosivity, reactivity, or toxicity.
- Ignitable Wastes (EPA code D001) are those with a flash point less than 140°F (60°C), by a Pensky-Martens closed cup or similar test method.
  - Corrosive Wastes (EPA code D002) are either liquids that have a pH less than or equal to 2 or greater than or equal to 12.5, or corrodes steel at a rate greater than 0.25 inches per year.
  - Reactive Wastes (EPA code D003) are those that are normally unstable, readily undergo violent change without detonating, react violently with water, form potentially explosive mixtures with water, generate toxic gases or vapors when mixed with water, or are capable

of detonation or explosive decomposition with or without addition of heat and pressure.

- Toxic Wastes (EPA code D004 through D043) exhibit the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, the extract from a representative sample of the waste contains any of the contaminants listed in the federal regulations at a concentration equal to or greater than the respective value. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract.

- 4.4 **Generator (of Hazardous Waste)** – is any person, by site, whose act or process produces hazardous waste as defined in Part 371 (see 4.1- 4.3 above). Each individual researcher, student, intern, or staff member who utilizes hazardous materials and decides they are no longer useful and need to dispose of them is a generator.
- 4.5 **Satellite Accumulation Area** – means an area located at or near the point (lab, clean room, tool, etc.) where the generation of hazardous waste initially occurs, and is under the control of the operator of the process generating the waste.
- 4.6 **Regulated Medical Waste (RMW)** means waste generated in diagnosis, treatment or immunization of humans, or animals, in research pertaining thereto, or in production and testing of biologicals; provided, however, that regulated medical waste must not include hazardous waste and household medical waste,
- 4.6.1 Regulated Medical Waste Includes:
- Cultures and stocks of infectious agents, culture dishes and devices used to transfer, inoculate or mix cultures that have come into contact with or are known to be contaminated with biological agents infectious to humans, or agents of economic concern (e.g., foreign animal diseases);
  - Human pathological waste, including tissue, organs, body parts, excluding teeth and contiguous structures of bone and gum, body fluids removed during surgery, autopsy or other medical procedures, specimens of body fluids and their containers, and discarded materials saturated with body fluids other than urine. Human pathological waste must not include urine or fecal material submitted for purposes other than diagnosis of infectious diseases;

- Human blood and blood products, including their components (e.g., serum and plasma), containers with free-flowing blood, discarded blood products as defined in 10 NYCRR Subpart 58-2, and materials saturated with flowing blood (except feminine hygiene products);
- Sharps, whether used or unused, including residential sharps accepted by a facility regulated under article 28 of the Public Health Law pursuant to section 1389-dd(4) of the Public Health Law;
- Animal waste, including animal carcasses, body parts, body fluids, blood or bedding originating from animals known to be contaminated with infectious agents or from animals inoculated with infectious agents for purposes including, but not limited to, research, production of biologicals, or drug testing. Body fluids include urine and feces when infectious agents are known to be shed in the urine and feces; and
- Any other waste materials containing infectious agents designated by the Commissioner of Health as regulated medical waste.

#### 4.6.2 Regulated Medical Waste Does NOT Include:

- Human cadavers managed in accordance with article 42 of the Public Health Law and the New York State Department of State rules for cemeteries and crematories;
- Discarded and essentially empty urine collection bags and tubing, urine specimen cups, urinary catheters, bedpans contaminated with feces, and urine bottles, unless the item was submitted as a clinical specimen for laboratory tests or the patient was found to have a disease transmitted through urine or feces;
- Tissue blocks of organs or tissues which have been fixed in paraffin or similar embedding materials for cytological or histological examination;
- Organs, tissue or recognizable body parts that have been removed during surgery or child birth, except a fetus, and retained by the patient for religious or other purposes provided that the organs, tissue or body parts are not provided to another person in any form, and are not a potential source of disease transmission, as determined by a health care professional;
- Bandages, gauze, or cotton swabs or other similar absorbent materials unless they are saturated or would otherwise release blood or human body fluids, other than urine, if compressed;
- Housekeeping waste from hotels, except medical waste generated from the provision of healthcare at a hotel;

