



# MARINE BIOLOGICAL LABORATORY

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## HAZARD COMMUNICATION PLAN

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FEBRUARY 2017

APPROVAL:

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## 1 INTRODUCTION

The Marine Biological Laboratory (MBL) is committed to providing a safe work environment for staff, scientists, students and visitors in accordance with the Occupational Safety and Health Administration (OSHA) requirements in 29CFR 1910.1200 “Hazard Communication Standard” which is also referred to as the “Right to Know Law”.

### 1.1 Purpose

The purpose of the Hazard Communication Plan is to provide a written program to MBL non-laboratory personnel to understand potential hazards at their place of work. This plan complies with the requirements of the OSHA Hazard Communication Standard, local, state and federal regulations. This plan describes how to identify hazards in the workplace, through understanding of chemical labeling, Safety Data Sheets (SDS), annual safety training, handling a chemical spill and accident reporting.

All Centers and Divisions should maintain a current copy of this plan which is readily available to applicable personnel in their department.

### 1.2 Scope and Applicability

The Hazard Communication Plan applies to all individuals at MBL who have the potential of being exposed to a hazardous chemical under normal conditions of use or in a foreseeable emergency. These individuals include Plant Operations and Management (POM), custodial and housekeeping, Shipping and Receiving, Grounds and Maintenance, Human Resources, Accounting, Administrative Support, Information Technology (IT) and seasonal support staff (non-laboratory).

## 2 RESPONSIBILITIES

Responsibilities for applicable MBL personnel for safety training, supervisory oversight and adherence to MBL policies as stated in this plan are specified below.

### 2.1 Environmental, Health and Safety (EHS) Manager

- Annual review of the Hazard Communication Plan.
- Creates and revises safety policies and procedures.
- Develop and conduct safety training for all personnel.
- Monitors procurement, use, storage, and disposal of highly hazardous chemicals.
- Participates in investigations of accidents, incidents, and near misses involving hazardous chemicals.
- Provides assistance and support to laboratory personnel concerning appropriate storage, handling, and disposal of hazardous chemicals.

- Assists in cleanup and/or decontamination of hazardous spills.
- Advises, coordinates, and maintain records for hazardous waste disposal.
- Inspects safety equipment annually which includes safety showers, eyewash stations, and chemical fume hoods.

## 2.2 Department Managers

- Responsible for any personnel engaged in use of hazardous chemicals.
- Informs staff, students or those visiting their Department or Center about MBL safety policies and potential hazards in their area.
- Responsible for ensuring that policies are followed within their department.
- Ensure that their staff attends safety training.
- Enforce safe work practices and engineering controls are in place to minimize the potential exposure to hazardous chemicals.
- Ensure that equipment and PPE are available and functioning properly, and that appropriate training has been provided.
- Performs risk assessment on hazards in their area.

## 2.3 Personnel

- Review and understand the Hazard Communication Plan.
- Read and understand Safety Data Sheets (SDS) for the chemicals in their area.
- Responsible for following all safe work practices and using proper precautions required by this plan.
- Consult with supervisor or Safety Office when uncertain of risk or hazards.

# 3 CHEMICAL HAZARDS

Chemical exposures can result from inhalation, ingestion, absorption, or injection of hazardous chemicals. Below are some of the health and physical hazards of chemicals which may be present in various laboratories in MBL. It should be noted that many chemicals exhibit multiple types of health and physical hazards.

## 3.1 Health Hazards

### 3.1.1 Corrosives

Corrosives can cause severe tissue damage. A corrosive chemical is defined as a liquid with a  $\text{pH} \leq 2$  or  $>12.5$ . The major classes of corrosive chemicals include strong acids (sulfuric acid, nitric acid, hydrochloric acid, and hydrofluoric acid), strong bases (sodium hydroxide, potassium hydroxide, and ammonium hydroxide), dehydrating agents (sulfuric acid, sodium hydroxide, phosphorus pentoxide, and calcium oxide), oxidizing agents (hydrogen peroxide, chlorine, and bromine), phenol and glutaraldehyde. Personnel handling corrosive chemicals should implement the appropriate controls to minimize the likelihood of exposure to a corrosive chemical.

### 3.1.2 Irritants

Irritants are substances that cause reversible effects (swelling or inflammation) on living tissue (skin, eyes, lungs, and mucous membranes) by chemical reaction at the site of contact. Many organic and inorganic compounds that are in powder or crystalline form are irritants. While irritants are not as hazardous as corrosives, similar care should be taken to avoid their contact.

### 3.1.3 Sensitizers

A sensitizer is a substance that can cause hypersensitivity and an allergic reaction in normal tissue after repeated exposure to the substance. Allergic reactions may be immediate or delayed, occurring after several hours or even days following exposure. Examples of chemicals that may cause allergic reactions include formaldehyde, phenol derivatives, latex and isocyanates. Caution to avoid initial exposure to sensitizers should be taken, however if a chemical hypersensitivity develops contact your supervisor or the Safety Office to discuss ways to further avoid exposure.

