NMHU Hazardous and Potentially Infectious Wastes Management Plan

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Introduction

We should strive to minimize or prevent waste generation. Waste minimization is an action of both local and global significance. Faculty and staff are encouraged to share thoughts and ideas concerning waste minimization and prevention. Inevitably, some waste will be generated. ***NMHU is committed to managing its wastes in a safe and efficient manner.*** These procedures govern the management of RCRA hazardous wastes at the University.

Hazardous waste management is ruled by increasingly stringent and complex regulations. Management of chemical and hazardous wastes at the University is accomplished by the generator of the waste with the assistance of the Chemical/Biological Hygiene Officer, and, the Environmental Health and Safety Committee (EHS). EHS will assist generators on campus to help assure that wastes are managed in accordance with the regulations. However, it is the generator who is

ultimately responsible for assuring that waste generated is managed in a safe and appropriate manner.

Any waste material that may, upon contact, present a hazard to one's health or surrounding environment should be treated as a potentially hazardous waste. This includes spent or unused chemicals, cleaning solutions, oils, etc. If there is any doubt whether a material should be treated as hazardous, contact EHS. Only non-hazardous wastes may be disposed in the sewer or trash.

The Chemical/Biological Hygiene Officer, or an EHS designee, will pick up properly documented and packaged wastes, and, will store them prior to their final disposition. Waste is disposed of by contract and is usually picked up from the University [annually at most!]. The hierarchy of disposal methods used for the University's waste is reclamation and residual destruction, high temperature incineration, chemical/physical treatment, and secure landfilling.

Definitions

Solid waste is defined by EPA according to the Resource Conservation and Recovery (RCRA) as:

a) Garbage: Milk cartons, coffee grounds, food wastes, etc;
b) Refuse: Yard wastes, scrap metal, wall board, empty containers, etc;
c) Sludges: Sewage sludge, chemical sludges from laboratories, etc; and
d) Other discarded materials: Solid, semisolid, liquid, or contained gaseous materials resulting from industrial, commercial, mining, agricultural, and community activities, etc.

Hazardous wastes (hazwastes) are solid wastes with hazardous properties. Materials are considered hazardous wastes when:

1. Materials are listed in RCRA as hazardous wastes.

2. Waste materials that have any of the following properties:

a) Ignitability
   (a-1) A liquid, except aqueous solutions with less than 24% alcohol, with a flashpoint <60°C (<140°F).
   (a-2) A nonliquid capable under normal conditions of spontaneous and sustained combustion.
   (a-3) An ignitable compressed gas (per US Dept. of Transportation guidelines).
   (a-4) An oxidizer (per US Dept. of Transportation guidelines).

b) Corrosivity
   (b-1) An aqueous material with a pH ≤2, or, pH ≥ 12.5.

(b-2) A liquid capable of corroding steel at a rate >L1/4 inche per year at a temperature of 55°C (130°F)

c) Reactivity

(c.1.) A material that is normally unstable and reacts violently without detonating.
(c.2.) A material that reacts violently with water.
(c.3.) A material that can form an explosive mixture, capable of detonation with water.
(c.4.) A material that generates toxic gases, vapors or, fumes when mixed with water.
(c.5.) A material that contains cyanide or hydrogen sulfide and can generate toxic gases, vapors, or fumes when in solutions within the pH range of 2 to 12.5.
(c.6.) A material capable of detonation, if heated under confinement, or, subjected to a strong initiating source.
(c.7.) A material capable of detonation at standard temperature and pressure.
(c.8.) Listed in the DOT regulations as a Class A or B explosive.

d) Toxicity Characteristic Leachate

Materials listed in the Clean Water Act (e.g., hazardous metals, organics) with maximum allowable concentrations in drinking water are analyzed from samples of materials destined for disposal. Materials are subjected to leaching conditions typical of landfills (EPA SW-846). When a waste has leachate concentrations of exceed the maximum allowable concentrations under the test conditions, then the waste is considered hazardous and must be disposed of accordingly.

e) Excluded Materials

Certain materials are excluded from RCRA regulations:

1. Pesticides and agricultural wastes
2. Materials discharged to the atmosphere (Clean Air Act)
3. Materials discharged to water (including sewerage: Clean Water Act)

Medical and Infectious Wastes (medwastes) are regulated as a special category of hazardous wastes. These require alternative handling and disposal techniques that may be different from those utilized for hazardous wastes. Medical and infectious wastes are defined as:

1. *Cultures and stocks of infectious agents* (certain infectious agents require facility certification by USDA and FDA prior to their presence at a site under the Bioterrorism Act of 2002);

2. Human and animal tissue or pathological wastes (materials are comprised of either animal or human tissues, urine and fecal samples, or materials from humans or animals that contain a known pathogen);

3. *Used sharps* (these are items like syringes, scalpels, and broken glass that have been contaminated with human or animal tissues or fluids);

4. Wastes from pathogen infected animals;

5. Wastes from patients under isolation for communicable diseases; and

6. Unused sharps.

Treatment, Storage, and Disposal Facilities (TSDFs) are the locations of the ultimate waste disposal/destruction. TSDFs are permitted and strictly regulated by EPA according to RCRA regulations.