- Cleaned soiled bedding from commercial laundry facilities that is intended for reuse;
- Veterinary medical waste, if generated by the owner of a companion animal;
- Medical waste, including sharps, generated through the self-administration of medicine in a household, excluding waste containing cultures;
- Pharmaceutical waste generated in a household;
- Contaminated foodstuffs;
- Genetically modified or attenuated infectious agents and their products used in the diagnosis, treatment or immunization of human beings or animals or for research or production of biologicals, including attenuated vaccines, antigens and antitoxins provided genetic modification or attenuation has been conducted to render the infectious agent non-infectious;
- Bandages, gauze, or cotton swabs or other similar absorbent materials that are saturated or would otherwise release blood or human body fluids if compressed and that are generated from cosmetology, ear piercing or tattooing;
- Materials containing an infectious agent at a concentration naturally occurring in the environment, including samples for routine laboratory analyses of foodstuffs, environmental samples, quality control samples, etc.;
- Medical equipment that is not mixed with RMW and is intended for reuse in a medical setting or equipment used for testing where the components within which the equipment is contained, essentially function as packaging; and
- Used health care products not conforming to the requirements in 29 CFR 1910.1030 and being returned to the manufacturer or the manufacturer's designee if transported in accordance with 49 CFR 173.134(b)(12). This does NOT apply to used health care products being transported for treatment as RMW.

## 5. RESPONSIBILITIES

- 5.1 It is the responsibility of each individual at NY CREATES / SUNY Poly who generates a hazardous waste at [the Albany Nanotech Complex](#) to

ensure that the proper procedures are followed for handling and disposing of the hazardous waste generated. The generator is responsible to properly characterize, package and label the waste with the appropriate hazard information.

- 5.2 It is the responsibility of each NY CREATES / SUNY Poly Manager (host), who contracts the services of contractor/vendor personnel (contractor) to perform work [at the Albany Nanotech Complex](#), to ensure that the contractor is aware of the potential hazards associated with the required work and the proper procedures for handling and disposing of the hazardous waste generated by their activities.
- 5.3 Outside contractors/vendors whose job requires them to work with or around or generate hazardous waste shall adhere to all requirements of this specification.
- 5.4 Contractors shall remove all hazardous materials which they brought on-site after the completion of their job, and follow all applicable regulatory requirements.
- 5.5 Contractors shall **not** remove hazardous materials which arise from the work that they perform on-site.
- 5.6 It is the responsibility of the each NY CREATES / SUNY Poly Manager (host), who contracts the services of contractor/vendor personnel (contractor) who performs work [at the Albany Nanotech Complex](#) to arrange for the proper disposal of Hazardous Waste through the NY CREATES EHS. Whenever possible, disposal arrangements should be made prior to the generation of the hazardous waste.
- 5.7 It is the responsibility of the hazardous gas and chemical handling firm (contracted by NY CREATES / SUNY Poly) to collect the hazardous wastes generated at point of generation (e.g., labs, cleanrooms, equipment rooms, etc.) and transport them to the appropriate permitted hazardous waste storage location (90 Day Area or Central Accumulation).

## 6. HAZARDS OF CURRENT WASTE STREAMS

The potential hazards which may be encountered when handling hazardous wastes generated by activities at [the Albany Nanotech Complex](#) include the following:

### 6.1 Solvent Waste

- Ignitable - most solvents (alcohols, acetone, Propylene Glycol Monomethyl Ether Acetate (PGMEA), etc.) are flammable, thus it is important that they are isolated from ignition sources.

- Reactive - can result in extreme reactions if contacted with acids, bases or other incompatible materials (e.g., Hexamethyldisilazane (HMDS) & water).
- Toxic - may cause skin irritation due to contact. Inhalation of high concentrations may cause nose and throat irritation, lung, kidney and liver damage (e.g., n-methyl-2-pyrrolidone -NMP).
- Volatile - odor easily detectable at low concentrations (PGMEA).

## 6.2 Corrosive (Acid or Caustic) Waste

- Corrosive (Acidic pH < 2.0) – such as Hydrochloric (HCl) or Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) can cause chemical burns to skin and eyes if contacted. Some, like Hydrofluoric Acid (HF) are particularly dangerous and require special medical attention, if contacted.
- Corrosive (Caustic/Basic pH >12.5) – such as Sodium Hydroxide (NaOH) or Ammonium Hydroxide (NH<sub>4</sub>OH) can cause severe burns to the skin and eyes on contact. Tetra Methyl Ammonium Hydroxide (TMAH), in addition to causing burns on contact can be fatal if significant quantities are absorbed through the skin.
- Reactive – Acids and caustics may cause extreme reactions if mixed together. Concentrated acids (e.g. fuming Nitric acid >30%) are strong oxidizers and should not be mixed with organic materials including organic acids (e.g. acetic or lactic acid) or solvents. Concentrated acids (e.g. >50% Sulfuric Acid) or caustics (e.g. > 50 % Sodium Hydroxide will react with water resulting in splattering.
- Toxic - prolonged breathing of vapors can cause moderate to severe respiratory irritation, (e.g., Nitric Acid) which can also progress to death.

6.3 **Toxic/Poison Waste** depending upon material, can cause organ damage due to inhalation (e.g., HBr, HCl, and HF), ingestion (e.g., Formaldehyde), or absorption through skin (e.g., TMAH, nitric acid, phenol).