## 3.2 Particularly Hazardous Substances

Any department that uses Particularly Hazardous Substance (PHS) should develop chemical specific standard operating procedures (SOPs) for these chemicals. These specific SOPs should include procedures for establishing a designated area, safe storage, use and handling, waste handling and disposal, and emergency procedures. Contact the Safety Office at x7424 for further information on developing a SOP.

### 3.2.1 Carcinogens

A carcinogen is a substance or a mixture of substances which is capable of causing cancer or tumor development. Carcinogens are chronically toxic substances; where their effects may only become evident after a long latency period and may cause no immediate harmful effects. There are many different types of carcinogens in terms of regulatory definitions. Select carcinogens are substances or agents that are regulated by OSHA as carcinogens; listed under the category "*known to be carcinogens*" or "*reasonably anticipated to be carcinogens*"; in the Annual Report of Carcinogens published by the National Toxicology Program (NTP) latest edition; or listed by the International Agency for Research on Cancer (IARC) Monographs as Group 1 (carcinogenic), Group 2A (probably carcinogenic) or Group 2B (possibly carcinogenic). Common examples of select carcinogens include chloroform, cobalt and nickel compounds, formaldehyde, and dichloromethane.

A subset of select carcinogens include "Regulated Carcinogens" which are chemicals regulated by OSHA under certain standards such as formaldehyde, benzene, dichloromethane, and ethylene oxide. OSHA also has "Listed

Carcinogens” that are regulated under 13 Carcinogens Standard (29 CFR 1910. 1003). These 13 carcinogens have some of the highest restrictions regarding their use, storage and disposal.

### **3.2.2 Reproductive Toxins**

Reproductive toxins are substances which affect reproductive systems (fertility, gestation, lactation, and general reproductive performance) or can cause damage to a fetus. Many reproductive toxins cause damage after repeated exposures to low levels and then their effects manifest after long latent periods. Some reproductive toxicants found in the laboratory include ethidium bromide, toluene and lead.

### **3.2.3 Highly Acutely Toxic Chemicals**

Highly acutely toxic chemicals can cause immediate harm and possible death in the event of an exposure. Median lethal dose (LD50) experiments in animal models are typically reported and used to determine if a chemical has a high degree of acute toxicity. These tests are administered orally, dermally and via inhalation. Chemicals considered highly toxic have an oral LD50 less than or equal to 50mg/kg for rats, dermal LD50 of 200 mg/kg when administered by continuous contact for 24 hours to rabbits, or median lethal concentration (LC50) of 200 ppm or 2 mg/l when administered by continuous inhalation for 1 hour to rats. Common examples include sodium cyanide, hydrofluoric acid, and carbon monoxide.

### **3.2.4 Select Agent Toxins**

Select Agent Toxins are specific toxins of biological origin which are subject to stringent regulatory requirements under 42 CFR 73. Special precautions should be taken whenever handling concentrated forms, even in small amounts. Due to the high toxicity and restricted use, MBL’s requirements are reference separately under the MBL Select Agent Toxin Policy.

## **3.3 Physical Hazards**

### **3.3.1 Flammables**

Flammable and combustible liquids can ignite readily and are regarded as fire hazards. A flammable chemical is a liquid with a flash point below 100 degrees Fahrenheit. A combustible liquid has a flash point between 100 and 200 degrees Fahrenheit. Flammable chemicals should be stored in areas with proper ventilation to avoid buildup of explosive concentrations of flammable vapors.

### **3.3.2 Pyrophorics**

Exposure of pyrophoric chemicals to air can ignite which can result in serious burns. Pyrophoric chemicals are extremely reactive toward oxygen and/or water, and must never be exposed to the atmosphere. Common examples of

pyrophoric chemicals include sodium hydride, triethylaluminium, lithium aluminium hydride and silane. Special techniques or additional engineering controls are required to handle pyrophoric chemicals.

### **3.3.3 Water Reactive Chemicals**

Water reactive chemicals are materials that can release a toxic or flammable gas when in contact with water. Some chemicals react so violently with water that even the humidity in the air can cause a reaction. Laboratory chemicals that are water reactive include lithium, trichlorosilane, and sodium hydride. Laboratory specific handling and training is required for handling of water reactive chemicals.

### **3.3.4 Potentially Explosive Chemicals**

Research laboratories in MBL do not generally handle explosive chemicals such as trinitrotoluene (TNT). However, some laboratories regularly handle and store chemicals that may become explosive upon decomposition, polymerization, oxidation or drying out. A common potentially explosive chemical is picric acid which is extremely sensitive to detonation when it becomes dry. Also very common are peroxide forming chemicals. These chemicals can form explosive crystals after being exposed to air. These chemicals must be dated when they are received and when they are opened. All potentially explosive chemicals require tracking and monitoring.

### **3.3.5 Compressed Gases**

Compressed gas cylinders present both physical and chemical hazards. Mechanical damage, excessive heat or faulty valves/regulators may result in rapid uncontrolled release of the cylinder contents. This release could result in fire, explosion, asphyxiation or frost bite. For example, frost bite can result from improper handling of liquid nitrogen which is a cryogenic liquid stored in Dewars. Precautions must be taken to prevent cryogenic material from coming into contact with the skin. Handling of compressed gas cylinders requires laboratory specific training.