Transporter is the business or individual that conveys hazardous or medical wastes from a generator to a TSDF. Transporters are regulated and permitted by EPA according to RCRA regulations.

Cradle-to-grave tracking is an inventory system that tracks substances from their arrival at a facility to their ultimate disposition. This approach is mandated in RCRA as a means to identify sites of waste generation and implement waste minimization practices where practical.

Generator is a person, activity, or facility that creates a hazwate/medwaste stream which requires specialized disposal practices. In RCRA, there are several types of generators. The current classification of NMHU is as a:

> *Conditionally Exempt Small Quantity Generator* (CESQG). A facility that generates less than 100 kg of hazwaste per month, or less than 1 kg of “acutely hazwaste per month; or which accumulates less than 1000 kg at any one time, or less than 1 kg “acutely hazwaste” at any one time.
>
> CESQGs are not required to undertake a permit process like larger quantity generators. It is desirable for NMHU to maintain this status, because the processes and procedures involved with regulatory compliance at higher levels of generation are involved and costly

1. Hazardous Waste Management Responsibilities and Scope

1.1. Scope of Plan

The NMHU Waste Management Plan (NMHU WMP) is designed for University operations to comply with federal and state regulations (see http://www.epa.gov/ebtpages/wastes.html). RCRA regulations (40 CFR 260 series) requires that hazardous wastes are identified, isolated, transported, and ultimately disposed of in a manner that prevents waste discharges to the environment. Furthermore, regulations require an on-going program of waste minimization be in place at facilities.

This plan provides guidance to NMHU personnel involved with the generation, storage, transport and disposal of hazardous materials and wastes.

1.2. Responsibilities of Personnel

a) *On-site Generator* - The on-site generator is the person, or activity, that generates a hazardous waste on the campus. Laboratory and studio supervisors are the academic side on-site generators. Various Facilities Management units are also hazwaste generators. The person that supervises a facilities management unit is the on-site generator. The on-site generator is responsible for:

1. Maintaining adequate hazwaste/medwaste containers at the location where wastes are generated.
2. Ensuring hazwaste/medwaste containers are properly labeled.
3. Keeping incompatible hazardous wastes (e.g., solvent wastes, oxidizers, etc.) separate during generation and waste storage.
4. Supervising and training employees and students about the proper hazwaste/medwaste disposal procedures at the generation site.
5. Arranging for the removal of hazwaste/medwaste containers by the NMHU Hygiene Officer.

b) *Chemical/Biological Hygiene Officer* – This individual is responsible for:

1. The storage of hazwastes/medwastes prior to disposal.
2. The inspection of work areas for compliance with hazwaste/medwaste storage and labeling requirements.
3. Arranging for the appropriate disposal of hazwastes/medwastes.
4. Designing and maintaining the cradle-to-grave materials tracking inventory for the main-campus.

c) Vice-President for Administrative Services and Finance
The VPASF is responsible for ensuring that funds are available for annual disposal of hazardous wastes from all units. In 2003, this was in the range of $10,000 – 15,000. Moreover, the VPASF, or a designee, is the supervisor of the Chemical/Biological Hygiene Officer in regards to hazardous materials and hazwaste tracking.

d) NMHU President and Board
Ultimate responsibility for occupational health and safety and environmental protection lie with the President and Board of Regents at NMHU.

1.3 Ancillary NMHU Programs and Plans

Other NMHU Environmental Health and Safety plans that relate to this WMP are:

- Chemical Hygiene Plan for Laboratories and Studios
- Hazard Communication Plan
- Personnel Protective Equipment Plan
- Respiratory protection Plan
- Emergency Action Plan

2. Hazardous Waste Management Procedures

2.1 Overview

The following sections describe procedures for hazardous waste collection, storage, shipment, and disposal.

In general, the management process begins at the site of hazwaste generation; where hazwastes are separated according to the components and hazardous characteristics of a waste stream. This requires assessment of the waste stream(s) and the hazardous properties of wastes at a generation site. Segregation of wastes is important from two standpoints: (1) wastes that have mixed compositions are far more expensive to discard than segregated wastes, and (2) waste mixtures can lead to serious health and safety consequences when a fire or detonation occurs.