## 6.4 Oxidizer Waste

- Corrosive - can cause chemical burns to skin and eyes if contacted (e.g., 30% Hydrogen peroxide, Nitric Acid).
- Reactive – may cause extreme reactions if mixed with organics (e.g., 30% Hydrogen peroxide)



## 6.5 Mixed Wastes

6.5.1 Piranha Solutions are mixtures of (1 part) sulfuric acid, (1 part) hydrogen peroxide and (15 parts) de-ionized water.

6.5.1.1 Piranha solution can be explosive. Mixing the solution is exothermic. The resultant heat can bring solution temperatures up to 120°C (248°F). One must allow the solution to cool reasonably before applying any heat. The sudden increase in temperature can also lead to violent boiling, or even splashing of the extremely acidic solution.

6.5.1.2 Piranha solution that is no longer being used should never be left unattended if hot. It should not be stored in a closed container. Mixing piranha with organic solvents (acetone, isopropyl alcohol, etc.) will cause an explosion. Adding anything to the piranha solution (such as a substrate that may have organic residue), must be done slowly and carefully, giving the solution time to stabilize.

6.5.1.3 Prior to disposal, the gases from the piranha solution must be allowed to dissipate and the solution must be allowed to cool to <40°C or <104°F, before being placed in a labeled, high-density plastic container with a vented cap. Under no circumstances should used piranha solution ever be disposed of by flushing it down the drain.

6.5.2 Mixed Solvent Waste solutions often contain a mixture of flammable solvents (e.g., Alcohols, PGMEA).

6.5.3 Mixed Acids Waste streams often contain several mineral acids (e.g., HCl, Sulfuric acid, Nitric Acid). Care should be taken not to mix mineral or inorganic acids with organic acids or with corrosive caustic materials (e.g., NaOH, NH<sub>4</sub>OH) or with organic solvent waste streams.

## 7. TRAINING REQUIREMENTS (FOR PERSONNEL HANDLING HAZARDOUS WASTE)

Personnel who generate, handle, transport, or ship hazardous waste shall receive the following training. It is the responsibility of the employee's Manager to ensure that they receive this training within six months after they are first hired, or transferred into their position, and annually thereafter. All training sessions must be documented with the EHS Department.

### 7.1 Generators

7.1.1 Orientation Training - upon arrival at the facility

- 7.1.2 Lab Safety and/or Cleanroom Safety – initial and as required by area owner
- 7.1.3 Area Specific Hazardous Waste Procedures - upon entry into job function; and periodic there after
- 7.1.4 Hazardous Waste Training - Annual
- 7.2 **Hazardous Material Handlers (in addition to all of the above)**
- 7.2.1 RCRA Training - upon entry into the job function & annual
- 7.2.2 Respirator Use - Annual
- 7.2.3 Personal Protective Equipment (PPE) - upon entry into the job function & recurrent, as needed
- 7.3 **Emergency Response Team (ERTs) (in addition to 7.1)**
- 7.3.1 Chemical Spill Clean-Up Training - Annual
- 7.4 **Shippers of Hazardous Waste (in addition to all of the above)**
- 7.4.1 DOT HM181 Training (Initial and refresher every 3 years)

## 8. WASTE SEGREGATION AND LABELING

- 8.1 The generator is responsible for properly segregating hazardous waste at the point of generation to minimize the potential for incompatible chemicals mixing with adverse chemical reactions.
- 8.2 Generators are responsible for ensuring that wastes are compatible with the collection system/containers they are placed in. For example, never place hydrofluoric acid waste in glass containers.
- 8.3 **Hazardous Waste Accumulation Container Label** (applicable to containers in 90-Day Storage Area)
- 8.3.1 All containers holding hazardous waste products shall have a (red) Hazardous Waste label affixed to them (see Attachment #1). The label shall be filled out to include:
  - Waste type (liquid or solid or mixed)
  - Chemical contents (product name and major chemical component if different)
  - Associated hazard (ignitable, corrosive, toxic, reactive)

**NOTE:** If waste product does not possess one of the above hazards, it requires a green "Non-Hazardous Waste" label (see attachment #2). Contact EHS department for extra labels or assistance in completing.

- Start Date (date material first placed within container)
- Full Date (date container is full or done being used)
- If available on label, generator name and telephone number (name of individual filling the container)
- If available on label, department (specific work area, lab or tenant generating the waste)

#### 8.4 **Satellite Accumulation Area Container Labels**

8.4.1 All containers holding hazardous waste products at satellite locations shall also have a (red) Hazardous Waste label affixed to them (see Attachment #1).

