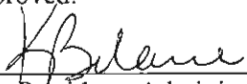
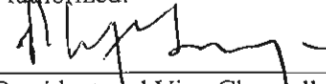
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	Submitted: Risk Management Support Group	Approved:  Vice President, Administration	Authorized:  President and Vice-Chancellor

## 1 PURPOSE

- 1.1 To provide a system for the responsible management of hazardous waste that protects individuals and the environment in all research, teaching and service facilities and activities.
- 1.2 To ensure compliance with all Federal, Provincial and Regional Government Environmental Protection Acts, Regulations and By-Laws.

**NB. The Environmental Protection Act Section 6 (1) provides that:**


**No person shall discharge into the natural environment any contaminant, and no person responsible for a source of contaminant shall permit the discharge into the natural environment of any contaminant from the source of contaminant, in any amount, concentration or level in excess of that prescribed by regulations.**

## 2 SCOPE

- 2.1 All individuals who handle hazardous materials in McMaster University owned facilities and/or host institutions.

## 3 RELATED DOCUMENTS


- 3.1 Canadian Environmental Protection Act, 1999.
  - 3.2 General Waste Management, R.R.O. 1990, Reg 347.
  - 3.3 City of Hamilton Sewer By-Law, 04-150.
  - 3.4 Air Pollution Regulation, R.R.O. 419/05.
  - 3.5 Waste Management PCB's, R.O.O. 362/ 90.
  - 3.6 Ozone Depleting Substances – Regulations 1998 (1999/01/06).
  - 3.7 Refrigerants Regulations, R.R.O. 180/07
  - 3.8 Solvents Regulations, R.R.O. 717/94.
  - 3.9 Nuclear Safety and Control Act, 1997.
  - 3.10 Transportation of Dangerous Goods Act and Regulations, 1992.
  - 3.11 Code of Practice for the Management of Biomedical Waste in Canada, Canadian Council of Environmental Ministers (CCME), 1990.
  - 3.12 Workplace Hazardous Materials Information System (WHMIS) Reg. 860 and RMM#501.
  - 3.13 Ontario Fire Code, 213/07.
  - 3.14 McMaster University Radiation Safety Program, RMM#700.
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- 3.15 McMaster University Biosafety Program, RMM#600.
- 3.16 McMaster University Asbestos Management Program, RMM#401.
- 3.17 McMaster University Lab Safety Handbook, RMM#309.
- 3.18 McMaster University Transportation of Dangerous Goods Program, RMM#505.
- 3.19 McMaster University Designated Substance Program, RMM#500.
- 3.20 McMaster University Field Trip Planning and Approval Program, RMM#801.
- 3.21 McMaster University Safety Orientation and Training and Program, RMM#300.
- 3.22 Animal Utilization Protocol of the Animal Review Ethics Board.
- 3.23 McMaster University Job Hazard Analysis Program, RMM#324.
- 3.24 McMaster University Battery Recycling and Disposal Program, RMM#506

#### 4 DEFINITIONS

- 4.1 **Hazardous Wastes-** For the purpose of this policy hazardous wastes includes but is not limited to the following substances; toxic agents, flammable material, oils and other petroleum products, corrosive substances, explosives, oxidizers and organic peroxides, compressed gases, pesticides and herbicides, pyrophoric materials, biohazardous agents, radioactive materials, contaminated soil and sharps (needles blades etc.).
- 4.2 **Supervisor** - Person who has charge of a workplace or authority over a worker.
- 4.3 **Acronyms**
  - EOHSS** - Environmental and Occupational Health Support Services.
  - PBAC**- Presidential Biosafety Advisory Committee.
  - CJHSC** - Central Joint Health and Safety Committee.
  - JHSC**- Joint Health and Safety Committee.
  - HPAC**- Health Physics Advisory Committee.
  - MSDS** –Material Safety Data Sheet.
  - HHS**-Hamilton Health Sciences
  - RMSG** – Risk Management Support Group (EOHSS, Faculty of Health Sciences Safety Office, Employee Health Services, Senior Health Physicist, Workplace Health and Benefits, Parking and Security Services and Director of Workplace Health and Benefits)
  - WHMIS** – Workplace Hazardous Materials Information System
  - FHSc** – Faculty of Health Sciences Safety Office

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## 5 RESPONSIBILITIES

### 5.1 Role of Senior Managers (Deans/ Directors / Chairs):

Senior Managers shall:

- provide the resources necessary to implement and maintain the hazardous waste management program within their area of responsibility; and
- be accountable for all extraordinary costs (e.g. costs in addition to those associated with the routine hazardous waste pickup and disposal program that includes major laboratory clean up) where necessary.