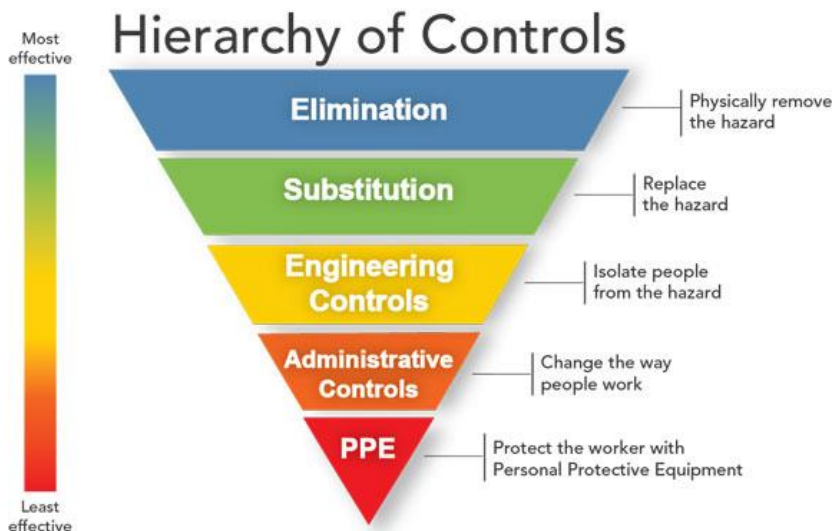
### **3.3.6 Oxidizers**

Oxidizers can initiate or promote combustion in other materials through a chemical reaction. This chemical reaction can cause a fire or explosion. Oxidizers such as nitric acid, osmium tetroxide, pure oxygen (gas or liquid), potassium permanganate, and hydrogen peroxide (concentrations  $\geq 30\%$ ) should be carefully stored and handled to avoid accidental mixing with flammables or other incompatible chemicals.

## **4 MINIMIZING CHEMICAL EXPOSURE**

Elimination, substitution, engineering controls, administrative controls, and personal protective equipment (PPE) are basic principles used to control hazards and minimize

exposure to hazardous chemicals. Before the proper controls can be selected, a hazard assessment of the process, activity, or material should be conducted.



Source: <http://www.cdc.gov/niosh/topics/hierarchy/images/hierarchycontrols.jpg>

## 4.1 Elimination and Substitution

Elimination is the most effective control as it removes the hazard completely. Most commonly this would include removing a chemical that is no longer used or eliminating a hazardous process.

Substitution is also effective at reducing the hazard, by switching the chemical or process with one that is similar. This could mean using a chemical that is less toxic or a form of the chemical that is less hazardous.

## 4.2 Engineering Controls

Engineering controls are pieces of equipment designed to reduce exposure to hazardous chemicals or other research hazards. Engineering controls include isolation, source modification and ventilation.

### 4.2.1 Isolation

For an engineering control, isolation works by inserting a barrier between a hazard and those who might be affected by that hazard. Separating personnel from a hazardous operation, process, equipment, or environment using a physical barrier (interlock system for lasers or equipment) or even distance may provide the necessary reduction of exposure.

### 4.2.2 Source Modification

Source modification involves changing a hazard source to make it less hazardous. For example, implementing systems to prepare appropriate dilutions from concentrated cleaning products.

### 4.2.3 Ventilation (Chemical Fume Hood)

The most common engineering control used in a laboratory is a chemical fume hood. As general room ventilation may not provide adequate protection against hazardous vapors, performing work in a chemical fume hood will. Fume hoods work by drawing air into the hood through the front sash and out through the top and back of hood where it is exhausted to the outside. All work with toxic or hazardous substances shall be conducted only in a properly functioning chemical fume hood.

Ventilation can also take the form of opening exterior door(s) or window(s) to provide better flow of fresh air into the specific room. In addition to increase air flow, fans can be positioned near door or window.

## 4.3 Administrative Controls

Administrative controls are changes in work procedures such as written safety guidelines, rules, supervision, schedules, signs, labels, SDSs, and training to reduce employee exposure to hazardous chemicals or procedures. At MBL, training is one of the more heavily emphasized administrative controls for all personnel.

Personnel shall follow the administrative controls listed below:

- Complete the required safety training.
- Select, use and maintain Personal Protective Equipment.
- Do not eat, drink, chew gum or apply cosmetics in laboratory or work area.
- Remove gloves and wash hands and arms with soap and water before leaving the work area or handling common items like phones, keyboards and door knobs.
- Properly manage and dispose of all hazardous chemicals and wastes.
- Keep all work areas clean and neat.
- Report any unsafe conditions to the PI/Laboratory Supervisor/Course Director or Safety Office.

## 4.4 Personal Protective Equipment

Personal Protective Equipment (PPE) shall be made available to personnel who are working with hazardous materials. PPE may include, safety glasses, laboratory coats, protective safety gloves, face shield and/or splash aprons. The purpose of the PPE is to provide a barrier between the wearer and the hazard. PPE is the least effective method of hazard control as it is highly dependent on the user to make sure it fits properly, is in good working condition, and is compatible with the hazards present.

