MICHIGAN STATE UNIVERSITY | Environmental Health and Safety

# BIOHAZARDOUS WASTE MANAGEMENT PLAN

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Environmental Health & Safety
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# 1 PURPOSE/VERSION

This document has been prepared to provide procedural guidance to MSU biohazard waste generators and to fulfill regulatory requirements of the Michigan Medical Waste Regulatory Act (Act 368 Part 138), and the Michigan Bloodborne Infectious Diseases Standard (R325.70001 – R325.70018).

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# 2 INTRODUCTION

*Michigan State University (MSU) requires that all employees involved in the generation, handling and disposal of biohazardous waste comply with the provisions of the Biohazardous Waste Management Plan. The plan was prepared by Environmental Health & Safety (EHS) and is used in conjunction with the MSU Hazardous Waste Disposal Guide.*

The plan encompasses the general provisions for all MSU facilities (on or off-campus). However, the main document addresses the types of waste and practices used by on-campus facilities only. Specific information regarding the types of wastes generated and practices used by off-campus facilities may be found by contacting EHS at (517) 355-0153.

At MSU, the term **biohazardous waste** is used to describe different types of waste that might include infectious agents.

The following waste categories are considered biohazardous waste and are covered by the provisions of the MSU Biohazardous Waste Management Plan:

## 2.1 Medical Waste

Defined as any solid waste which is generated in the diagnosis, treatment (e.g., provision of medical services), or immunization of human beings in research and healthcare pertaining thereto, or in the production or testing of biologicals, as well as categories defined by the *Michigan Medical Waste Regulatory Act* (MMWRA).

According to the MMWRA, medical waste includes:

- Cultures and stocks of infectious agents and associated biologicals, including laboratory waste, biological production waste, discarded live and attenuated vaccines, culture dishes, and related devices.
- Liquid human and animal waste, including blood and blood products and body fluids, but not including urine or materials stained with blood or body fluids.
- Pathological waste – defined as human organs tissues, body parts other than teeth, products of conception, and fluids removed by trauma or during surgery or autopsy or other medical procedure, and not chemically – fixed (i.e., formaldehyde).
- Sharps – defined as needles, syringes, scalpels, and intravenous tubing with needles attached regardless of whether they are contaminated or not.
- Contaminated wastes from animals that have been exposed to agents infectious to humans, these being primarily research animals.

## 2.2 Regulated Waste

Defined by the Michigan Occupational Safety Health Administration (MIOSHA) Bloodborne Infectious Diseases Standard includes:

- Liquid or semi-liquid blood or potentially infectious materials.
- Contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed.
- Items that are caked with dried blood or other potentially infectious materials and can release these materials during handling.
- Contaminated sharps which include any contaminated object that can penetrate the skin.
- Pathological and microbiological wastes containing blood or other potentially infectious materials.

## 2.3 Laboratory Waste and Regulated Waste

Defined by the National Institutes of Health (NIH) Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules and Centers for Disease Control (CDC) Biosafety in Microbiological and Biomedical Laboratories publication includes:

- Contaminated waste that is potentially infectious and/or hazardous to humans, animals, or plants.

# 3 GENERAL PROGRAM MANAGEMENT

## 3.1 Areas of Responsibility

The proper segregation, treatment, and disposal of biohazardous waste can only be achieved through the cooperation of all responsible MSU personnel. This division of responsibilities includes:

### 3.1.1 EHS

The Hazardous Waste Coordinator and Biological Safety Officer or their designee will:

- Oversee the implementation of the Biohazardous Waste Management Plan.
- Develop, in coordination with administrators, additional biohazardous waste-related policies and procedures as needed to support the effective implementation of this plan and maintain compliance with regulatory requirements.
- Revise the plan each time there is a change in either of the following, within 30 days after the change occurs:
    - A person or site named in the plan.
    - The type of waste handled, or the methods of handling waste at a facility.

### 3.1.2 Supervisory Personnel

Supervisory personnel (including Department Chairs, Directors, Principal Investigators, Managers, and Supervisors) are responsible for compliance in their areas. In cooperation with EHS supervisory personnel must:

- Assure that all employees who generate, handle, treat and/or dispose of biohazardous waste receive biohazardous waste training as outlined below.
- Assure that all employees under their supervision who generate, handle treat and/or dispose of biohazardous waste follow the procedures outlined in this document.

### 3.1.3 Employees

Employees who generate, handle, treat, and/or dispose of biohazardous waste are responsible for:

- Following the procedures and practices outlined in this document.
- Participate in a biohazardous waste training session.