### 5.2 Role of Supervisor (Administrative and Academic):


The responsible supervisor shall:

- minimize the generation of hazardous waste by following best practices for environmental stewardship (See Procedural Guidelines Section 6);
- ensure that hazardous waste is stored safely and disposed of in the required manner (See Appendix B Hazardous Waste Disposal Procedures for Designated Waste Streams);
- provide current (less than three years old) Material Safety Data Sheets (MSDS) for all hazardous materials used in the workplace;
- ensure that all individuals supervised by them who are required to handle hazardous materials have received WHMIS Core training and have read the Lab Safety Handbook along with other health and safety training as specified by the training matrix RMM#300;
- ensure that all individuals supervised by them who handle hazardous material are trained in the safe handling, separation and disposal procedures for hazardous materials. (See Appendix B Hazardous Waste Disposal Procedures for Designated Waste Streams);
- document this training; and
- ensure that environmental health and safety issues are considered and addressed when designing field trips and when located in host institutions.

### 5.3 Role of Authorized Individuals:

Individuals authorized to use hazardous materials shall:

- follow all procedures for the safe handling, use, storage, separation and disposal of hazardous materials;
  - review the MSDS for hazardous material used in their work environment;
  - use required protective equipment and clothing when handling hazardous materials e.g. fume hoods, face shields, respirators, gloves, aprons, footwear, lab coats, etc.;
  - follow all procedures directed at minimizing the production of hazardous waste;
  - read the Lab Safety Handbook; and
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- follow McMaster University health and safety programs that are relevant to their work environment.

#### 5.4 **Role of Environmental and Occupational Health Support Services:**

The EOHSS Office shall

- manage the pickup and removal of all non radioactive hazardous wastes from various locations on campus;
- coordinate the pickup and removal of biomedical waste on campus;
- communicate with government regulators on environmental issues;
- provide direction and training as required to facilitate best practices in the handling, storage disposal and reduction of hazardous waste on campus; and
- coordinate the pickup and removal of batteries on campus.

#### 5.5 **Role of Faculty of Health Sciences Safety Office:**

The FHS Safety Office shall:

- provide direction and training as required to comply with environmental regulations and best practices in the handling, storage and disposal of chemical and biomedical waste in FHS laboratories on campus and at off campus locations;
- be consulted on the pickup and removal of biomedical waste from HHS and off campus locations in cooperation with the host institutions;
- co-ordinate the pick up and disposal of chemical waste from FHS laboratories located at HHS and off campus locations;
- coordinate the pickup and removal of batteries at MUMC.

#### 5.6 **Role of Health Physics:**


Health Physics shall:

- provide direction and training as required to comply with the Nuclear Safety and Control Act facilitate best practices in the handling, storage and disposal of radioactive materials; and
- coordinate the pickup, interim storage and disposal of radioactive materials.

#### 5.7 **Role of Risk Management Support Group:**

The Risk Management Support Group shall:

- monitor the effectiveness of the Hazardous Waste Management Program;
  - provide input based on changing legislation and/or best practices for program updates;
  - review all hazardous waste best practices and handling procedures annually for legislative compliance and safety-related processes; and
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- document this review.

**5.8 Role of PBAC – Presidential Biosafety Advisory Committee:**

The PBAC shall:

- review and approve the biomedical waste disposal procedures.

**5.9 Health Physics Advisory Committee:**

The HPAC shall:

- review and approve the radioactive waste disposal procedures outlined in all teaching, research and production initiatives involving radioactive materials.

**5.10 Joint Health and Safety Committee:**

The JHSC's shall:

- review the effectiveness of the Hazardous Waste Management Program as part of the workplace inspection process.