#### **4.4.1 Body and Foot Protection**

When working with hazardous material, personnel should wear pants or appropriate clothing that covers the lower extremities to the ankles and closed-toed shoes. Protective outerwear / laboratory coats are required when working with hazardous chemicals. Depending on the type of work, additional PPE such as aprons may be necessary. These items must be removed before leaving the work area.

#### **4.4.2 Hand Protection**

Hands are the most likely parts of the body to come into contact with chemicals. Skin contact with chemicals may cause irritation, burns, or absorption of the chemical into the blood stream.

Chemical resistant gloves should be worn whenever handling hazardous chemicals or whenever there is a possibility of contact with hazardous materials. Gloves should be selected on the basis of the materials being handled, the particular hazard involved, and their suitability for the operation being conducted. Nitrile examination gloves offer better chemical protection than either latex or vinyl gloves. Departments that use chemicals are strongly encouraged to stock and use nitrile gloves. Gloves must be removed before leaving the work area.

#### **4.4.3 Eye and Face Protection**

The eye protection chosen for specific work situations depends upon the nature and extent of the hazard, the circumstances of exposure, other protective equipment used, and personal vision needs. Eye protection should be fit to an individual or adjustable to provide appropriate coverage. Personal protective eyewear includes, safety glasses, splash goggles and face shields. Safety glasses must be worn when working with hazardous chemicals. Chemical splash goggles shall be used if a splash hazard exists in any operation involving hazardous chemicals. Face shields are required for high hazard operation such as potentially explosive or chemicals with a high degree of dermal toxicity.

#### **4.4.4 Respiratory Protection**

The use of air-purifying respirators for routine work is not recommended. Exposure to potentially hazardous chemicals should be minimized through engineering controls (fume hoods) and administrative controls.

### **4.5 Laboratory Safety Equipment**

Safety equipment at MBL includes: eyewash stations, safety showers, fire extinguishers and first aid kits. All personnel should be aware of the location of the nearest safety shower and eyewash station and how to use the safety equipment. The Safety Office will inspect and test eyewash stations and safety showers annually. Plant Operations & Maintenance (POM) personnel oversee

maintenance of all fire safety equipment installed at MBL with fire extinguishers evaluate yearly by an outside vendor.

#### **4.5.1 Eyewash Stations**

Eyewash stations are available to rinse contaminants from eyes in the event of an exposure to hazardous substances or foreign particulates. An eyewash station is located inside the laboratory or in the connecting hallway which is within 10 seconds travel time from the hazard. These locations are marked with a highly visible "EYEWASH" sign. The eyewash stations provide a continuous, soft stream of tepid water simultaneously to both eyes. To activate either push handle away or pull down eyewash fixture, position eyes in full stream, and continue flushing for at least 15 minutes. Each laboratory evaluates on a regular basis that eyewash station is functioning properly and there are no obstructions for use.

#### **4.5.2 Safety Showers**

Safety showers are available to rinse contaminants from the body in the event of an exposure to hazardous substances. Safety showers also can serve to extinguish a fire on a person. Safety showers are located inside laboratories or in the connecting hallways which is within 10 seconds of travel time from the hazard. Safety showers provide at least 20 gallons of water per minute of tepid water. Upon exposure to body, remove outer clothing, activate shower by simply pulling down handle and remain under shower for recommended 15 minutes. The Safety Office performs annual inspections which includes flushing and regularly observes that stations are not obstructed.

#### **4.5.3 Fire Extinguishers**

Fire extinguishers are easily accessible in hallways and/or laboratories by all personnel at MBL. Fire extinguishers are generally mounted either near an exit or at the back of a laboratory. MBL provides areas with multi-purpose, dry chemical (ABC) and carbon dioxide (BC) extinguishers. Before considering using a fire extinguisher, pull the nearest fire alarm, call for Fire Department dialing 9-911 and MBL Security at x7911 to report a fire. Only trained employees should attempt to put out a fire (Refer to MBL Fire Plan). All extinguishers are inspected annually by POM or outside vendor. An inspection tag is attached to each extinguisher, indicating the date of the last inspection.

#### **4.5.4 First Aid Kits**

First aid kits should be accessible and their location known to all personnel. Items should be in good condition and unexpired. Supplies include bandages, burn cream, antiseptic ointment, absorbent compress, and tape. Any department which contain chemicals requiring special treatment for exposure, must have antidote within laboratory.

## 5 CHEMICAL SAFETY TRAINING

Chemical safety training will be provided for personnel prior to starting work in areas of hazardous chemicals and before new hazards are introduced.

All staff working in the proximity to a laboratory or their department works with hazardous chemicals shall be trained on the contents of the Hazard Communication Plan and any applicable SOPs that are pertinent to their specific work area. Training shall include but is not limited to:

- Contents of the Hazard Communication Plan.
- Hazards in the laboratory or department.
- Signs and symptoms associated with exposures to hazardous chemicals.
- Laboratory safety equipment, use and locations.
- How to read a Safety Data Sheet.
- Selection and use of personal protective equipment.