Hazwaste receptacles, with container inventory numbers, are conveniently located at each site of hazwaste generation. The containers are labeled with (1) "HAZARDOUS WASTE" in prominent letters, (2) the receptacle inventory number, (3) generator, (4) date of placement at location, (5) location of generation, and (6) the type or characteristic of waste that they receive.

Once receptacles are full, the on-site generator contacts the chemical/biological hygiene officer or a disposal company directly, for collection. For instance, small quantity wastes generated in laboratories and studios are collected by the Chemical/Biological Hygiene Officer for storage on campus until it is financially worthwhile to dispose of the waste. On the other hand, used motor oil may be picked up directly by an oil recycling firm from the motor pool. In either case, the locations of full containers are changed in the hazwaste receptacle database to reflect their change in location.

Hazwastes may only be transported by a permitted hazwaste transporter. Transporters must have an EPA ID number, which NMHU must verify. Often the transporter is also a TSDF. Each shipment of hazardous waste must be accompanied by a standard hazardous waste manifest, that lists the various materials in a shipment and designates a specific transporter and TSDF.

The ultimate disposal of hazwastes occurs at a TSDF. The TSDF must have an EPA ID number, which NMHU must verify.

2.2 Hazwaste Assessment

The hazardous properties of wastes generated from a laboratory, studio, facilities management operation, or other activities must be assessed. Material Safety Data Sheets (MSDSs; see NMHU Hazard Communication Plan) that accompany all initial shipments of pure and formulated chemicals can be used to identify hazards of

components of hazwaste streams. Hazwastes are assigned to a specific container type depending on their contents. The following briefly summarizes the general types of substances that must be segregated.

Waste Category (Type)	Components	Criteria
Metals	Silver, lead, mercury, cobalt, chromium, arsenic, uranium, cadmium, nickel, etc. as compounds in aqueous solutions or powder forms	Carcinogens, toxic at low doses, contribute to TCLP
Organic Solvents	Solvents with high flammabilities (see definitions section), or high toxicities	Carcinogens, mutagens, teratogens, highly toxic substances, high reactivity, high flammability.
Acids	Sulfuric acid, nitric acid, etc.	pH of resulting aqueous solution (if any) <2
Bases	Lye, calcium hydroxide, potassium hydroxide, quicklime (CaO), dimethylamine, etc.	pH of resulting aqueous solution (if any) >12.5

A standard assessment form is provided (see Appendix A) for listing and determining receptacle needs for a given facility/operation. Each time an operation or material is changed at a specific generation site a new assessment must be performed. The Chemical/Biological Hygiene Officer can assist in the assessment.

Generators are responsible for obtaining necessary storage containers. Containers shall be structurally sound, in good condition, and have a tight fitting cap. Stoppered bottles and plastic milk or soda bottles are not acceptable. A waste generator shall also assure that a container is compatible with the material to be stored. Materials that may generate vapor, such as solvents and other low boiling point materials, should be stored in a properly ventilated area (OSHA provides guidance on limits to storage of hazardous materials). All waste containers should have at least 10 to 20% headspace left in them to avoid pressure build up that may occur with expansion.

2.3 Hazwaste Receptacle Labeling

All containers shall be labeled with:

1. “HAZARDOUS WASTE” in a prominent type face;
2. Hazwaste container inventory number;
3. Category of Hazwaste;
4. Associated hazards (see NMHU Hazard Communication Plan for hazard warnings);
5. Name of on-site generator responsible for hazwaste at a location.

When a material has not been spent or otherwise altered, and has the original label in good condition on the original container, the original label will be sufficient.

When container size and configuration allow, the uniform waste label shown in Figure 1 should be used. If for some reason the uniform waste label cannot be used, the generator shall be sure to label the waste container with all of the information included in the uniform label. A material safety data sheet can often provide information necessary to label a container. *MSDS's shall be obtained and kept on file for each potentially hazardous material brought on campus.*

Figure 1. Uniform hazwaste receptacle label

HAZARDOUS WASTE

Inv#:
Hazards:

Type:

Location:
Generator:

Definition of terms for Uniform Hazwaste Receptable Label

Inv.# :	The waste receptacle's inventory number.
Hazards:	The type of hazards associated with the hazwaste, like flammable, corrosive, reactive, and health effects.
Type:	The type of contents in the container (e.g., metals, solvents, acids, bases, etc.).
Location:	The site where the hazwaste is accumulating.
Generator:	Person, activity, or facility that creates hazwaste stream which requires specialized disposal practices.

2.4 Storing Waste

All hazwastes shall be stored in a safe and secure area. Waste shall remain in such areas until picked up by the Chemical/Biological Hygiene Officer, or a representative of EHS. Never leave waste in a hallway or other unsecured area where it may be subject to public contact. Wastes should be properly segregated. Halogenated materials should be kept separate from non-halogenated and solids separated from liquids.

