MONTCLAIR STATE UNIVERSITY

HAZARDOUS WASTE PLAN

Purpose

The purpose of this manual is to provide important information for Montclair State University personnel concerning management of hazardous wastes, which include chemical, biological, medical and radioactive waste generated at the University.

Proper chemical waste management is important in order to provide safe working situations for faculty, staff and students, to protect the environment, and to ensure our compliance with all applicable federal, state and local laws and regulations.

Environmental Laws and Regulations

In 1976, Congress enacted the Resource Conservation and Recovery Act (RCRA) to protect human health and the environment from improper chemical hazardous waste management practices. This legislation required each waste generator to obtain an EPA identification number for its activities that occurred within a continuous area. RCRA regulations also exempted two categories of small quantity generators from many of the hazardous waste regulations: these are the Conditionally Exempt Small Quantity Generator (CESQG) and the Small Quantity Generator (SQG). Montclair State University has one EPA number for its area which is defined as a SQG. This means that MSU must follow the regulations for SQGs. Under RCRA, a small quantity generator is defined as an entity which produces less than 1000 Kilograms but more than 100 Kilograms per month of hazardous waste and/or less than 1 Kilogram per month of acutely hazardous waste. .MSU also comes under other environmental laws and regulations, including the Toxic substances Control Act (TSCA), Superfund Amendments and Reauthorization Act (SARA), Clean Water Act (CWA), Clean Air Act (CAA), Emergency Planning and Community Right-to-Know Act (EPCRA), and New Jersey General Safety Code One. Thus, it is very important to not discard as ordinary trash any reagents, chemical solutions, chemical mixtures, industrial products, or any items containing substances which may be regulated under one or more of these programs.

Regulated Non-Hazardous Wastes

Under the Resource Conservation and Recovery Act (RCRA), all solid biological and chemical wastes and discarded liquids and gases in containers (like ingredients of discarded aerosol cans) must be disposed in a manner that will prevent pollution of the environment (usually, significant degradation of water quality, or visual and physical pollution of the land). Non-hazardous waste is all waste that can fall into this classification which is not specifically designated a hazardous

waste by name because of its chemical and physical properties. These regulated non-hazardous wastes may be generated without registration or a permit, but are subject to specific prohibitions on treatment and disposal. They must be disposed only at facilities having a permit to treat and dispose of wastes, such as a sanitary landfill. On-site treatment and disposal of non-hazardous waste without a permit is prohibited. Exceptions are made for sanitary wastes discharged to wastewater treatment systems. Such discharges are regulated under the federal Clean Water Act.

WASTE HANDLING OPERATIONS, TREATMENT AND DISPOSAL

Hazardous Waste Definition

Hazardous waste material comes from many sectors of our technological society -industry, hospitals, research laboratories, and all levels of government. The US Environmental Protection Agency and the New Jersey Department of Environmental Protection are authorized to regulate all aspects of hazardous waste management including generation, storage, treatment, disposal, and transportation. These agencies define a hazardous waste as a solid waste that may cause or significantly contribute to serious illness or death, or that may pose a substantial threat to human health or the environment if managed improperly. Solid waste includes liquids, semisolids, and compressed gases. The EPA has expanded the definition of a hazardous waste to mean a solid waste that is not excluded from regulation and that:

a. Exhibits one or more of the characteristics of a hazardous waste, such as ignitability, corrosivity, reactivity or toxicity.

b. Is listed in 40 CFR 261 as a hazardous waste.

c. Is a mixture of solid waste and one or more of the listed (40 CFR 261) hazardous wastes.

d. Is disposed of, burned or incinerated; or accumulated, stored, or treated (not recycled) before burning or disposal.

e. Is recycled in a manner constituting disposal, burned to recover energy or to produce a fuel, or accumulated speculatively.

Characteristics of Hazardous Wastes and Special Wastes

The characteristics for identifying a hazardous waste are ignitability, corrosivity, reactivity, and toxicity. Infectivity, and radioactivity are characteristics of special wastes. Any waste that exhibits any of these characteristics is considered to be a hazardous or special waste, whether or not it is listed by the EPA or NJDEP.

a. Ignitable - This characteristic identifies a waste that may cause a fire during routine waste disposal and storage conditions. There are several ways to identify ignitable wastes, depending on whether the waste is liquid, solid, or compressed gas. A waste is ignitable if:

- It is a liquid other than an aqueous solution containing less than 24 percent alcohol by volume that has a flash point of 140 degrees Fahrenheit (60C) or less.