The Department Managers will provide the following information to personnel prior to working with any chemical or in close proximity to laboratory areas:

- The availability and location of the MBL's Hazard Communication Plan.
- Access to Safety Data Sheets (SDS) for all hazardous chemicals used in their area.
- Location and availability of any applicable SOPs for operations the employee will conduct.

### 5.1 General Chemical Safety Training

MBL's Safety Office shall provide general chemical safety training and orientation to MBL policies. This training covers general safety, safe work practices, chemical safety and emergency procedures.

The Safety Office will provide initial training to new employees either through a lecture or by online training. Similarly, the Safety Office will provide a required annual refresher training which is consistent with the information provided in the Hazard Communication Plan by lecture or online.

### 5.2 Specific Safety Training

Any staff who performs specific procedures which may cause exposure to hazardous chemicals must be trained by the Department Manager or another experienced staff member. The training should address the specific chemical hazards and emergency procedures specific to their work.

The Department Manager shall provide training related to the specific hazards and SOPs prior to commencing with applicable procedures.

### **5.3 Recordkeeping**

The Department Manager shall keep a copy of the outline of the topics covered in the specific safety training. All training records shall be kept on file and then held for at least 3 years after an employee or student leaves the MBL.

The Safety Office shall maintain records for employee general chemical safety training, employee exposure monitoring (when applicable) and compliance records.

## **6 HAZARD IDENTIFICATION**

The effective communication of hazards present in the laboratory is not only necessary for the safety of the researchers/students, but also for the safety of the support staff and emergency personnel. Therefore MBL emphasizes and encourages all staff to learn and understand the labeling of chemicals, the updated Globally Harmonized System of Classification (GHS) and information provided within a Safety Data Sheet (SDS).

### **6.1 Labeling of Chemicals**

All chemical containers must be labeled with the chemical contents and hazard associated with the chemical. All containers into which chemicals are transferred should be legibly labeled in English and must include the chemical name(s) and hazard warnings (abbreviations or chemical formulas are not allowed). Labeling of all chemical containers enables personnel and emergency responders in identifying potential hazards in an emergency situation, such as chemical spill, fire or personnel exposure.

Labels on purchased containers must not be removed or defaced (unless container has been emptied and sufficiently rinsed). Manufacturers and importers of chemicals must provide a label that includes a signal word (DANGER, WARNING), pictogram(s), hazard statement(s), and precautionary statement(s) based on the hazard classification and category of the chemical. The elements that make a label GHS compliant are described in the figure below.

### The Basic Parts of A GHS-Compliant Label

**1** → **n-Propyl Alcohol**  
 UN No. 1274  
 CAS No. 71-23-8

**2** → **DANGER**

**3** → Highly flammable liquid and vapor. Causes serious eye damage. May cause drowsiness and dizziness.

**4** → Keep away from heat/sparks/open flames/hot surfaces. No smoking. Avoid breathing fumes/mist/vapours/spray. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present. Continue rinsing.

**5** → Fill Weight: 18.65 lbs. Lot Number: B56754434  
 Gross Weight: 20 lbs. Fill Date: 6/21/2013  
 Expiration Date: 6/21/2020 See SDS for further information.  
 Acme Chemical Company • 711 Roadrunner St. • Chicago, IL 60601 USA • www.acmechem.com • 123-444-5567




**6** → 







1. **Product Identifier** - Should match the product identifier on the Safety Data Sheet.
2. **Signal Word** - Either use "Danger" (severe) or "Warning" (less severe)
3. **Hazard Statements** - A phrase assigned to a hazard class that describes the nature of the product's hazards
4. **Precautionary Statements** - Describes recommended measures to minimize or prevent adverse effects resulting from exposure.
5. **Supplier Identification** - The name, address and telephone number of the manufacturer or supplier.
6. **Pictograms** - Graphical symbols intended to convey specific hazard information visually.

Sample label courtesy of Weber Packaging Solutions • www.weberpackaging.com

## 6.2 GHS Pictograms

The Globally Harmonization System (GHS) uses standardized pictograms to convey the various health and physical hazards of chemicals. These pictograms are found on chemical labels (as shown above) and can be found on many other documents and warnings that describe chemical hazards. Please refer to the figure below with the GHS approved pictograms and their meanings.

Health Hazard	Flame	Exclamation Mark
		
Carcinogen Mutagenicity Reproductive Toxicity Respiratory Sensitizer Target Organ Toxicity Aspiration Toxicity	Flammables Pyrophorics Self-Heating Emits Flammable Gas Self-Reactives Organic Peroxides	Irritant (skin and eye) Skin Sensitizer Acute Toxicity Narcotic Effects Respiratory Tract Irritant Hazardous to Ozone Layer (Non-Mandatory)