8.4.2 Labels for such containers shall have the "Satellite" box checked when they are in the satellite accumulation area. The label shall also be filled out to include:

- Waste type (liquid or solid or mixed)
- Chemical contents (product name and major chemical component if different)
- Associated hazard (ignitable, corrosive, toxic, reactive)
- Start Date (date material first placed within container)
- Generator name and telephone number (name of individual filling the container)
- Generator department (specific work area, lab or tenant generating the waste)
- Full Date shall be added to the container and the container shall be placed in the satellite accumulation bin. When the container is full or done being used, the waste handlers then have three days to remove such containers to the Hazardous Waste Storage Building (90-Day Storage Area).

8.5 Preprinted labels are available in the EHS office to ensure that all containers of hazard waste are marked with the words 'hazardous waste' and other words identifying the contents in accordance with the

requirements set forth in 6 NYRCC 372.2 (a) (8)(i)(a). The waste container will be provided by the gas and chemical handling firm.

**IMPORTANT:** During spill clean-up, it is the responsibility of the ERT to ensure that the generated hazardous wastes are properly segregated, contained and labeled.

## 9. CONTAINER TRANSPORTATION

- 9.1 Persons required to handle, transport or ship containers of hazardous waste shall wear the appropriate PPE.
- 9.2 Any PPE or chemical container coverings that are contaminated during the course of handling, transporting or shipping containers of hazardous waste shall be placed in the appropriate contaminated solid hazardous waste bin.
- 9.3 Persons required to transport containers of hazardous waste shall do so using a dedicated hazardous waste cart.
- 9.4 Persons required to ship containers of hazardous waste shall follow all guidelines set forth by the Department of Transportation (DOT) under 49 CFR Part 105-107, 171-180, and 390-397.
- 9.5 Containers must have their tops/covers/bungs secured firmly in place whenever being transported.
- 9.6 Persons responsible for transporting containers of hazardous waste from the generating area or satellite location shall also provide that area with an empty container upon request.

## 10. HAZARDOUS WASTE CONTAINER AND STORAGE

A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

- 10.1 **All Waste Containers Must:**
  - 10.1.1 Have their tops, covers and/or bungs secured firmly in place except when adding waste to the container.
  - 10.1.2 Be placed on a surface which does not show any cracks or gaps and is impervious to the hazardous waste being stored.
  - 10.1.3 Be stored in separate aisles/areas from virgin chemical materials.

- 10.1.4 Be maintained and cleaned properly of any spill residues.
- 10.1.5 Be placed so that their labels are visible.
- 10.1.6 Be compatible with the waste that is being accumulated.
- 10.1.7 Have no mechanical or electrical equipment stored on top of the Hazardous Waste Storage Container.
- 10.1.8 For flammable (Ignitable) hazardous waste containers, greater than one (1) gallon, either be in a steel closed-top (DOT 17-E) drum obtained from the sub fab through the gas and chemical handling firm, or in a metal receptacle (Solvent can) with a self-closing lid and be grounded to prevent sparking.
- 10.1.9 For hydrofluoric acid (HF) waste, it should only be stored and transported in HDPE drums, never in glass or metal containers.
- 10.2 **All Hazardous Waste Accumulation Areas must comply with the following:**
- 10.2.1 Secure against unauthorized entry.
- 10.2.2 Clearly delineated (e.g., walls, fence, tape or other visible barrier) and be separate from any points of generation.
- 10.2.3 Clearly posted with a sign or label with the words "HAZARDOUS WASTE" The words must be a minimum of one inch in height and be in capital letters
- 10.2.4 Constructed with secondary containment (outdoor storage) that may consist of a berm or a dike with an impervious surface and must be large enough to hold:
- 10% of the total volume of all containers, or
  - 110% of the volume of the largest container, whichever is larger
- 10.2.5 Accumulation and storage areas should be kept neat and orderly with adequate aisle space for access in the event of a release or for an inspection.
- 10.3 **Satellite Accumulation Locations**
- 10.3.1 When hazardous waste is stored within its area of use (e.g. laboratory or cleanroom) the area is determined to be a Satellite Hazardous Waste Location and is in full compliance with 6 NYCRR (372.2) if:

- 10.3.2 The waste is generated from a process within the area.
- 10.3.3 The area is managed by the person directly responsible for the process producing the waste.
- 10.3.4 No more than one container up to a 55-gallon drum per waste stream is in use at any one time.
- 10.3.5 As soon as waste is placed inside a container, the container must be dated under 'start date'.
- 10.3.6 When the container is full or done being used, it is again dated under 'full date' and relocated immediately to the dedicated satellite accumulation storage area/bin, if applicable, and then transported to the Hazardous Waste Storage Shed within three (3) days.
- 10.3.7 In cases where the satellite accumulation containers house solid hazardous waste, such containers shall be a metal, step-on-can type container, lined with a yellow, 6 mil or similar, hazardous waste bag and have a label on the outside that identifies the waste that is contained inside. The bag/liner must be labeled with a red hazardous waste sticker that identifies the content prior to being placed in the container.
- 10.4 There are numerous waste accumulation areas, including satellite accumulation areas onsite, new accumulation locations must be requested, reviewed and approved by the EHS Department only. See Attachment 5 for a list of the satellite accumulation areas we have on site and the checklist that may be used for inspecting these areas.
- 10.5 The purpose of this review is to ensure that the proper approvals, training, labeling and storage requirements are considered and acceptable.
- 10.6 Once the waste stream is reviewed and the necessary requirements met, a waste profile has been created or can be included in an existing waste profile the waste stream will be approved for use. Contact EHS for a list of approved waste profiles.
- 10.6.1 All containers in the 90-day storage areas must be inspected weekly by completing the Hazardous Waste Inspection Log (see Attachment #4).

## 11. REGULATED MEDICAL WASTE

- 11.1 The campus does not generate BSL-3 or BSL-4 wastes; it does not handle any select agents or toxins (*a biological agent or toxin determined to have the potential to pose a severe threat to public health or safety, to animal or plant health, or to animal or plant products as outlined in 7 CFR part 331,*

*9 CFR part 121, and 42 CFR part 73, as incorporated by reference in Section 360.3 of this Title).*

- 11.2 The campus does not *treat* any regulated medical waste (RMW).
- 11.3 Any campus autoclave use will not constitute *treatment* under this SOP. Use of autoclave may reflect pedagogical needs, convenience or an effort to slow progression to putrescence. Waste that has been subjected to campus autoclave use will continue to be handled as regulated medical waste.
- 11.4 The campus does not compress or compact RMW.
- 11.5 The campus does not use bulk packaging.
- 11.6 The campus does not accept RMW from other parties.
- 11.7 The campus has a compliance plan to meet the requirements of OSHA's Bloodborne Pathogens rule, 29 CFR 1910.1030, as adopted by PESH Bloodborne Pathogen Exposure Control Plan (**EHS-00012**).
- 11.8 Movement of Regulated Medical Waste onsite shall be moved only if it's in a [sealed](#) secondary container.
- 11.9 **Sharps containers shall:**
- Never exceed the fill line.
  - Serve as the secondary container.
- 11.10 **Primary Container:**
- Must provide protection from the elements and exposure to employees and the public
  - Shall be prominently labeled with either the biohazard symbol or the words "biohazard".
  - Shall be impervious to moisture, secure and situated, so as to not leak or pose the risk of losing the contents.
  - Shall be in a low traffic area, and vermin and insect free.
- 11.11 **Secondary Container:**
- Shall be a hard-walled container that is leak-proof and puncture-resistant, as well as closable

- Shall be any container that is used to house a primary container (e.g., cardboard box, sharps container, or drum)
- 11.12 The CUB has been designated as the Regulated Medical Waste storage area and must have the following:
- Proper signage designating it as a regulated medical waste storage area
  - Limited access
  - Provide protection from vermin and the elements
  - Be temperature controlled to prevent decomposition and odor
  - Proper ventilation
  - Clear separation from any other waste
- 11.13 Shipping of Regulated Medical Waste from site must comply with the following:
- 11.13.1 Waste will not have been stored more than 30 days.
- 11.14 Waste must be shipped through a regulated medical waste transporter. This firm will comply with all applicable regulations including obtaining transport permits from the NYS Department of Conservation and will comply with all applicable local, state and federal regulations.
- 11.14.1 All waste must be in a secondary container with a label affixed that provides the following:
- Name and Address of the generating facility
  - A marking that discloses that the contents are infectious or regulated medical waste
- 11.14.2 All shipments are to be accompanied by a Regulated Medical Waste Tracking Form as required by NYSDEC.
- 11.15 Records of all shipments must be retained for 3 years from the date of disposition.
- 11.16 A report containing the amount of medical waste generated annually segregated by quantity and type shall be submitted to the commissioner of Environmental Conservation, upon request.