- It is not a liquid and is capable of causing a fire at standard temperature or pressure through friction, absorption of moisture, or spontaneous chemical changes.

- It is a compressed gas classified as flammable by the Department of Transportation. DOT's definition of flammable is a material that has a flash point below 100 degrees Fahrenheit.

- It is an oxidizer as defined by the Department of Transportation. An oxidizer is defined as a material that yields oxygen readily and stimulates the combustion of organic materials. Examples are chlorates, nitrates, permanganates, or organic peroxides.

b. Corrosivity - This characteristic identifies a waste that is a liquid or solid that may cause visible destruction or irreversible alteration on human skin, or a liquid that has a severe corrosion rate on steel. A waste is corrosive if:

- It is a liquid and has a pH of less than or equal to 2.5 or a pH greater than 12.5.

- It is a solid and has an aqueous solution pH of less than or equal to 2.5 or a pH greater than 12.5.

c. Reactivity - This characteristic identifies a waste that is a liquid, solid, or gas that produces dangerous gases and/or fire when mixed with air, water or pH changes. A waste is reactive if:

- It reacts violently with water or air.
- It forms potentially explosive mixtures with water or air.
- It contains cyanide or sulfide-bearing wastes that, when exposed to pH conditions between 2 and 12.5, can generate sufficient toxic gases, vapors, or fumes to pose a danger to human health or the environment.
- It is capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

d. Toxicity - This characteristics identifies a waste that is a liquid, solid or gas that can have an acute or chronic effect on human health or the environment.

e. Infectious - This characteristic identifies that portion of Potentially Infectious Biomedical Waste (PIBW) which contains pathogens with sufficient virulence and quantity that exposure to the waste by a susceptible host could result in an infectious disease. Potentially Infectious Biomedical Waste (PIBW) includes medical waste and infectious waste. Waste considered likely to be infectious by virtue of what it is or how it may have been generated in the context of health care or health care like activities. It includes but is not limited to the following:

- Human blood, human blood products, blood collection bags, tubes, and vials.
- Sharps used or generated in health care or laboratory settings.
- Sharps include glass fragments, needles, syringes, scalpels, scalpel blades, pipettes and other medical instruments or laboratory waste capable of puncturing or lacerating skin.
- Bandages, diapers, "blue pads," and other disposable materials IF they have covered infected wounds or have been contaminated by patients isolated to protect others from the spread of infectious diseases.
- Any other refuse that has been mingled with Potentially Infectious Biomedical Waste.

f. Radioactive - This characteristic identifies a waste that is capable of emitting alpha, beta, or gamma rays of radioactivity. Radioactive waste must be disposed of according to the guidelines in the University Radiation Plan.

g. Specialty Wastes - These wastes are identified by the special problems they impose for storage and disposal. A specialty waste is:

- A waste that is a combination of two or more of the above wastes (such as an infectious waste that is contaminated with a radioactive isotope).
- PCB (polychlorinated biphenyls).
- Reactive metals (such as sodium which is water reactive and also a flammable solid).
- Gas Cylinders (such as lecture bottles and acetylene bottles).

PROCEDURES FOR HANDLING WASTE

Handling Radioactive Wastes

Wastes containing low level radioactive contamination can be retained until they decay to background radiation levels as indicated by obtaining a background level reading with a survey meter. This requires that the waste be kept in a locked, shielded enclosure. Such an enclosure may be located in only one room of an operating unit and can be relatively small. It is the responsibility of the person who generates radioactive waste to separate it from regular solid and chemical waste to avoid contamination. The waste contaminated with radiation should be immediately sealed, labeled and taken to the proper storage area. Shielded garments, glove boxes and radioactive material fumehoods as specified by the EH&S Radiation Safety Officer should be used during containment.

Radioactive waste containers must be clearly labeled with radiation markings showing each radioisotope present, quantity and types of material in the container, the date the waste was generated, and name of the licensed user. It is important that the person generating the waste be as specific as possible about the chemical and biological constituents of the waste. The material in the waste mixture, especially carrier solutions or excipients, may be regulated material which EH&S office is responsible for properly disposing. Exceptions to these regulation-mandated packaging and labeling procedures, such as the handling of excreta for animals receiving radioisotope injections, are usually presented in the EH&S Radiation Safety Plan.