**5.11 Central Joint Health and Safety Committee:**

The CJHSC shall:

- review the Hazardous waste Management Program on a scheduled basis; and
- document this review.


**6 PROCEDURAL GUIDELINES**

**6.1 Hazardous Waste Minimization**

- 6.1.1 Choose non-hazardous materials where feasible (e.g. substitute spirit or digital thermometers for mercury thermometers).
- 6.1.2 Segregate hazardous from non-hazardous wastes.
- 6.1.3 Purchase hazardous materials in smaller quantities to avoid wastage.
- 6.1.4 Return unused materials to supplier (e.g. compressed gas cylinders).
- 6.1.5 Redistribute usable materials.
- 6.1.6 Reuse or re-distill materials when this can be done safely and in a cost-effective manner.

**6.2 Separation of Hazardous Waste Streams**

- 6.2.1 Separate incompatible waste streams (serious accidents have occurred because of the mixing of incompatible wastes, even in small quantities).
- 6.2.2 Be aware of hazardous waste streams currently in use at the University (See Section 8).

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### 6.3 Hazardous Waste Removal Services

- 6.3.1 Coordinated hazardous waste removal services for the various waste streams are provided by the RMSG.
- 6.3.2 Removal procedures for the various waste streams are identified in Appendix B.
- 6.3.3 The cost for removal and disposal of hazardous waste generated by major facility cleanups resulting from unusual projects, decommissioning of labs, major spills, and accidents are the responsibility of the generating department

## 7 RECORDS

- 7.1 The responsibility for maintaining records of hazardous waste shipments is assigned to the appropriate office within the RMSG i.e. Health Physics retain records of all shipments of radioactive waste material and EOHSS and FHSc Safety Office retain records of all chemical and biohazardous waste shipments.

## 8 Sample Hazardous Waste Streams:

The following are examples of incompatible waste streams that must be separated to avoid serious accidents that can result from the mixing of incompatible waste, even in small quantities. Outlined below are examples of chemicals which should not be stored together. The Lab Safety Handbook also provides a list. Always read the Material Safety Data Sheet (MSDS) of the chemical(s) you are working with to identify safe handling, storage and disposal.

### 8.1 Liquid Wastes (read MSDS for listing of incompatible materials)

- halogenated solvents (e.g. chloroform, methyl chloride etc.);
- non-halogenated solvents and oil (e.g. vacuum pump oil, varsol, turpentine, acetone ethyl alcohol, toluene etc.)
- “lean” solvents (solvents containing more than 50% water, e.g. formalin, glycol);
- aqueous wastes (water-based materials that cannot be disposed of in the sanitary sewer e.g. heavy metal wastes, dyes and stains);
- hydrochloric acid wastes;
- nitric acid wastes;
- caustic wastes (e.g. sodium hydroxide solutions);
- ammonia wastes (e.g. solutions from blue print machines);
- liquid pesticides;
- some other liquid wastes that cannot be mixed include strong oxidizing acids such as perchloric acid and chromic acid and water-reactive materials such as acetic anhydride, and cyanide solutions.



## 8.2 Special Wastes

- flammable solids (e.g. sodium dithionite, zinc dust);
- cyanides;
- water-reactive materials;
- air-reactive materials
- compressed gases;
- explosives;
- radioactive wastes.

## 8.3 Solid Wastes

- any inorganic or organic solid.

## 8.4 Biomedical and Infectious Wastes

### 8.4.1 Liquid waste


- tissue culture fluid and supernatant at Biohazard Level 2;
- liquid state blood components; and
- bodily fluids

### 8.4.2 Solid wastes

- glassware contaminated with infectious agents;
- plastic disposables in contact with infectious agents

### 8.4.3 Biological waste

- live vaccines;
  - toxins
  -
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## Appendix A