## 12. UNIVERSAL WASTE

- 12.1 Universal wastes generated at the [Albany Nanotech Complex](#) include such items as hazardous batteries, hazardous mercury-containing thermostats, certain pesticides, and hazardous lamps.
- 12.2 The CUB has been designated as the main Universal Waste Accumulation Area. Universal Waste stored in any other location is unauthorized and in violation of this policy and NYSDEC policy.
- 12.3 Universal wastes must be handled in such a manner that prevents releases of any universal waste or component of a universal waste to the environment.
- 12.4 The universal wastes must be contained in a container that remains closed, is structurally sound, is compatible with the waste it is containing, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.
- 12.5 **Labeling**
- 12.5.1 As soon as the universal waste is placed in an accumulation container, the generator **must date** the container and identify the contents as follows:
- 12.5.2 Universal waste batteries (i.e., each battery), or a container in which the batteries are contained, must be labeled or marked clearly with any one of the following phrases: "Universal Waste - Battery(ies)," or "Waste Battery(ies)," or "Used Battery(ies);"
- 12.5.3 Universal waste thermostats (i.e., each thermostat), or a container in which the thermostats are contained, must be labeled or marked clearly with any one of the following phrases: "Universal Waste - Mercury Thermostat(s)," or "Waste Mercury Thermostat(s)," or "Used Mercury Thermostat(s)".
- 12.5.4 Each lamp or a container or package in which such lamps are contained must be labeled or marked clearly with one of the following phrases: Universal Waste-Lamp(s), or Waste Lamp(s), or Used Lamp(s).
- 12.6 Heavy items should not be placed on top of lamps or boxes that contain lamps/bulbs.
- 12.7 Broken bulbs or mercury containing lamps must be placed hard-walled container and labeled as Hazardous Waste – Mercury Contaminated Solids.

- 12.8 All universal waste shall be removed from site within 1 year of the accumulation start date. **Any container over 1-year-old is in violation of this policy and DEC/EPA regulation.**

### 13. EMPTY CONTAINERS COLLECTION

- 13.1 Empty container collection bins are available for collecting empty bottles that once had flammables/solvents, non-hazardous or corrosive materials in them.
- 13.2 A pair of bins for empty bottles can be found in:
- 13.2.1 The NFN Fab level tool move-in area.
  - 13.2.2 The NFN Subfab level tool move-in area.
  - 13.2.3 The NFSX loading dock
  - 13.2.4 The NFX tool move-in area.
- 13.3 Empty chemical containers **MUST** be capped before being placed into the bin.
- 13.4 Other trash should not be placed in these bins.
- 13.5 Empty bottle bins will be picked up by waste handlers and taken to the CUB to be triple rinsed, labeled triple rinsed I and then discarded.
- 13.6 Empty containers in the labs may be marked empty; please 3x rinse and place in the satellite accumulation area for that lab.

### 14. EXPIRED/UNWANTED CHEMICALS

- 14.1 If a chemical has expired or is no longer needed the EHS department must be notified to determine if other chemical users onsite could benefit from the use of this chemical.
- 14.2 If the chemical user does not receive notification within five days of their original request the chemical shall be deemed 'waste' and labeled in accordance with the guidelines of this procedure.
- 14.3 This labeled waste container shall be placed in the designated satellite accumulation area where it shall be picked up by the site waste handlers and transported to the Hazardous Waste Storage Building within 3 days.

- 14.4 Please note that small containers (<250 mL) may be placed in a Ziploc bag/ 5-gallon bucket with a hazardous waste label affixed to the outside of the bag/bucket, as soon as the first container is placed in there; instead of individually labeling each bottle.

## 15. ELECTRONICS

- 15.1 Scrap electronic equipment generated at the [Albany Nanotech Complex](#) include items such as Computers, Laptops, Monitors, Terminals, Printers, Mainframe/Midrange, Televisions, Network Equipment, Circuit Boards, Wiring & Cabling, Scientific Equipment, Business Machines, Electronic Scrap, Copiers, Fax Machines, and Cell Phones.
- 15.2 The CUB has been designated as accumulation area for all scrap electronics. Scrap electronics stored in any other location is unauthorized and in violation of this policy. They may however be placed in a pass-through or near an accumulation areas while awaiting collection.
- 15.3 The electronics shall be placed in the provided flex bin in the CUB by a Site Services or Academic Support Services worker.
- 15.4 Items that are too large for the flex bins are to be neatly stacked adjacent to the flex bins on a pallet.
- 15.5 **Labeling and Removal**
- 15.5.1 Electronics should be marked as scrap electronics by either writing directly on the equipment or attaching a note that says "Scrap Electronics"
- 15.5.2 Once a piece has been marked as "Scrap Electronics", the piece should be placed near either an office or lab door for collection.
- 15.5.3 If the electronic piece is coming out of the fab/subfab, the piece shall be placed in the chemical pass-through area for that fab/subfab.
- 15.5.4 Once the piece of scrap electronics has been placed for pickup an email should be sent to SUNYPolyfix: [cnsefix@sunypoly.edu](mailto:cnsefix@sunypoly.edu) for electronics in the fabs/subfabs, offices and all other areas.
- 15.6 Electronics will be shipped at a minimum of once a quarter and more frequently, if needed.