Handling Biological Wastes

All discarded items known or suspected of containing a potentially infectious biological waste should be handled as a biohazard. Wastes containing a biohazard should be sealed in an impervious (red) bag, marked with a biohazard label and placed in covered receptacles marked with the words "Biohazard Waste" and with the biohazard symbol. Handling of these wastes should be conducted according to OSHA's "Universal Precautions and Blood-borne Pathogens" regulations. Biohazards contaminated with radioactive wastes should be sealed, labeled and disposed of in accordance with the EH&S Radiation Plan.

Handling Chemical and Biological Mixtures

Discarded mixtures which contain chemical and biohazards must be handled with precautions appropriate to the dangers present and marked with both chemical and biohazard warning labels. Biohazards in chemical wastes can be destroyed by the use of disinfectants and rarely, by sterilizing the mixture. Following any infection destruction procedure, the person treating the waste must seal the residuals in the proper container and apply to it the appropriate label, identifying its chemical components.

Handling Hazardous Materials

Hazardous materials are the active constituents of many commercial products used by the faculty, staff and students of the university. Hazardous materials are knowingly used for their unique chemical or physical properties in campus workshops, teaching and research laboratories. Properly marking for disposal spent, used, or aged chemicals, discarded or aged products containing hazardous materials as their active ingredients, or the by-products of using these hazardous materials or products is the legal responsibility of the generator. Such wastes must be handled according to all federal, state and local laws and policies set forth by EH&S office.

Handling Lab Wastes

Solid hazardous wastes in teaching and research labs, should be placed in sturdy containers and properly labeled. When breakable containers are used, they should be placed in carriers. As with solid hazardous wastes, liquid wastes should be placed in containers provided for that purpose. Liquid wastes of a common chemical composition may be generated continuously in teaching and research labs. Regulated waste from these activities may not be poured down the drain unless with the written consent of EH&S office.

Untreated wastes must be properly contained and labeled for disposal by EH&S office. If vented safety cabinets for storage of compatible wastes are provided, the daily accumulation of mixtures may be temporarily stored. When these waste containers are full, they are to be disposed according to EH&S office policies and procedures pertaining to hazardous wastes.

When hazardous wastes are generated during an experiment as process in a lab, the material may be reduced to a non-hazardous material by the person conducting the procedure or process, as the last step in the experimental procedure or process. Primary neutralization is an example of this. The now, non-hazardous waste can be disposed as regular waste.

HOW TO DETOXIFY LAB WASTES

Chemicals

Some hazardous wastes generated in universities can be treated or reduced in toxicity if there are approved methods for such treatment. The following methods of reducing the amount of waste should be done with the consent of the EH&S office:

- Acids and Bases: All acids that are 15% or less should be neutralized by adding a 30% solution of sodium bicarbonate to the acid slowly until a range of 5-8 pH is reached. The mixture can be poured down the drain with an excess of water.

- All bases that are 15% or less should be neutralized by adding a 5% solution of sulfuric acid to the base slowly until a range of 5-8 pH is reached. The mixture can be poured down the drain with an excess of water.

- Aldehydes and Peracids All aldehydes or peracids that are 20% or less should be treated with excess sodium bisulfite solutions and then neutralized. The resulting mixtures can be poured down the drain with excess water.

- Mercaptans and Nitriles All mercaptans and nitriles that are 15% or less should be oxidized with a 15% solution of hypochlorite (bleach). Neutralize the resulting mixture, then discard down the drain with excess water.

These methods can be done on a limited basis as long as the generator has prior approval of the EH&S office.

Procedures

In order for EH&S office to provide technical assistance with and recommendations for disposal of hazardous wastes, information concerning the materials must be obtained:

- The full name of the chemical must be properly marked on the container and the container must be properly sealed.

- List the full name of each chemical to be discarded; do not abbreviate names. If only a trade name is given, list the trade name, any descriptive material on the label, and the vendor and/or manufacturer's name and address. EH&S office will assist in obtaining contents information from

the vendor or manufacturer. The disposal options available depend upon the nature of the hazard(s) of the materials being discarded. Every effort is made to properly and economically dispose of unwanted chemicals in a safe and proper manner, considering safety aspects as well as regulatory requirements.