Generators are responsible for obtaining necessary storage containers. Containers shall be structurally sound, in good condition, and have a tight fitting cap. Stoppered bottles and plastic milk or soda bottles are not acceptable. A waste generator shall also assure that a container is compatible with the material to be stored. Materials that may

generate vapor, such as solvents and other low boiling point materials, should be stored in a properly ventilated area. All waste containers should have at least 10 to 20% headspace left in them to avoid pressure build up that may occur with expansion.

2.5 Hazwaste Transfer to EHS

Information must be provided to EHS to adequately characterize and dispose of the waste, prior to having it picked up. This information is provided by the on-site generator to EHS by using the Pickup Request Form (see Appendix B). Pickup requests shall be filled out and sent or faxed to EHS. Four to five days should be allowed for pickup.

EHS will evaluate the information in the pickup request form and if sufficient, will schedule the material for pickup. If insufficient, EHS will request additional information from the on-site generator. A pickup will not be made until appropriate information is received.

Certain wastes will require the generator to certify the presence or absence of constituents and concentrations. This certification can be based on the generator's knowledge, chemical testing, or other scientific data. EHS will notify generators when additional information or certification is necessary.

The generator, defined as Laboratory Supervisor, in making the certification, accepts the associated liability and responsibility for possible misrepresentation of the waste. Penalties for misrepresentation, a violation of state and federal law, can include fines and/or imprisonment.

When the generator does not have sufficient knowledge or information to make the certification, the wastes must be analyzed at the Department's (generator's) expense. The analysis must performed by a laboratory acceptable to EHS and be sufficient to provide necessary data for the on-site generator to certify the waste. EHS can provide guidance on appropriate analyses. A comprehensive analysis of an unknown waste can cost well over $1,000. It is therefore in the generator's and Department's best interest to maintain meticulous data concerning the waste and strict control over its composition.

3. Potentially Infectious Material Wastes

3.1 Definitions of Medical Wastes

Potentially Infectious Material (PIM) refers to materials that can be infectious to humans and other biological agents. The types of material are generated in connection with diagnosis, treatment (i.e., provision of medical services), or immunization of human beings *or animals*; medical research or the production or testing of biological agents.

Examples of potentially infectious materials include:

1. The following human body fluids: blood,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.
2. Any unfixed tissue, organ (other than intact skin), and body parts (except teeth and the contiguous structures of bone and gum) from a human (living or dead).
3. 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.
4. Cultures and stocks of agents infectious to humans, and associated biologicals; wastes from the production of biologicals; discarded live or attenuated vaccines; culture dishes and devices used to transfer, inoculate, or mix cultures.
5. Waste materials originating from animals inoculated during research, production of biologicals, or pharmaceutical testing with agents infectious to humans; carcasses, body parts, blood, or bedding of animals known to have been in contact with agents infectious to humans.

Regulated Medical Waste means liquid or semi-liquid blood or other potentially infectious materials and includes the following:

1. Contaminated items that would release blood or other potentially infectious material in a liquid or semi-liquid state if compressed.
2. Items that are caked with dried blood or potentially infectious material, and, are capable of releasing these materials during handling.
3. Contaminated sharps and unused needles or syringes.
4. Pathological and microbiological wastes containing blood or other potentially infectious material.

Non-Regulated Waste materials include:

1. Waste generated as general household waste.
2. Waste (except for sharps) for which the infectious potential has been eliminated by autoclaving.
3. Sharps that meet both of the following conditions:

a. The infectious potential has been eliminated from the sharps by autoclaving.
b. The sharps are placed in leak-proof, puncture-resistant containers.

3.2 Medwaste Containers

Medwastes will be placed into suitable containers. Medwaste containers shall bear the universal biohazard symbol (see Hazard Communication Plan). Containers can be plastic biohazard bags (orange) for most things except sharps, or, a commercially available sharps container. The containers shall be labeled with the label shown in Figure 2.

Figure 2. Uniform medwaste container label.

INFECTIOUS WASTE

Type:
Location:

Generator:

Definition of terms for uniform medwaste container label.

Type:	This is the type of contents in the container (e.g., tissues, cultures, sharps, etc.).
Location:	The site where the hazwaste is accumulating.
Generator:	Person, activity, or facility that creates medwaste stream which requires specialized disposal practices.

3.3 Medwaste Security

Regulated waste must be collected or secured at the end of each day by the on-site generators of the waste. If there is sufficient waste in the container at the end of the day, the container should be removed to the storage area. If the storage container is to be left in the use area, it must be secured so no other personnel can get into the material, or, any of the infectious material can contaminate any other material.