# 4 BIOHAZARDOUS WASTE AT MSU

## 4.1 Types of Biohazardous Waste on Campus

At MSU the following types of biohazardous waste may be generated and/or handled:

- Cultures and stocks of infectious agents and associated biologicals, including laboratory waste, biological production wastes, discarded live and attenuated vaccines, culture dishes, and related devices.
- Liquid human and animal waste, including blood and blood products and body fluids, but not including urine or materials stained with blood or body fluids.
- Pathological waste including human organs, tissues, body parts other than teeth, products of conception, and fluids removed by trauma or during surgery or autopsy or other medical procedure.
- Sharps, which means needles, syringes, scalpels, intravenous tubing with needles attached; any item that is sharp enough to penetrate the skin and is contaminated with potentially infectious material.
- Contaminated wastes from animals that have been exposed to agents infectious to humans or animals, these being primarily research animals.
- Wastes generated in recombinant or synthetic nucleic acid molecules research.
- Animal carcasses and wastes (i.e., bedding) that have been generated in infectious disease research or recombinant or synthetic nucleic acid molecules research. Refer to the MSU Hazardous Waste Disposal Guide for information regarding disposal of animal carcasses generated in other types of research.

## 4.2 Segregation, Packaging, Labeling and Collection

### 4.2.1 General Methods

- All biohazardous waste is to be packaged, contained, and located in a manner that prevents and protects the medical waste from release at the producing facility at any time before ultimate disposal.
- Primary containers (other than biohazard bags) used for medical waste collection storage and disposal are to be labeled with a biohazard symbol, or the words “Medical Waste”, or “Pathological Waste” in letters not less than one inch high. The required background color of all primary containers is red or orange fluorescent (e.g., biohazard bags).
- All waste containers that are picked up by EHS should be labeled with a MSU Materials Pick Up Tag (Waste Tag) in accordance with the MSU Hazardous Waste Disposal Guide.

## 4.2.2 Waste Type-Specific Management Methods

### *4.2.2.1 Liquid*

All **liquid** cultures and stocks of materials contaminated with an infectious agent and associated biologicals, including laboratory waste, biological production wastes, discarded live and attenuated vaccines, shall be stored in closable, puncture – resistant containers and decontaminated by autoclaving or chemically treated. After autoclaving or chemically treating liquid decontaminated waste can be disposed of in a sanitary sewer **if no other hazardous materials are present** (e.g., chemicals, heavy metals, and/or radioactive materials). For information on the special treatment of radioactive biohazardous waste, contact EHS at (517) 355-0153.

### *4.2.2.2 Solid*

All **solid** cultures and stocks of materials contaminated with an infectious agent, culture dishes and related devices other than sharps, can be stored in leak – proof, biohazard bags prior to decontamination. The use of a secondary leak – proof container or bag is advised.

- Solid biohazardous waste (excluding sharps) that has been decontaminated by autoclaving, may be disposed of in the lodal (dumpster) if they are securely packaged in leak – proof containers and the biohazard warning labels have been removed or the container is clearly labeled as decontaminated biohazardous waste.
- Decontaminated waste in biohazard bags with an “AUTOCLAVED” bag indicator must be placed inside a non-see-through (opaque) plastic bag or other secondary non – transparent container (box) prior to disposal in the lodal. It is imperative that the waste is sufficiently autoclaved (darkening of the indicator) prior to disposal. Only biohazard bags with the “AUTOCLAVED” indicator are currently approved by MSU. These bags are available at University Stores and Biochemistry Stores.

### *4.2.2.3 Blood*

All blood and blood products and body fluids **that do not contain a hazardous chemical**, shall be disposed of by one of the following methods:

- Flushing down a sanitary sewer.
- Decontaminated by autoclaving and disposed of in the landfill.

If the waste contains a hazardous chemical contact Hazardous Waste Team at EHS for instructions.

### *4.2.2.4 Human Pathological Waste*

Human pathological waste shall be cremated or buried in a cemetery. Small pieces of tissue and fluids shall be ground until rendered unrecognizable and flushed down a sanitary sewer or incinerated. For disposal of animal waste (carcasses or tissue), refer to the MSU Hazardous Waste Disposal Guide.

### *4.2.2.5 Sharps*

Sharps shall be disposed of by a certified waste hauler. Place discarded needles and syringes into an approved MSU sharps container. An approved sharps container is one that is leakproof, puncture – resistant, closable, bears the biohazard symbol and is manufactured as a sharps container. Sharps containers used on campus should also be labeled with the EHS “Sharps” label to facilitate proper

treatment and disposal of containers. Do not clip, bend break, or recap sharps. A sharps container must be permanently closed and disposed of through the EHS when:

- It is ¾ full and/or
- Within 18 months of the date that the first sharp was placed in it, whichever comes first

For pick – up request, refer to the MSU Hazardous Waste Disposal Guide.

#### *4.2.2.6 Animal Waste Contaminated*

Animal waste contaminated with organisms infectious to humans shall be collected in biohazard bags or other leak – proof containers labeled with a biohazard sticker and disposed of by incineration.

#### *4.2.2.7 Animal Waste non-infectious*

Animal carcasses generated in infectious disease research or recombinant, or synthetic nucleic acid molecule research will be stored in leak – proof containers labeled with a biohazard sticker and disposed of by incineration.