1. No hazardous materials, toxic or flammable, are to be discharged into the drains or put into the trash. Arrangements should be made with EH&S to dispose of all toxic, flammable, or otherwise hazardous chemicals and reagents which are no longer needed or wanted.

2. Waste containers should be compatible with the waste material, i.e. non-reactive with that waste, and wastes should be stored until pickup of the materials can be arranged with EH&S. Special containers with self-closing covers should be used for volatile liquids and spent chemicals.

3. Alkalis and acids must be between the pH of 5.5 and 10.0 in order to be disposed via the drains with copious amounts of water.

4. Handle all materials carefully. Many hazardous materials can deteriorate over a period of time and cause more harm than the original material. Do not open containers to determine the quantity of the contents; loosening a lid or cap could cause serious harm to health or the environment.

5. Likewise, avoid jarring or shaking containers. Wear proper clothing when handling hazardous materials. (Material Safety Data Sheets can be a good source for information on handling hazardous materials.)

6. All containers must be clearly labeled as to contents and dated. For unknown materials, make every effort to identify the contents of the container. Commercial disposal firms do not accept unknowns, and EH&S office cannot offer valid assistance without some knowledge of the nature of the materials. If possible, contact the person(s) who generated the waste to obtain knowledge of the material. A physical description such as solid, liquid, pH, odor or flammability could be helpful.

7. Gas cylinders should be returned to the vendor when gas has been expired and should be handled according to NFPA rules. Since rental on most cylinders involves monthly charges, empty or unwanted cylinders should be returned as soon as possible to the vendor. The Purchasing Office usually can offer assistance with return of cylinders. Gas cylinders cannot be accepted by commercial firms; arrangements for disposal through other sources are scarce and extremely expensive.

8. Any unwanted experimental pesticides should be returned to the manufacturer.

9. Radioactive waste will be handled by the methods allowed by Radiation Safety Regulations (see Radiation Safety plan).

10. Biological or infectious material should be handled in strict accordance to sanitary codes and rendered non-recognizable and non-infectious by using methods such as red bagging, sterilization, autoclaving and incineration of wastes. All infectious waste is to be sterilized prior to disposal or packaged properly for immediate incineration. No untreated infectious waste is to be discarded into solid waste (normal trash) containers for disposal.

Hazardous Waste Disposal

Generators are those who produce or accumulate and dispose of over 1,000 kilograms (2200 lbs) of hazardous waste in a month's time. Montclair State University is classified as a generator because we produce more than 1000 kilograms of hazardous wastes a month, store the wastes for up to 90 days, and don't treat acutely hazardous wastes on-site. MSU is not authorized to treat, store (for more than 90 days), or dispose of hazardous wastes on-site due to the restrictive nature of the hazardous waste regulations.

The Resource Conservation and Recovery Act authorizes the Environmental Protection Agency to set standards for generators of hazardous wastes. Under these standards, the generator must:

1. Notify EPA if hazardous waste is generated.

2. Prepare and follow-up a manifest for off-site shipments.

3. Make sure shipments reach the designated facility.

4. Package, label, mark and placard properly.

5. Keep records and submit reports.

EH&S office encourages the recycling of unwanted chemicals to others within the University who can use the material. Every effort should be made to verify that no other use can be found for the unwanted materials. For example, lists of unwanted chemicals can be distributed within a department, or EH&S may know of someone who could use the material. Anyone wishing to claim the material may do so at no cost. Because of the costs and efforts involved in typical waste disposal, recycling is an attractive alternative in many cases.

Redistillation as a method to reuse some solvents is also encouraged. Large volume solvent users may find distillation to be a suitable method of reusing materials and reducing disposal costs. Also, methods of volume reduction to concentrate wastes should be pursued by those generating the waste.

HAZARDOUS WASTE CATAGORIES AND DEFINITIONS

Any material which is to be discarded, abandoned, or accumulated prior to recycling is considered a waste. Some major categories of hazardous chemicals and potentially hazardous waste are listed below, including examples. If you are uncertain about a particular waste, please contact the EH&S office at X4367.

Unknowns

Perhaps the most expensive and time-consuming group of potentially hazardous chemical waste is the unknown. If no identity can be assigned to a chemical or chemical mixture, or it cannot be determined by process knowledge, the unknown must be subjected to analytical procedures that can cost MSU many hundreds or even thousands of dollars, and take several weeks to complete. Most unknowns can be avoided by using standard laboratory protocol: Label each container as to its content, date received or prepared, concentration, and the initials of the preparer. If the chemical is a commercial preparation, please make every attempt to contact the original manufacturer and obtain MSDS sheets for the material. This could save the university much time and money.