## 16. ATTACHMENTS

- 16.1 **Attachment 1** - Hazardous Waste Accumulation Label and Instruction on Completion

- 16.2      **Attachment 2** - Non-Hazardous Waste Accumulation Label and Instruction on Completion
- 16.3      **Attachment 3** - Universal Waste Accumulation Label and Instruction on Completion
- 16.4      **Attachment 4** – Hazardous Waste Area Weekly Inspection Log
- 16.5      **Attachment 5** – Satellite Accumulation Areas
- 16.6      **Attachment 6** – Broken Silicon Wafers (Non-Metalloid) with Chemical Contamination

### ATTACHMENT 1 HAZARDOUS WASTE ACCUMULATION LABEL AND INSTRUCTION ON COMPLETION

HAZARDOUS WASTE

**ACCUMULATION** (Check box if satellite )

Solid Waste  Liquid Waste  Mixed Waste

Ignitable (Flashpoint < 140°F) \_\_\_\_\_

Reactive  Toxic

Corrosive (pH<2.0) or (pH>12.5) \_\_\_\_\_

Start Date: \_\_\_\_/\_\_\_\_/\_\_\_\_    Fill Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Contact Name: \_\_\_\_\_ Department/Building/Tenant: \_\_\_\_\_

Chemical contents (product name or major chemical component): \_\_\_\_\_

HANDLE WITH CARE!  
CONTAINS HAZARDOUS OR TOXIC WASTES

Is the material in the container *solid, liquid, or mixed*? **ONE MUST BE CHECKED**

**FILL DATE** is the day you are done using the bottle for waste and decide to remove it or it becomes full. **THIS MUST BE FILLED OUT!**

**START DATE** is the day material was first added to the bottle.

Chemical Contents **MUST BE FILLED OUT** with product names or the major chemical component.

The **CONTACT NAME AND DEPARTMENT/BUILDING/TENANT** should be filled out by whoever adds material to the container so; if there are questions they can answer them.

Is the material in the container *Ignitable, Reactive, Toxic, or Corrosive*? **ONE MUST BE CHECKED IF NOT MORE THAN ONE!**

If the material is *CORROSIVE* either pH<2 or pH>12.5 **MUST** be either circled, underlined or written on the line in addition to corrosive being marked!

**ATTACHMENT 2  
NON-HAZARDOUS WASTE ACCUMULATION LABEL AND INSTRUCTION ON COMPLETION**

**NON-HAZARDOUS WASTE**

GENERATOR INFORMATION (Optional)  
SHIPPER SUNY Poly  
ADDRESS 251 Fuller Rd  
CITY, STATE, ZIP Albany, NY 12203  
CONTENTS \_\_\_\_\_

**NON-HAZARDOUS WASTE**

Contents need to be filled in so we know what is in the bottle.

### ATTACHMENT 3 UNIVERSAL WASTE ACCUMULATION LABEL AND INSTRUCTION ON COMPLETION



The image shows a purple and white 'UNIVERSAL WASTE' label. The top and bottom of the label feature the words 'UNIVERSAL' and 'WASTE' in large, bold, white letters on a purple background. The central white area contains the following fields:

- GENERATOR INFORMATION (Optional)**
- SHIPPER** \_\_\_\_\_ SUNY Poly \_\_\_\_\_
- ADDRESS** \_\_\_\_\_ 251 Fuller Rd \_\_\_\_\_
- CITY, STATE, ZIP** \_\_\_\_\_ Albany, NY 12203 \_\_\_\_\_
- CONTENTS** \_\_\_\_\_
- ACCUMULATION START DATE** \_\_\_\_\_

Two black arrows point from text boxes on the right to the 'CONTENTS' and 'ACCUMULATION START DATE' fields.

Contents need to be filled in so we know what is in the container.

Accumulation start date needs to be filled out when the first item is placed in the container.