3.4 Medwaste Storage

The following are requirements for medwaste storage areas:

1. Store waste in a manner and location that provides protection from water, rain, and wind;
2. Maintain PIM in a nonputrescent state, using refrigeration when necessary, until disposal;

3. Lock storage areas to prevent unauthorized access;
4. Limit access to on-site storage areas to authorized employees;
5. Store medwastes in a manner that affords protection from animals and does not provide a breeding place or a food source for insects and rodents; and
6. If possible, store medwastes in an area with a drain and sill by the door, for easy cleanup and to prevent fluids from escaping the storage area.

4. Hazardous and Medical Wastes Disposal Procedures

It is critical that NMHU not exceed the storage thresholds mandated by RCRA. Consequently, monitoring of hazwastes/medwastes generation and storage is important to document, and, assure wastes are disposed of according to the regulations.
A Conditionally Exempt Small Quantity Generator (CESQG) is a facility that generates less than 100 kg of hazwaste per month, or less than 1 kg of "acutely hazwaste per month; or which accumulates less than 1000 kg at any one time, or less than 1 kg "acutely hazwaste" at any one time.

NMHU is currently classified as a CESQG. CESQGs are not required to undertake a permit process like larger quantity generators. It is desirable for NMHU to maintain this status, because the processes and procedures involved with regulatory compliance at higher levels of generation are involved and costly.

4.1 Permitted Transporters, and, Treatment, Storage and Disposal Facilities

Hazwaste transporters and TSDFs are required to undergo a permitting process with US EPA. Hazwastes may only be transported on public thoroughfares by a permitted transporter. The EPA Transporter Identification number must be obtained from a transporter at the time of contract bids, to verify that a transporter is authorized to convey hazwastes. Furthermore, a certification that the transporter has equipment approved to transport hazwastes by the US Department of Transportation (DOT).

TSDFs include hazwaste landfills, destruction units (e.g., incinerators, neutralization units, etc.), and chemical recycling and recovery facilities. TSDFs undergo an extensive permitting process with EPA, and are certified to accept only certain classes of wastes. The EPA TSDF Identification number must be obtained from a TSDF at the time of contract bids, to verify that a TSDF is authorized to accept hazwastes.

There are some TSDFs that also provide hazwaste transport. It is desirable for NMHU to contract with such a firm, because of greater control over material tracking and generally lower costs.

4.2 Hazwaste Manifests

RCRA regulations require that generators, transporters, and TSDFs utilize a standard Hazwaste manifest form (medwastes do not have the same requirements). The manifest includes:

1. NMHU's name, contact person, and address (generator);
2. Transporter's name, address, and EPA ID number;
3. TSDF's name, address, and EPA ID number;

4. A list of all containers and their contents (e.g., composition and quantity) with DOT codes and hazard warnings; and
5. A signed certification that the generator has a hazwaste minimization program.

There are 6 parts to the manifest:

1. TSDF's copy sent to generator
2. TSDF's copy sent to EPA or NMED
3. TSDF's copy
4. Transporter's copy
5. Generator's copy forwarded to EPA or NMED
6. Generator's copy

It is the responsibility of the generator to assure that hazwastes are actually delivered to a TSDF in a timely manner.

If a generator doesn't receive part 1 above in 35 days, then the generator must initiate a trace of the shipment and determine its whereabouts. After 45 days, the generator must notify EPA and NMED with an exception report that describes the tracing efforts and whereabouts of the waste. The Chemical/Biological Hygiene Officer is responsible for accounting for wastes shipped off-campus.

4.3 Medwaste Disposal Procedures

Potentially infectious material can be disposed of in one of several ways:

1. Rendering the material non-infectious by such means as autoclaving allows the material to be considered a non-regulated waste.
2. Totally destroying the material through incineration requires that each department collect the PIM in appropriate containers, store the material, and contact EHS to pickup the material for incineration in an EPA approved incinerator.

If PIM is to be rendered non-infectious by means of autoclaving the following shall be adhered to:

1. All autoclaving of PIM must be documented. This documentation should include the date, the person conducting the autoclaving, the material autoclaved, and the verification that the material was rendered non-infectious.

2. Verification that the autoclave reached the right temperature and pressure for the required amount of time is required. One way to do this is by autoclaving, along with the waste, a jar with spores in it. The jar is to be placed in the center of the waste bags, then if the spores are destroyed, it is likely that the infectious material has been rendered non-infectious. Once a week a spore test will be

required, all other times a heat/pressure tape is required to be placed on the bags.

3. All autoclaves that will be used for this type of work should also be inspected annually by a certified inspector. These inspections are to ensure that the autoclaves are capable of conducting the procedures they are being used for.