<p style="text-align: center;"><b>Gas Cylinder</b></p>  <p style="text-align: center;">Gases Under Pressure</p>	<p style="text-align: center;"><b>Corrosion</b></p>  <p style="text-align: center;">Skin Corrosion/Burns Eye Damage Corrosive to Metals</p>	<p style="text-align: center;"><b>Exploding Bomb</b></p>  <p style="text-align: center;">Explosives Self-Reactives Organic Peroxides</p>
<p style="text-align: center;"><b>Flame Over Circle</b></p>  <p style="text-align: center;">Oxidizers</p>	<p style="text-align: center;"><b>Environment (Non-Mandatory)</b></p>  <p style="text-align: center;">Aquatic Toxicity</p>	<p style="text-align: center;"><b>Skull and Crossbones</b></p>  <p style="text-align: center;">Acute Toxicity (fatal or toxic)</p>

### 6.3 Chemical Inventory

Each laboratory or department which handles hazardous chemicals shall maintain an accurate and current chemical inventory for all chemicals stored or used in their area. The Department Manager or designee shall review and update the chemical inventory at least annually to ensure accuracy and completeness.

The Safety Office shall provide a template to each department for creating or updating their chemical inventory. Each department shall keep a copy of the chemical inventory in their area and make available to the Safety Office upon request.

### 6.4 Safety Data Sheets (SDS)

A Safety Data Sheet (SDS) is a document created by the chemical manufacturer. It summarizes safety and health information for a hazardous substance or material. Information found on an SDS includes: chemical and physical characteristics, handling procedures, storage and disposal information, and signs and symptoms of exposure.

The OSHA Hazard Communication Standard requires accessibility to up-to-date SDSs for each hazardous chemical. The Department Manager or designee is responsible for obtaining the SDSs for chemicals used and stored within their area. Departments are strongly encouraged to maintain copies of SDSs for the most hazardous chemicals. These SDSs should be maintained in a central location that is accessible to all laboratory personnel. If an SDS is not included in the shipment for the chemical, the person receiving the shipment shall contact the chemical manufacturer or vendor to request the SDS. The Safety Office will

provide assistance in obtaining a SDS for any chemical handled or stored at MBL.

Personnel at MBL can readily access SDSs online through web page link below. The Safety Office highly recommends staff to put this link on their desktop for easy access.

<https://msdsmanagement.msdsonline.com/company/AB2792A1-E462-4073-A176-A44BF345AD1E>.

Below are the different sections as required by GHS.

- Section 1 **Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- Section 2 **Hazard(s) identification** includes all hazards regarding the chemical; required label elements.
- Section 3 **Composition/information on ingredients** includes information on chemical ingredients; trade secret claims.
- Section 4 **First-aid measures** includes important symptoms/ effects, acute, delayed; required treatment.
- Section 5 **Fire-fighting measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- Section 6 **Accidental release measures** lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- Section 7 **Handling and storage** lists precautions for safe handling and storage, including incompatibilities.
- Section 8 **Exposure controls/personal protection** lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or commended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).
- Section 9 **Physical and chemical properties** lists the chemical's characteristics.
- Section 10 **Stability and reactivity** lists chemical stability and possibility of hazardous reactions.
- Section 11 **Toxicological information** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- Section 12 Ecological information.
- Section 13 Disposal considerations.
- Section 14 Transport information.
- Section 15 Regulatory information.
- Section 16 **Other information**, includes date of preparation or last revision.

## 6.5 Laboratory Safety Placards

A hazard and emergency information sign (laboratory safety placard) should be posted on the main laboratory entrance door (facing the hallway) or areas which store hazardous chemicals. The placard will alert any individual entering the room with pertinent hazards and specify required personal protective equipment to be worn in room when engaging in the handling and use of chemicals. In addition, the placard serves to notify emergency response personnel of these hazards during an emergency.

The sign identifies the chemical hazards classes using applicable pictograms which may include: Corrosive, Flammable, Compressed Gas, Carcinogen, or Biohazard. The placard will also include applicable administrative controls such as No Food or Drink and No Smoking Allowed using appropriate pictograms. In addition the responsible PI/ Laboratory Supervisor/Course Director/Manager and other designated personnel are listed with contact information in the event of an emergency (accident, chemical spill, fire, or personal injury).

## 6.6 Contractors Working at MBL

Prior to a contractor commencing work at MBL, MBL is responsible for providing contractors with the following information; a list of hazardous chemicals to which the contractor's employees may be exposed, information about the labeling system, any protective measures pertinent to area of work, location of SDS, and the provisions of MBL's safety plans.

MBL is responsible for obtaining information from contractors on all hazardous chemicals to which MBL employees may be exposed as a result of the contractor's work at the MBL premises. Contractors who bring hazardous chemicals on-site at the MBL must comply with the following requirements; provide an inventory of the hazardous chemicals with copies of SDSs to the Plant Operations & Maintenance (POM) Manager, ensure all chemical containers are properly labeled, remove all unused chemicals after the project is complete, and arrange for proper disposal of all hazardous and non-hazardous wastes by contacting the Safety Office at 508-289-7424 or [safety@mbledu](mailto:safety@mbledu).

## 7 HAZARDOUS WASTE

The Safety Office will pick up hazardous chemical waste from the laboratories and provide for disposal in accordance with local, state and federal hazardous waste regulations. The EH&S Manager will regularly monitor and arrange for pick-up for the Satellite Accumulation Areas (SAA) and disposal for the Main Accumulation Area (MAA) of hazardous waste.