### Hazardous Waste Disposal Procedures:

#### All Campus Locations

1. Wear proper personal protective equipment when handling waste (e.g. safety goggles, lab coat, and gloves)
2. Choose the proper container for the chemical content. Do not completely fill the container, leave 20 % room. Close with a tightly fitted lid.
3. Do not mix incompatible waste chemicals (review MSDS)
4. Do not store incompatible chemicals together (e.g. oxidizers and flammables). Review MSDS for storage information.
5. Every container must be clearly labeled using the yellow McMaster University waste label. These yellow waste labels are free and available through EOHSS or Stores, ABB B 166. Fill out the label completely and place onto to the waste container.
6. Copy the item number from the chemical waste label onto the Chemical Waste Disposal Record Form (Appendix E)
7. Complete the Chemical Waste Disposal Record Form and fax to EOHSS or email to [waste@mcmaster.ca](mailto:waste@mcmaster.ca).
8. Chemical Waste Disposal Record Forms received by Friday will be scheduled for pick up the following Tuesday.


#### All Faculty of Health Sciences Locations

1. Wear proper personal protective equipment when handling waste (e.g. safety goggles, lab coat, and gloves)
2. Choose the proper container for the chemical content. Do not completely fill the container, leave 20 % room. Close with a tightly fitted lid.
3. Do not mix incompatible waste chemicals (review MSDS)
4. Do not store incompatible chemicals together (e.g. oxidizers and flammables). Review MSDS for storage information
5. Every container must be clearly labeled.
6. Complete Chemical Waste Disposal Record form to accompany waste bottles to disposal area.
7. Transport waste and inventory form using safety carriers or special cart (cart with lip around all sides) and deliver to safety technician during specified times.  
Waste is not to be left unattended, safety technician must be present.

Call the Faculty of Health Sciences Safety Office (ext. 24956) for specific day and time of disposal.

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## Appendix B

### RADIOISOTOPE DISPOSAL PROCEDURES

- Solid wastes contaminated with radioactivity - are to be segregated by researchers according to short-lived and long-lived isotopes, and placed in radioactive waste bins identified with the RWS (radiation warning symbol). An inventory of the radioactive content shall be maintained for each container.
- Radioactive sharps - are to be placed in approved sharps containers, labeled with the RWS and then placed in the long-lived waste bin.
- Aqueous wastes – high level waste is collected by Health Physics. Please mark isotope and date of last entry on container. Short-lived aqueous waste should be stored in a safe location in the lab to allow several half lives of decay to occur. Activity levels should be tracked by assaying aliquots. When activity levels have diminished below release limits assigned to each lab or research group, the waste liquid can be disposed of in the lab sink, provided that it is free of chemicals and biologically hazardous materials. A record of disposal must be kept.
- Radioactive liquid organics - should be assayed for radioactive content. These results should be provided to Health Physics to determine the best disposal methods.
- Waste liquid scintillation sample vials - should be stored closed and upright in fume hoods or fume cabinets. These will be collected for disposal by Health Physics. Do not dispose of these samples into sink drains even if they are classed as biodegradable by the manufacturer.
- Radioactive path waste - is to be packaged, labeled, and placed in the Health Physics freezer in the Central Animal Facility. Record the radioactive content on the inventory sheet attached.

Contact Health Physics concerning any other radioactive wastes.

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## Appendix C

### BIOMEDICAL/BIOHAZARDOUS WASTE DISPOSAL PROCEDURES

#### All Campus Locations

1. To set up the initial process and to arrange for initial *and* on-going supplies, contact Monica Curtis, (ext. 20335) or [mcurtis@mcmaster.ca](mailto:mcurtis@mcmaster.ca).
2. Biomedical/Biohazardous waste must be disposed into designated “yellow” bags, a biohazardous waste box (available in medium and large sizes) or appropriate sharps container.
3. All biohazardous boxes must be double lined/bagged to control leakage.
4. Leaking boxes and spills clean up is the responsibility of the individual who packaged the contents.
5. All Biohazardous boxes, containers and bags must be marked with: Generator’s Name, Building, Room Number and Date. (See Appendix F).
6. To meet environmental compliance, biohazardous waste cannot remain in your lab longer than four days. To arrange for a pickup of your Biohazardous waste, contact Materials Handling and Trucking at ext. 27721. An external provider will pick up all Biohazardous waste from Life Science Building on Mondays, Wednesdays and Fridays. [For occupants in Life Science Building (LSB), please follow the schedule and process provided in your orientation. This includes recording your waste in the log book located in LSB, Room B110].
7. All animals, such as mice, must be disposed of as per the Animal Utilization Protocol of the Animal Review Ethics Board. All insects must be euthanatized before disposal. All animals must be segregated from all other biomedical waste for disposal, bag these separately.  
Biowaste will be checked periodically by Health Physics for radioactive materials so the definition of biomedical waste must be adhered to.