## ATTACHMENT 4 HAZARDOUS WASTE AREA WEEKLY INSPECTION LOG

| HAZARDOUS WASTE AREA WEEKLY INSPECTION LOG |  |    |               |    |                          |    |         |    |         |    |       |    |           |    |       |    |           |
|--|--|----|---------------|----|--------------------------|----|---------|----|---------|----|-------|----|-----------|----|-------|----|-----------|
| AREA: _____                                |  |    |               |    |                          |    |         |    |         |    |       |    |           |    |       |    |           |
| STREAM NAME: _____                         |  |    |               |    |                          |    |         |    |         |    |       |    |           |    |       |    |           |
| DATE                                       | LABEL LEGIBLE  |    | LABEL CORRECT |    | BUNG/LID SECURE          |    | LEAKING |    | BULGING |    | ODORS |    | DRUM FULL |    | OTHER |    | SIGNATURE |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
|  | YES  | NO | YES           | NO | YES                      | NO | YES     | NO | YES     | NO | YES   | NO | YES       | NO | YES   | NO |           |
| NOTE:                                      | Please circle your finding for each compliance item during inspection/audit, and note any corrective action needed and taken below.<br>An answer in a shaded box would indicate corrective action necessary ( i.e. leaking drum repaired/overpacked or pumped immediately, bung replaced or secured if missing or loose,etc.). |    |               |    |                          |    |         |    |         |    |       |    |           |    |       |    |           |
| DATE:                                      |  |    |               |    | CORRECTIVE ACTION TAKEN: |    |         |    |         |    |       |    |           |    |       |    |           |
| DATE:                                      |  |    |               |    | CORRECTIVE ACTION TAKEN: |    |         |    |         |    |       |    |           |    |       |    |           |
| DATE:                                      |  |    |               |    | CORRECTIVE ACTION TAKEN: |    |         |    |         |    |       |    |           |    |       |    |           |



## ATTACHMENT 5 SATELLITE ACCUMULATION AREAS

|                             |                    |
|-----------------------------|--------------------|
| NFN/NFC Interior            | CESTM L236         |
| NFNST Interior              | CESTM L237         |
| SNW03 Spill Containment     | CESTM L324         |
| Chem. Pass-through          | CESTM L325         |
| NFSX Atrium                 | CESTM L326         |
| NFS/NFSX Interior           | CESTM L327         |
| NFX Interior                | CESTM L328/L329    |
| Ebara Scrubber Area         | CESTM L344         |
| NFS/NFSX Accum. Shelf       | CESTM B110         |
| Sub-fab Pass-through        | CESTM B125         |
| SGF01 Gowning Room          | NFE 1901           |
| SGF01 Cleanroom Space       | NFE 1904           |
| NFX 205 Gowning Area        | NFE 1906           |
| NFX 208 Gowning Area        | NFE 1907           |
| NFX 216 Gowning Area        | NFE 1909           |
| NFX 111                     | NFE 2901           |
| NFX III-V Wafer support RM2 | NFE 2902           |
| NFX Chem Mix Room (NFX 237) | NFE 2904           |
| N-208                       | NFE 4902           |
| CESTM L125                  | NFE 4903           |
| CESTM L126                  | NFE 4904           |
| CESTM L128                  | NFE 4905           |
| CESTM L129                  | NFE 4906           |
| CESTM L130                  | NFE 4907           |
| CESTM L135                  | NFE 4908           |
| CESTM L135 Annex            | NFN Chem Mix Room  |
| CESTM L136                  | HPM Corridor       |
| CESTM L233                  | NFN Sub-Fab        |
| CESTM L234                  | NFN 119            |
| CESTM L235                  | CUB Drum Wash Area |

## ATTACHMENT 6 BROKEN SILICON WAFERS (NON- METALLOID) WITH CHEMICAL CONTAMINATION

### 1. PURPOSE/SCOPE

- 1.1 To establish a procedure for dealing with silicon (whole or broken) wafers that **DO NOT** contain any of the following elements: [antimony](#), [tellurium](#), selenium, polonium, astatine and arsenic but are contaminated with other hazardous chemicals in cleanrooms and labs where wafers are generated or processed [at the Albany Nanotech Complex](#).

### 2. DEFINITIONS

- 2.1 **Silicon Wafer (non-metalloid)** - any wafer that **DOES NOT** contain any of the following elements selenium, polonium, [antimony](#), [tellurium](#), astatine and arsenic
- 2.2 **Hazardous Chemical** - any chemical that is ignitable, reactive, toxic, or corrosive

### 3. PROCEDURE

- 3.1 In the event of a wafer break you must first verify the wafer is not a metalloid wafer by contacting the Process Engineer or the Tool Owner.
- 3.2 If there are hazardous chemicals on the silicon wafer then you must first wipe all of the residual chemicals off with wipes in a fume hood while wearing the appropriate PPE including cut resistant gloves.
- 3.3 All wipes must be discarded in the appropriate step-on can or bagged as hazardous waste.
- 3.3.1 If you need additional guidance on labeling the wipes in the event they do not fit into one of the pre-established step-on cans please contact the EHS office at [SUNYPolyEHS@sunypoly.edu](mailto:SUNYPolyEHS@sunypoly.edu).
- 3.4 Once the wafer is free of hazardous chemicals the wafer can be disposed of in the broken wafers barrel in N-225 or in the control center.

**\*IMPORTANT:** For broken wafers containing Toxic Metalloid deposited layers, contact Security a **518-437-8600** to have ERT assist with clean-up and follow the broken wafer recovery procedures in the Toxic Metalloid Program (**EHS-00052**).