Unknowns should NOT be placed in storage or transported to the TAA until an analysis of the unknown has been completed. DO NOT LEAVE ANY CHEMICALS AT THE TAA WITHOUT FIRST OBTAINING APPROVAL FROM TSO PERSONNEL !!

Exposure of certain chemicals to weather extremes can create dangers of fire, explosion, or container rupture and subsequent expensive cleanup activities along with an environmental contamination potential.

Abandoned Chemicals

Chemicals that have been abandoned, or for which ownership cannot be identified, may be hazardous waste. If the identity of the material is not known, treat it according to the instructions for an unknown listed above. If the chemical identity is known, and is abandoned because of other actions or activities, notify the EH&S at X4367 for characterization and pick-up.

Unknown or Questionable Purity

Chemicals with unknown or questionable purity cannot be expected to be used in either a teaching or research capacity. While some of these chemicals may be hazardous waste once they are characterized, others often are not, but still must be disposed of properly. The EH&S office will assist individuals with this task to ensure safe and environmentally sound disposal practices.

Expiration Date Surpassed

Some chemicals have specified expiration dates which must be observed for safety and regulatory reasons. For example, peroxidizable chemicals, some which are listed in Appendix A, have expiration dates which should not be exceeded under any circumstances. In addition, manufacturers often supply expiration dates on labels of chemicals that are related to potency or even compositional changes that occur with time. These dates should always be observed, and if they are exceeded, the chemical declared a waste. Please contact the EH&S office for information about chemicals which are in this category.

Chemicals From Discontinued or Completed Activities

When these materials are no longer useful, they may be considered waste. However, another possibility is to recycle them by identification through the Hazardous Material Tracking Program inventory system. Each material manager or laboratory supervisor should attempt to determine whether a chemical they need is available elsewhere on the campus before buying more from an outside vendor. This will help reduce the financial burden on both initial cost and ultimate disposal cost when it is eventually declared a waste. Some examples of these kinds of activities include:

1) a PI leaves the University

2) lab work on specific projects is completed

3) the responsibility for a lab or work area changes. Please consult with the EH&S at X4367 concerning the fate of these chemicals and the procedures to be followed to ensure proper closure of a laboratory or program within the lab.

Excess Material Stock

Excess stock with no likelihood of use either by their current owners, the department, or others elsewhere on the campus, is considered waste. Careful planning when purchasing chemicals can reduce the volume of excess chemicals that must ultimately be managed as hazardous waste

Spent Cleaning and Wash Solvents

Spent cleaning and wash solvents are almost always considered hazardous waste, because

either the solvent itself or the materials which contaminate the solvent are considered hazardous. Spent solvents from automobile, diesel, aircraft, or other parts washers are currently recycled

under a monitored program. Other generators of spent solvents should contact the EH&S at X4367 for waste solvent management options.

Waste Paints and Stains

Waste paints and stains which contain hazardous metals such as lead or chromium, or hazardous solvents which may be flammable, must be considered hazardous waste. Old paint cans which have hardened contents must also be presented for proper disposal. Most water-based latex paints currently are not considered to be hazardous, but may not be acceptable to a RCRA Subtitle D landfill. Please consult the EH&S at X4367 for proper disposal information.

Motor Oil and Filters

Regulation on used motor oil and filters are subject to change. Currently, oil is recycled, but properly drained filters are not. The State of New Jersey regulates these items. If you have questions concerning either the regulatory status or recycling options, contact the EH&S office at X4367.

Mercury

Metallic mercury is commonly found in calibration instrumentation such as thermostats, thermometers, and barametric pressure equipment. Bulk quantities of metallic mercury or mercury sulphide can usually be recycled, but articles contaminated with mercury or its compounds must be disposed of as hazardous waste. The cost of recycling metallic mercury is not excessive at this time, and the TSO has collection containers for that specific use. However, cleanup of a mercury spill from a broken thermometer generates large quantities of mercury waste, which is very costly to dispose of. For the University, it is far less expensive to obtain an electronic thermometer than to pay disposal costs of a broken mercury thermometer. Do not buy any new mercury-containing equipment for use at the university.