*You must have approval from the Biosafety Committee for conducting any biomedical work submit the application to the Biosafety Officer – Karin Cassidy Health Sciences Centre, Room 3N1C, ext 23453 before your work begins.*

#### All Faculty of Health Sciences Locations

1. Disposal of biomedical waste will be into red bags or appropriate sharps containers. Double bagging and placing bags in a cardboard incineration box or recyclable plastic container is mandatory.
  2. Biomedical waste boxes are provided. Two red biomedical waste bags are to be placed inside the boxes before waste is generated.
-



Biomedical waste should be moved to a central waste station no more than four days after disposal.

3. The boxes must be closed and labeled according to posted directions.
4. All animals must be disposed of as per the instructions provided by the Animal Review Ethics Board.

A system for monitoring radioactivity in animals is in place under the Radiation Program protocols.

5. Individuals are responsible for cleaning up any spills/leaks from their biomedical waste containers.
-





Appendix E

## Preparing Biohazardous Waste Boxes (campus locations only)



Orientation arrows must be facing up  
Bottom flaps must be taped closed  
Boxes must be lined with two liners/bags

Observe the weights for small and/or medium. If over weight they will not be accepted.

If box is leaking or damaged it will not be accepted.



Label each box with:  
Professional Investigator or Group Name  
Building  
Room Number  
Date




Close box and tape down the centre then run two lines of tape across the width for support.

Please ensure boxes are completed in this manner or they will not be picked up.

For delivery of boxes and liners, please contact Monica Curtis at ext. 20335 or [mcurtis@mcmaster.ca](mailto:mcurtis@mcmaster.ca)

For pick up of biological waste, contact Materials Handling and Trucking at ext 27721

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## Appendix F

### Disposal of Clean Broken Glass


#### Clean broken glassware:

1. Ensure the glass is residue free by following the procedure for chemical glassware (Appendix A)
2. Glass may be packed into broken glass boxes purchased from ABB Stores located in ABB Room B166; or
3. Glass may be packed into a strong box lined with plastic bag.
4. Ensure the box is not overflowing and that pieces of glass will not protrude when the plastic liner is closed. Close the bag and box. Tape all openings with packing tape to ensure glass will not fall out of box.
5. Box may be placed in the dumpster located at the rear of most buildings (off the loading dock)

For: Radioactive Broken Glassware, call Health Physics 24226 or  
Biological call Biosafety office 23453

Broken glass containing residue but not enough of a substance either solid or liquid where it will come off or flow out/off of the broken glass:

1. Pack broken glassware in box lined with a plastic bag.
  2. Close bag and tape box with packing tape.
  3. Label for chemical waste filling in the appropriate paperwork and label for the box.
-

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## Appendix G

### Disposal of Empty Chemical Bottles (campus locations only)

1. If the content is **Water Soluble:**
  - Collect the initial concentrated rinse and discard the chemical via the Hazardous Chemical Waste Stream
  - Rinse the empty bottle with water
  - Ensure the bottle is dry and deface/remove the label
  - Place the bottle in the hallway for custodial pick up (campus only-FHSc take to waste closet)
2. If the content is **Toxic:**
  - Collect the initial concentrated rinse and discard the chemical via the Hazardous Chemical Waste Stream
  - Remove the lid and place bottle in fume hood until all liquid has evaporated
  - Ensure the bottle is dry and deface/remove the label
  - Place the bottle in the hallway for custodial pick up (campus only-FHSc take to waste closet)
3. If the content is a **Solvent:**
  - Remove the lid and place the bottle in fume hood until all the liquid has evaporated
  - Ensure the bottle is dry and deface/remove the label
  - Place the bottle in the hallway for custodial pick up (campus only-FHSc take to waste closet)

**All bottles left for pick up must have lid removed.**

**Do not place any empty chemical bottles in the recycling**

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