## 7.1 Hazardous Waste Management

Hazardous waste chemicals regulated by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection must be collected, labeled, packaged and disposed of according to federal and state hazardous waste regulations.

Hazardous waste is any solid, liquid, sludge or containerized gas that is discarded, has served its intended use and shows any of the following characteristics:

- a. Ignitable
- b. Toxic
- c. Corrosive
- d. Reactive

The waste generator is responsible for adhering to proper waste management and disposal policies. Hazardous waste shall be collected in an appropriate container and stored in the SAA located in each laboratory, pending transfer to the MAA or pickup by a licensed third party hazardous waste contractor. Any department with hazardous material for removal should contact the Safety Office at x7424.

## 7.2 Hazardous Waste Disposal

All laboratories shall use Satellite Accumulation Areas (SAA) for disposing of hazardous waste. SAAs are located at or near the point of generation and remain under the control of the person generating the waste. For smaller laboratories at MBL, the SAAs are located in general use laboratories.

- SAAs must be posted with the sign “**Satellite Accumulation AREA**”.
- Hazardous waste in laboratory must be stored in the designated SAA.
- Containers storing hazardous waste must be in good condition to prevent leaks.
- Containers must be compatible with hazardous waste stored within them.
- Hazardous waste containers must be labeled with Hazardous Waste Labels provided by the Safety Office. The labels must include:
  - a. Words “**Hazardous Waste**” (as included on MBL labels).
  - b. Hazardous waste identified in words, such as Acetone or Toluene. Abbreviations or chemical formula are not allowed.
  - c. Associated hazard(s) checked - Ignitable, Toxic, Corrosive, Reactive.
  - d. Building, room number and name of PI/manager where waste originated.
  - e. The date when container became full.

- Except when waste is being added, containers must be closed at all times.
- Once dated, the hazardous waste container must be removed from the SAA to the MAA within three business days.
- SAAs must be inspected weekly by laboratory personnel to ensure containers are properly labeled and in good condition.

### **7.3 Expired, Obsolete or Unwanted Chemicals**

Obsolete, expired or unwanted chemicals should not be kept in the chemical stock area. They should be appropriately labeled with a hazardous waste label, dated and moved to the SAA for pick-up. For clean out of multiple chemicals, contact the Safety Office at x7424 for extra secondary containment bins and removal.

### **7.4 Broken Glass Disposal**

Glass bottles or broken glass shall be disposed in cardboard boxes marked "BROKEN GLASS ONLY". These boxes are available through the Safety Office. Broken glass shall not be disposed in regular trash bins, recycling bins or in biohazard bags.

- Glass containers for empty non-hazardous chemicals can be disposed in the broken glass boxes.
- Glass containers for empty hazardous chemicals should be labeled and placed into Satellite Accumulation Areas. Alternatively, containers can be tripled rinsed (collecting rinsed waste as hazardous waste), label defaced and then disposed in a broken glass box.
- When close to full, seal the top of the box and notify Safety Office for pick-up.

## **8 CHEMICAL SPILLS**

Chemical spills should only be cleaned up by trained, knowledgeable and experienced personnel. For chemical spills involving highly hazardous material outside of a fume hood or for a large spill of hazardous material, immediately contact Security at x7911.

### **8.1 Major Chemical Spill**

A major chemical spill includes the following situations:

- A chemical spill involves a highly hazardous (highly toxic) material outside of the fume hood.
- When a chemical spill includes an individual being exposed to a highly hazardous material.
- A large quantity of hazardous material has been spilled exceeding a 1 liter volume.

- Available Spill Kit supplies are not sufficient for cleaning up spill.

In the event of a major chemical spill, after removing contaminant from individual, immediately contact Security at x7911. For immediate medical attention call 9-911. Area should be evacuated, door closed and access to area restricted until individuals trained to handle hazard arrive.

### **8.1.1 Hazardous Chemical Spill on Individual**

If a hazardous chemical is spilled on an individual:

- Remove clothing and/or shoes in contact with clothing.
- Leave the contaminated area immediately.
- Wash off chemical in emergency shower or eyewash station for 15 minutes.
- Review SDS or applicable SOP for first aid guidance.

## **8.2 Minor Chemical Spill**

A minor chemical spill includes the following situations:

- The chemical spill has a low to moderate hazard.
- A chemical spill involves a highly hazardous material confined within the fume hood.
- Spill involves a minimum exposure to a hazardous chemical which is confined to clothing.
- Individual is aware of the chemicals hazards and trained to properly clean up the spill.
- Available Spill Kit supplies are sufficient for cleaning up spill.

### **8.2.1 Chemical Spill on Individual**

If a chemical is spilled on an individual:

- Remove clothing in contact with clothing.
- As necessary, wash off chemical in emergency shower or eyewash station.
- As necessary, seek assistance from Safety Office at x7424 or MBL Security at x7911.
- Once personal contamination has been controlled, proceed with clean-up.