Under no circumstances are any sharps to be discarded into the general trash.

Large volumes of PIM, that cannot otherwise be treated as described above, must be transported by a EPA permitted medwastes transporter. Wastes must be packaged according to DOT regulations in containers that ensure no leakage of liquid contents, or emergence of sharps. Medwaste transporters are to provide their EPA Identification number at the time of bids for services. Medwaste transporters are certified by EPA to have vehicles and procedures for the safe transport of medwastes to disposal sites.

5. Materials Tracking and Inventory

Pure chemicals, and formulated chemical products, shall be entered into a campus-wide inventory and tracked from arrival on campus to their final disposition by an academic or facilities management unit. This tracking is mandated by RCRA regulations as the "cradle-to-grave" materials inventory requirement. This information is also of use in determining waste generation locations and the disposition of materials on campus. Certain units (e.g., Facilities Management, Natural Sciences, and Fine Arts) may maintain their own internal inventories that are linked to the global inventory, particularly when materials are dispersed throughout a building, or, across campus.

5.1. Database Information on Chemicals

Two databases will be maintained: 1) Formulated products, and, 2) Pure chemicals (drugs, reagents, etc.). Formulated products are mixtures of substances designed for specific uses. Formulated products include such items as cleansers, disinfectants, pesticides, paints, floor polish, etc. Pure chemicals are specific substances in either pure form or in a diluent (e.g. measurement standard with a chemical at a specific concentration in a solvent).

5.1.a. Formulated Product Information

1. *Container inventory number*: This is a number assigned sequentially to **each** container of formulated product when it arrives at Central Receiving. A barcode label with the inventory number is affixed to each container by Central Receiving.

2. *Name of Product*: The commercial or trade name of a formulated product. This is entered by Central Receiving when a product arrives on campus.

3. *Manufacturer/distributor*: The name of the outfit that sold and shipped the product to NMHU. Entered by Central Receiving.

4. *Hazards on shipping container or manifest:* US Department of Transportation maintains the Emergency Response Guidebook (ERG,http://hazmat.dot.gov/gydebook.htm). Chemicals and products shipped by any US carrier are assigned identification numbers that are used to find guidance on procedures from the ERG. In general, hazards of products should be on the label of the container, or, the outer container products were shipped within. The two greatest hazards are listed in this space. Entries include: flammable, explosive, corrosive, reactive, poison. This information is entered by Central Receiving.

5. *Material Safety Data Sheets (MSDSs) in records:* Employers are required to maintain a collection of MSDSs for all chemical products in use at a facility.

Furthermore, OSHA regulations require that MSDSs are readily available at the place of employment for any employee to peruse. This field is checked when an MSDS accompanies a shipment. Destination units are required to maintain a set of MSDSs for all substances in their possession.

6. *Consumer unit:* This is the academic or Facilities Management unit that the product is to be delivered to by Central Receiving. This is entered by Central Receiving.

7. *Consumer unit receipt*: The destination consumer unit of a product enters the date that the product was received by the unit. The consumer unit fills out this field.

8. *Consumer Storage location(s):* The destination unit enters the room number, or other designation for the location(s) product has been distributed to. For instance, cleansers are purchased by Facilities Management, Janitorial Dept. and then containers are dispersed to janitor's closets across campus. Consequently, container locations may be janitor's closets scattered through many buildings. The consumer unit fills out this field

9. *Disposition at consumer unit:* This is an indication of the final use that a product in a container was utilized for. This includes any notes on amounts of product disposed as waste (either nonhazardous or hazardous). This is entered by the consuming unit.

10. *Date of final consumption:* This is the date that all the contents of a container has been used, and the inventory number for tracking can be retired. This is entered by the consuming unit.

5.1.b Pure Chemical Product Information

1. *Container inventory number:* This is a number assigned sequentially to **each** container of pure chemical when it arrives at Central Receiving. A barcode label with the inventory number is affixed to each container by Central Receiving.

2. *Chemical Name:* This is the scientific chemical name that will be provided on invoices of pure chemicals. Central Receiving enters this name

3. *CAS Registry number:* CAS refers to the Chemical Abstract Service of the American Chemical Society. CAS assigns a registration number for each new substance reported in the literature. The number should be on the MSDS or invoice of a pure chemical. Central Receiving enters this number.

4. *Manufacturer/distributor:* The name of the outfit that sold and shipped the pure chemical to NMHU. Entered by Central Receiving.

5. *Hazards on container label:* US Department of Transportation maintains the Emergency Response Guidebook (ERG, http://hazmat.dot.gov/gydebook.htm). Chemicals shipped by any US carrier are assigned identification numbers that are used to find guidance on procedures from the ERG. In general, hazards of chemicals should be on the label of the container, or, the outer container chemicals were shipped within. The two greatest hazards are listed in this database field. Entries include: flammable, explosive, corrosive, reactive, poison. This information is entered by Central Receiving.