Mercury compounds are currently very expensive to dispose of. Every attempt to find alternatives to using mercury compounds should be made, as the cost per gram of disposal is approximately 50-200 times the purchase cost!! Do NOT buy mercury compounds if you can find acceptable alternatives. If you have mercury compounds to dispose of, consider sulphide precipitation as a final step in your process. Currently, mercury sulphide is the only mercury compound which is accepted for recycling.

Electrical Transformers

Older electrical transformers often contain PCB dielectric oils. In the past, great expense has been incurred in testing for and disposing of these fluids from equipment that has been donated to the university. DO NOT ACCEPT DONATED ELECTRICAL EQUIPMENT UNTIL IT HAS

BEEN EVALUATED BY EH&S PERSONNEL FOR HAZARDOUS MATERIALS!! The cost to dispose of contaminated donated equipment is very high and does not need to be incurred if properly evaluated prior to acceptance of the item.

Fluorescent Light Bulbs

Older fluorescent light bulbs (pre-1978) usually contain PCB oils as dielectric fluids in capacitors inside the ballast. These bulbs must be disposed of as hazardous waste under TSCA and RCRA Subtitle D regulations. In addition, if a ballast shows any signs of leakage without being opened, it must also be disposed of as hazardous waste, whether it contains PCB oils or not. All bulbs should be brought to the Physical Plant, where barrels are located for their storage. EH&S personnel will sort them for proper disposal.

Donated or "Free" Chemicals

MSU could potentially spend thousands of dollars on "free" chemicals donated to the university, which ultimately would have to be disposed of as hazardous waste. Do not accept any donated chemicals from any outside source without first consulting with the EH&S. Accepting any "free" chemicals may result in additional expense incurred to dispose of these items properly.

Electrical Batteries

Lead-Acid Batteries

These items contain both corrosive and toxic compounds and lead, which are regulated under RCRA and TSCA. Lead-acid batteries can be recycled and should be taken to: Batteries are no longer accepted at the landfill. Contact EH&S personnel at X4367 if you need assistance.

Mercury Batteries

Some special purpose battery packets contain mercury and mercury compounds, and cannot be disposed of as normal waste or refuse. These items are normally marked as containing mercury, and should be disposed of or recycled as hazardous waste. Please contact EH&S personnel for assistance with these items.

Lithium (Li) Batteries

These batteries are designed to be returned to the supplier, and should not be disposed of in normal trash. Special requirements for shipping also exist, including documentation from the

supplier. If you have lithium batteries to return to the vendor, please contact either your department material handler or the EH&S at X4367 for assistance.

Nickel-Cadmium (Ni-Cd) Batteries

These rechargeable batteries should be disposed of as hazardous waste when they can no longer be recharged, or when they begin to leak. The cadmium in them is listed as a suspected carcinogen, and must be disposed of as regulated waste when generated by MSU.

Photographic and Radiographic Solutions

Spent chemicals used in developing x-ray films and black-and-white photographic negatives and prints contain silver compounds from dissolution of the emulsion on print paper. These silver compounds are regulated under both RCRA and the NJDEP pre- treatment standards, and must be recycled. The EH&S has arranged for recycling of silver wastes through a local company. Please contact EH&H personnel for details and listing of your develop facility in our recycling program.

Electrical Lamps

Sodium Vapor Lamps

Sodium vapor lamps contain metallic sodium, which represents a fire and explosion hazard when exposed to either moist air or water. These lamps should not be disposed of in normal trash, and must not be broken. Please bring them to the Physical Plant, where barrel storage is located. EH&S personnel will oversee safe disposal of these lamps when sufficient quantity has been collected.

Mercury Vapor Lamps

Mercury vapor lamps contain small quantities of metallic mercury and/or mercury compounds that are considered hazardous waste under RCRA. These items must be collected for proper disposal, and should not be discarded into the normal trash. Please bring mercury vapor lamps to the ISSU Heat Plant, where a storage barrel is located. EH&S personnel will provide proper disposal through our hazardous waste vendors.

Fluorescent Lamps

Fluorescent lamps disposal is regulated under RCRA because they fail the TCLP (leachability) test for mercury. These lamps contain only small quantities of mercury, but their disposal is currently regulated because so many wind up in landfills. The EH&S will keep you informed of changes regulating how these items are to be disposed of in New Jersey. At this time, do not discard any fluorescent lamp bulbs into ordinary trash.