#### *4.2.2.8 Recombinant Waste*

Waste generated in recombinant or synthetic nucleic acid molecule research will be stored, treated, and disposed of in the same manner as comparable waste types (i.e., liquid, solid, sharps) generated in infectious disease research.

#### *4.2.2.9 Soil Research Waste and USDA/APHIS Permit Waste*

All soils can and do contain bacterial, viruses, protozoa and helminths with potentially toxic metabolites and therefore must be decontaminated through autoclaving prior to disposal. Follow your USDA/APHIS permit using the specific autoclave listed ensuring it has been certified and calibrated according to permit requirements. Contact the greenhouse manager for use of a steamer when large amounts of soil need to be decontaminated. The Environmental Protection Agency has a special document EPA/600/R-10/092 from October of 2010 that also requires decontamination of soil samples.

## 4.3 Use and Methods of On-Site and Off-Site Storage, Decontamination, and Incineration

### 4.3.1 Decontamination by Autoclave

Biohazardous waste, other than sharps and pathological waste, may be decontaminated on – site by autoclaving. Personnel must use an autoclave that has been tested and approved through EHS for biohazardous waste decontamination. Approved autoclaves are labeled on or near the autoclave. The label will list the operating parameters for effective waste decontamination for that specific autoclave. These parameters must be followed by all personnel using the autoclave for waste decontamination purposes.

The EHS tests all autoclaves used for waste decontamination on at least an annual basis to verify that operating parameters used for waste treatment are sufficient and effective for biohazardous waste decontamination. For more information, contact the EHS at (517) 355-0153.

### 4.3.2 On – Site Incineration

On – site incineration is conducted by EHS. For more information regarding incineration, contact EHS at (517) 355-0153.

### 4.3.3 Waste Haulers

Corporate or other legally recognized business name of solid waste haulers who transport medical waste for the producing facility:

Hospital Network Healthcare Services, LLC, 6212 American Ave., Portage, MI 49002, 269-329-3200, 877-681-1095, Fax: 269-329-8200, Email: support@hnv-hnhs.com

### 4.3.4 Sanitary Landfills, Cemeteries and Other Disposal Sites

All autoclaved and decontaminated biohazardous waste will be disposed of in a Type II Sanitary Landfill.

# 5 EXPOSURE MINIMIZATION METHODS

## 5.1 For Employees Involved in Biohazardous Waste Generation, Handling and Disposal

In accordance with MIOSHA regulations, MSU has implemented an Exposure Control Plan (ECP) for Bloodborne Pathogens. The ECP covers the areas of protocols, procedures, and training, personal protective devices and clothing, physical containment or isolation devices or systems, and prevention or control of aerosols regarding bloodborne pathogens.

MSU has developed a Biosafety Manual outlining necessary procedures and practices involving infectious agent research and recombinant or synthetic nucleic acid molecule requirements.

Other training programs to meet the needs of personnel who may not receive information on this topic through routine EHS training programs are available.

# 6 BIOHAZARDOUS WASTE TRAINING

All personnel who generate, handle, or dispose of biohazardous waste must complete training in the provisions of this plan. Online training is through EHS, links are available on the website. The training topics will include:

- Purpose and overview of the MSU Biohazardous Waste Management Plan.
- Types of biohazardous waste generated, treated, or disposed of at the work site.
- Segregation, packaging, storage, and transport of biohazardous waste that is generated, treated, or disposed of at the work site.
- Treatment and disposal methods for biohazardous waste that is generated, treated, or disposed of at the work site.

In accordance with the MMWRA, new personnel must complete biohazardous waste training before they assume duties that involve the handling of biohazardous waste.

Employees will receive updated information when a change in the Biohazardous Waste Management Plan occurs that directly affects their duties.

## 6.1 Training Records

EHS will maintain records for all on – campus personnel completing biohazardous waste training. Off – campus site coordinators will maintain training records for their facilities. These records will include:

- Employee's name
- Job classification
- Training date

All training records will be maintained for a minimum of three years.

# APPENDIX A

## MSU On – Campus Facilities

### Management

Hazardous Waste Coordinator, EHS, Brian Smith
Biological Safety Officer, EHS, Jamie Willard, PhD

### Incineration

Environmental Compliance Officer, EHS, Mary Lindsey
For information regarding on – site incineration, contact Mary Lindsey at (517) 432-5542.

### Types of biohazardous waste:

As outlined in the MSU Biohazardous Waste Management Plan

### Methods of storage, treatment, and disposal:

As outlined in the MSU Biohazardous Waste Management Plan

## MSU Off – Campus Facilities

Off – Campus site information will be available upon request.

# APPENDIX B

## Michigan Medical Waste Regulatory Act 1990

https://www.michigan.gov/egle/about/organization/materials-management/medical-waste-regulatory-program