6. *MSDS in records:* Employers are required to maintain a collection of MSDSs for all chemical products in use at a facility. Furthermore, OSHA regulations require that MSDSs are readily available at the place of employment for any employee to peruse. This field is checked when an MSDS accompanies a shipment. Destination units are required to maintain a set of MSDSs for all substances in their possession.

7. *Consumer unit:* This is the academic or Facilities Management unit that the product is to be delivered to by Central Receiving. This is entered by Central Receiving.

8. *Consumer unit receipt:* The destination consumer unit of a pure chemical enters the date that the product was received by the unit. The consumer unit fills out this field.

9. *Consumer Storage location(s):* The destination unit enters the room number, or other designation for the location(s) a chemical container has been distributed to. For instance, cleansers are purchased by Facilities Management, Janitorial Dept. and then containers are dispersed to janitor's closets across campus. Consequently, container locations may be janitor's closets scattered through many buildings. The consumer unit fills out this field

10. *Disposition at consumer unit:* This is an indication of the final use that a product in a container was utilized for. This includes any notes on amounts of product disposed as waste (either nonhazardous or hazardous). This is entered by the consuming unit.

11. *Date of final consumption:* This is the date that all the contents of a container has been used, and the inventory number for tracking can be retired. This is entered by the consuming unit.

5.2 Central Receiving

The role of Central Receiving in materials tracking is to document the arrival of substances in the database, and, to place an inventory label on each individual container of chemicals (e.g., each bottle in a case box) before the transport of the substances to other campus locations. Central Receiving enters the following information into the database:

a) Container inventory number
b) For formulated products
    (b.1.) Product name
    (b.2.) Manufacturer

c) For pure chemicals
    (c.1.) Chemical name
    (c.2.) CAS Registry number (if available)
    (c.3.) Manufacturer
d) Hazards on shipping container or manifest
e) MSDS check
f) Consumer unit

In many instances, there may be short-term storage of chemical-containing parcels at Central Receiving. Central Receiving therefore must comply with OSHA chemical storage requirements (OSHA 29 CFR 1910.106). In short, flammable liquids must be kept in a separate room or cabinet from strong acids and bases, and strong oxidizers. Furthermore, drugs and certain biological materials must be kept in a locked location, with restrictions on personnel access.

5.3 Consumer Unit

The consumer unit is the Facilities Management Department, or academic unit that receives a chemical or formulated product shipment. The consumer unit is responsible for:

1. Entering the consumer receipt field in the chemical database.

2. Providing a safe and secure storage location suitable for the type of substances being stored. Guidance on OSHA's regulations on storage of materials can be found at (OSHA 29 CFR 1910.106). The storage location shall be entered into the appropriate database field by the consumer unit

3. Disposition of the material by the consumer unit is entered by the consumer unit. This is the use of the chemical or product that the chemical was put to.

4. Date of final consumption is entered by the consumer unit.

5.4 Annual Review of the Database

The Campus Safety Officer shall annually review the database for consistency and completeness. Containers of chemicals at various campus locations will be inspected for appropriate inventory numbers and hazard warnings. Containers that cannot be found but are still listed on the inventory, shall be traced and the location or disposition of the container entered into the database by the consumer unit.

6. Waste Minimization

Waste minimization is the process of identification and implementation of ways to reduce the generation of solid and hazardous wastes from normal operations. Typically waste minimization is achieved by:

1. Change in process to reduce the volume of hazardous waste materials.

2. Substituting less hazardous materials for materials that must be disposed of as hazardous wastes.

3. Reducing the quantities of hazardous substances that lead to hazwastes utilized in processes.

4. Internal recycling of certain materials (e.g., solvents that can be recovered and purified, metal recovery by precipitation from aqueous solutions, etc.).

Two approaches can be taken in waste minimization:

a) Monitor hazardous waste production by units across campus to identify generation points that could have operations modified to reduce waste volumes.
b) Proactively identify, at the beginning of a project, means to reduce hazardous waste generation.

6.1 Monitoring Hazwaste Generation

The EHS Committee shall annually review the results of the inventory inspection and hazwaste generation levels reported from the hazwaste inventory. Campus units identified as generating large quantities of hazwastes will be asked to prepare a justification for the quantity generated; and plans for minimization of waste volumes. However, waste minimization may not be feasible in certain situations, and the committee will take this into consideration.

On-site generators that are identified as not segregating wastes correctly, from analytical reports by the transporter or TSDF, will be requested to change their hazwaste disposal procedures at the generation site. This can be done with assistance from the Chemical/Biological Hygiene Officer.