Recordkeeping

RCRA requires that generators keep records verifying that hazardous wastes are segregated, packaged, labeled, stored, transported, treated and disposed of in accordance with regulations established by EPA, and that the hazardous wastes are transported over the public roads in accordance with the regulations of DOT. State law may require similar recordkeeping on applicable state hazardous waste handling requirements.

According to U.S. DOT regulations, any generator who transports off-site hazardous material, including hazardous waste, is required to complete a manifest to accompany the shipment. The manifest is used to verify the contents of the hauler and to support containment and cleanup operations in the event of an accident. In addition, EPA regulations specify how the shipping manifest must be used to document the fate of hazardous wastes (40 CFR 262, Subpart B). To satisfy EPA regulations, each class of hazardous waste generator must record on a manifest for hazardous wastes:

- name of transporter
- name and address of treatment, storage or disposal facility
- EPA identification numbers
- the quantity of the specific contents of each waste container, including DOT identification
- numbers, waste classification and proper shipping name, signatures of the person(s) at generator's facility, transporter, and receiving facility's manager.

The largest class of generators must file reports on hazardous waste handling activity. The federal biennial report is a summary of generator, transporter and disposal facility activity that must be submitted to the Regional EPA Administrator. NJ Department of Environmental Protection requires that generators of hazardous wastes report on hazardous handling activities annually.

Generators are only required to keep a copy of manifest, landban certifications, and generator reports for three years.

Training Requirements and Responsibilities

There are specific training requirements for individuals who work with hazardous waste. These requirements are found in federal code, and specify minimum training levels and re-certification intervals. For this reason, the people who are designated as material handlers, laboratory supervisors, and custodial workers must be certified to work with hazardous waste. In addition,

there are training requirements under OSHA for those who work with hazardous materials, a much broader class of materials by OSHA definition. It is very important that all MSU employees who work with hazardous waste and hazardous materials receive proper training. Under OSHA, this definition will include stockroom personnel, teaching assistants, graduate assistants, faculty, and staff, custodians, shipping/receiving, grounds maintenance, essentially anyone who can be considered an employee of the State by virtue of being paid from State funds. Faculty who receive federal grant monies are already under this definition, and should be trained.

The Environmental Safety & Sustainability Office provides training which meets the OSHA Hazard Communication Standard for employees.

Responsibilities of Waste Generators

There are several responsibilities common to all hazardous chemical waste generators which must be followed. Chemical waste handling procedures, proper packaging and labelling, and proper training in chemical safety and awareness should be utilized including precautions appropriate to the hazard class of the chemicals in the waste material. These precautions include as a minimum:

a) Conduct all operations involving chemical waste in a properly functioning chemical fume hood

b) Use appropriate personal protective equipment (PPE) such as eye, face, skin and

respiratory protection whenever working with chemical waste

c) Use secondary containment to control the spread of any spill that may occurs in a

fume hood.

c) Do not mix incompatible waste streams in the same SAA or fume hood.

d) Due to the variety of hazardous chemical wastes encountered, it is extremely important for waste generators to correctly evaluate, pack, and label their hazardous chemical waste. This will help ensure the safety of all personnel who encounter hazardous chemical waste in their work.

Teaching Laboratories

Hazardous chemical waste generated in teaching laboratories should be properly packaged, labeled and stored in a proper storage area. In accordance with departmental or college policy, the materials manager, instructor, or teaching assistants should be responsible for collection and management of all wastes generated by student experiments in their laboratory. No potentially hazardous waste materials should be left in student drawers, lockers, on bench tops, or in

chemical fume hoods. The professor and teaching assistant should work closely with their material handler and the EH&S office in evaluating wastes generated in their labs. If any student preparations meet the criteria of hazardous waste, they must be prepared for disposal within an appropriate SAA. Test tubes, vials, mason jars, open containers and some plastic containers are often found in teaching labs, and are not acceptable as hazardous waste containers.

Research Laboratories

The requirements for hazardous chemical waste generation in research laboratories is essentially the same as in teaching laboratories, except that the wastes generated may need further characterization and analysis, depending on the starting materials. Material Safety Data Sheets (MSDSs) for all chemicals used in a research lab should be made available to all personnel working in that area.