### **8.2.2 Cleaning Up a Minor Chemical Spill**

All MBL laboratory areas have access to a chemical spill control kit, which contains the following items: Absorbent Pads, Broom and Dust Pan, Dust Mask, Hazardous Waste Labels, Nitrile Gloves, Plastic Bags, Safety Glasses and Safety Sorbent (2.5 lb).

Follow these procedures for a minor chemical spill using MBL's Spill Kit which are stored in a labeled 5 gallon bucket in each hallway adjacent to a laboratory:

1. Understand the chemical's hazards before proceeding with clean up. If unsure, contact Safety Office at x7424 with questions or assistance.
2. Put on appropriate Personal Protective Equipment (PPE) before attempting spill clean-up (may include gloves, safety glasses & dust mask that are provided within Spill Kit).
3. For large spills, place Safety Sorbent particulate around the spill to prevent liquid from spreading.
4. Cover spill with pads or Safety Sorbent to reduce vapors. Turn pads over to completely saturate. Replace as needed until bulk of spill is absorbed.
5. Apply Safety Sorbent directly on the spill area and agitate in a circular motion with provided hand broom.
6. Sweep up Sorbent with broom and dust pan. Repeat step #5 if necessary to thoroughly dry surface.
7. Place used pads, gloves and/or Sorbent into plastic bag, seal bag completely, apply a completed Hazardous Waste Label and place bag into the nearest Satellite Accumulation Area.
8. Notify the Safety Office by dialing x7424 or email [safety@mbi.edu](mailto:safety@mbi.edu) to report incident. Provide your name, chemical spill, specific location of spill and location of bag containing waste.

### 8.3 Mercury Spills

Mercury is a toxic metal, and must be carefully cleaned up when spilled. The mercury spill cleanup procedures are as follows:

- Notify people in the immediate area that a mercury spill has occurred and isolate the area to avoid more extensive contamination by tracking or cross-contamination.
- If the spill occurred on the floor, determine the extent of the area and mark the boundary of the spill. Do not use a vacuum for cleaning up spill.
- Use a disposable pipette to pick up mercury droplets.
- Cover small droplets in inaccessible areas with powdered sulfur or zinc.
- Place residue in a labeled container or plastic zip lock bag and contact the Safety Office for disposal at x7424.
- Thoroughly wash hands, arms and face several times after clean up.
- For a mercury spill that exceeds the quantity found in a standard mercury thermometer, contact the Safety Office for assistance.

## **9 ACCIDENTS AND MEDICAL CONSULTATION**

Accidents, incidents, injuries and medical emergencies require immediate attention. For medical emergencies call 9-911 immediately. For all other emergencies call MBL Security at x7911. As soon as possible, all incidents must be discussed with the department manager. All emergencies involving personal injury must be reported using the MBL Accident Report Form. The Accident Report Form is available through Human Resources or the Safety Office.

All personnel who have been or believe they may have been exposed to a hazardous chemical have the right to receive an employer provided medical examination. This examination is at no cost to the employee or student.

Exposure monitoring is supported by the Safety Office. The use of certain chemicals may require periodic exposure monitoring. Employees are given the right to observe the testing, sampling, monitoring, or measure of employee exposure as well as given the opportunity to review the results and discuss them with a medical professional.

### **9.1 Medical Examination**

All personnel shall be provided an opportunity to receive an appropriate medical examination performed by a licensed physician at a reasonable time and place, at no cost, and without loss of pay, under the following circumstances:

- At any time personnel believe they have been significantly exposed to hazardous materials.
- Whenever personnel develop signs or symptoms associated with a hazardous chemical to which they may have been exposed.
- If an event takes place in the work area (spill, leak, explosion or other occurrence) resulting in the likelihood of a hazardous exposure.
- Where exposure monitoring reveals an exposure level above the action level for an OSHA regulated substance.
- When medical surveillance for OSHA regulated-substances are required.
- When there are special concerns about hazardous chemicals such as reproductive toxins.

### **9.2 Information Provided to the Physician**

In the event of an individual seeking medical evaluation, MBL shall provide the following information to the physician:

- The identity of the hazardous chemical(s) to which personnel may have been exposed and a copy of the SDS for the hazardous substance.
- A description of the conditions under which the exposure occurred including quantitative exposure data, if available.
- A description of the signs and symptoms of exposure that personnel are experiencing, if any.

### 9.3 Physician's Written Opinion

In the event of a medical evaluation from a physician, MBL shall obtain a written opinion from the examining physician which shall include the following:

- The results of the medical examination and any associated tests.
- Any medical condition which may be revealed in the course of the examination which may place personnel at increased risk as a result of exposure to a hazardous chemical or use of PPE.
- A statement that the individual has been informed by the physician of the results and any medical condition that may require further examination or treatment.
- The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

### 9.4 Medical Recordkeeping

All medical examination and consultation records, including test results and physician's written opinions, shall be kept in an appropriate confidential manner by the Human Resource Department. Employee exposure records, including sampling results, SDSs or other chemical-specific information, shall be maintained in their department's files. These records shall be maintained in accordance with 29 CFR 1910.1020H "*Access to Employee Exposure and Medical Records*".