6.2 Estimating Hazwastes and Prescribing Hazwaste Minimization

The Hazwaste volume assessment form can be used to estimate the types of hazwastes that are likely to be produced from a research, construction, or other project. It is understood that this is difficult to do precisely in many instances, however, the utility lies in determining ways that hazwastes generation could be reduced during the operation.

7. Training

7.1 General Training of Personnel

All faculty, students, and staff that routinely handle hazardous materials or potentially infectious materials shall be trained in the hazwastes/medwastes handling and disposal procedures for the unit they work within. Faculty will be trained by the Chemical/Biological Hygiene Officer in appropriate hazwastes/medwastes disposal procedures for their specific classes, projects, and research. Laboratory and studio supervisors are responsible for assuring that personnel in their workspaces dispose of hazwastes/medwastes correctly. Consequently, students in classes, and those working on special projects must receive an appropriate level of training by the laboratory or studio supervisor. Facilities Management department supervisors are responsible for providing training to employees in their units.

A record of the training with the employees signature must be kept on file by the employees supervisor. In laboratories and studios, the waste management training can be incorporated as part of the training to comply with the chemical hygiene plan.

8. Recordkeeping

8.1 Hazardous Waste Manifests

The standard hazardous waste manifest pages shall be kept on file by the Campus Safety Officer for a minimum of 3 years.

8.2 Hazardous Waste Assessment Forms

These forms shall be kept by the Chemical/Biological Hygiene Officer, until a process or operation at a location changes. When there is a change in project, operation, or process at a location a new assessment shall be completed and review by the Chemical/Biological Hygiene Officer.

8.3 Hazwaste Pickup Forms

Pickup forms are to be retained by the Campus Safety Officer with the manifest from a hazwaste shipment. These shall be kept on file for 3 years.

8.4 Training Records

Records of training shall be kept with the Chemical Hygiene Plan for a laboratory or studio. Training records in Facilities Management units will be kept by the Director of Facilities Management. Furthermore, a copy of the records shall be sent to the Campus Safety Officer for filing. Records of training must be retained for a minimum of 3 years, or, the duration of a specific project.

Appendix A: Hazwaste Assessment Form

This form is to be used to assess the hazardous properties of waste streams from operations.

The following are directions for each entry.

Academic/Facilities Unit – This is the academic department/discipline, or, facilities management department that is generating the waste.

Date - The date of the assessment.

Page ___ of ____ - This is to keep track of the pages of the form needed for an assessment.

Location: Building – Enter the name of the building and Room # in which hazwastes are generated.

On-site Generator – Enter the name of the person who is responsible for the hazwastes at the generation location. This is the laboratory or studio supervisor as described in the NMHU Chemical Hygiene Plan, or, the departmental supervisor in Facilities Management.

Operations/Project – For this field, enter the name of the class(es), activity, or research project(s) from which the waste is generated.

Waste Material Source/Activity/Description – This is a name or descriptor of a waste material that is commonly disposed of.

Chemical components – List the chemicals that are in a waste stream. Only components that exceed 1% of the waste volume need be listed. If uncertain about the quantity of a chemical in a waste mix, then list the chemical. This will be a main means of determining the hazardous properties of a waste stream.

Waste Volume (weight or volume) Production Rate – This is the amount of material generated over time, either in weight units (e.g., pounds, kilograms, etc.), or volume units (e.g., quart, liter, etc.).

Ignitable – If a waste meets the criteria for ignitable (see definitions) then check this box.

Reactive - If a waste meets the criteria for reactivity (see definitions) then check this box.

Corrosive - If a waste meets the criteria for reactivity (see definitions) then check this box.

NMHU Hazardous Waste Assessment Form Rev. 1.0 (Draft 3/22/04 KPB)

Academic/Facilities Unit:_____ **Date:**_____ Page ___ of ____

Location: Building:_____ Room #:_____ **On-site Generator**:_____

Operations/Project:_____

Waste Material Source/Activity/ Description	Chemical components	Waste Volume (weight or volume) Production Rate	Ignitable	Reactive	Corrosive	Carcinogen /Mutagen/ Teratogen	High Toxicity

Appendix B. Pickup Request Form

Directions for completing each entry in the Pickup Request Form

Requesting Unit -

Supervisor –

Date - Date completing form.

Building/Room - Enter the name of the building and Room # where hazmate material are to be picked up.

Container # -

Chemical Composition

Container Size/Type -

Pick up by/date -

NMHU Hazwastes Pickup Request Form

Requesting Unit:_____ Supervisor:_____

Date:_____ Building/Room:_____

Container #	Chemical Composition	Container Size/Type	Pickup by/date