Non-Laboratory University Facilities

Many kinds of chemical wastes are often generated outside of either teaching or research laboratories. Most are not regulated as hazardous wastes, but some can be dangerous, depending on their use and properties. Be aware of the contents of chemicals, pesticides, paints, cleaners, and solvents which may be used in your work area. If you have questions about these materials, refer to the Material Safety Data Sheets which should be available in your work area.

Custodial Employees

Custodial employees must be considered when disposing of non-hazardous and hazardous solid waste. These personnel must not encounter hazardous chemical waste in maintaining floors, sinks, counter or bench tops, closets, or waste recepticles. All non-hazardous chemical waste must be placed in separate disposable containers or plastic bags and clearly labelled as non-hazardous waste before discarding into a waste recepticles. Also, sharp items such as broken glassware or needles need to be placed in an appropriate "Sharps" container and labelled as such. Remember that combinations of non-hazardous waste may turn out to be DANGEROUS to your own health and safety.

Maintenance and Operations Employees

These employees frequently come into contact with potentially hazardous chemicals and hazardous waste. Examples include pesticides, cleaning agents, oil-based paints and stains, PCB oils, cylinderized gases, and shipments of incoming chemicals. Some of these generate hazardous waste after usage. If you work with any of these chemicals or mixtures and would like more detailed information concerning the risks and precautions recommended for safe handling and disposal, contact the EH&S office at X4367.

Hazard Communications

It is important that each person who uses or is exposed to chemicals in their environment understand the benefits and risks associated with exposure to these materials. The use of Material Safety Data Sheets, reference texts, safety training, work demonstrations, videos, and medical monitoring can be beneficial for individuals who are potentially exposed to chemicals and their chemical hazardous waste. The EH&S office strives to maintain a complete inventory of hazardous materials located on campus, and informational data to educate the University personnel concerning the hazardous properties.

Chemical Purchases

There are currently no limitations placed on ordering of chemicals by the various departments at MSU. This poses many problems with maintaining our SQG status, particularly regarding P-listed chemical wastes under RCRA. At present, it is a good idea to not order chemicals which may become P-listed hazardous waste without first notifying the EH&S. By evaluating all purchases for potential quantities of waste generated, the EH&S office can help MSU meet the "cradle-to-grave" responsibilities under RCRA. Appendix E contains the list of D-listed hazardous chemical wastes, and P-listed wastes can be found at 40 CFR 261.33. Please review these lists prior to each chemical purchase. IT IS VERY IMPORTANT THAT MSU MAINTAIN THE SQG STATUS FOR ITS LOCATIONS!!

Since there is no central chemical stores or specific method of effective control of chemical purchases on the MSU campus, it is the responsibility of each person who obtains any specific chemical or chemical mixture to obtain an MSDSs both for themselves and the EH&S office. MSDSs can be obtained directly from the manufacturer, and should be supplied at the same time as the original order.

Chemical Inventory Tracking System

The Chemical Inventory Tracking System is designed to help all University departments and users to track the location of chemicals on the campus. It is expected to be fully implemented in Fall of 2000, including the bar coding capability. Please contact the EH&S office at X4367 for more information on this system and its availability.

Personal Protection Equipment (PPE)

Whenever hazardous chemicals or hazardous waste are used by or handled in an area of the University, proper personal protection equipment should always be used to protect all potentially exposed personnel. This includes, but is not limited to, safety glasses, chemical gloves, face shields, aprons, lab coats designed to offer chemical splash protection, and filtering face masks. The use of personal protection equipment (PPE) is covered in Chemical Safety training offered by the EH&S office. It is advisable to cover the use of PPE prior to initiation of activities

involving any chemicals, and to repeat the training whenever a significant change in use occurs. Please consult with the EH&S office for assistance involving PPE.

Emergency and Disaster Response

The Environmental Health and Safety Office can respond to a variety of incidents which involve hazardous materials and chemical hazardous waste. It is best to be aware of the ways of reaching both Environmental Health and Safety Office personnel PRIOR TO an actual emergency. Emergency telephone and emergency paging numbers are found at each facility and in the front of this manual. Be sure you have these numbers handy in the event of a chemical spill, fire, or other emergency. In the event of a power loss on the campus, the EH&S office is located in College Hall room 206. Remember, what happens in the first five minutes of an emergency will often determine the outcome. Be prepared for safety.