Biological Waste Management
Document No. BIO-006-03

1. INTENT

This Standard Operating Procedure (SOP) applies to all faculty, staff and students at Wilfrid Laurier University handling or storing infectious materials in laboratories. The SOP was developed by Safety, Health, Environment & Risk Management (SHERM) to ensure that work with biohazardous materials is conducted in a safe manner reflecting best practices and adhering to the Canadian Biosafety Standard and Canadian Biosafety Handbook published by the Public Health Agency of Canada. The information in this document serves as an extension to the information in the Biosafety Manual published by SHERM. Any questions regarding this SOP can be directed towards the Biosafety Officer.

2. DEFINITIONS

Biological Waste

Biological waste is defined as any amount of the following:

- Human blood and body fluids, including plasma, serum, other blood products, emulsified human tissue, spinal fluids, pleural and peritoneal fluids.
- Cultures and stock of microbiological agents (RG2 and RG1 cultures).
- Items contaminated with infectious agents, such as: disposable culture dishes, devices used to transfer, inoculate and mix cultures, (i.e. pipettes), and disposable bench top covers.
- Animal carcasses.
- Animal blood and materials contaminated with blood from animals are considered biological waste, and although not biohazardous in nature, are to be handled and disposed of in the same manner as biohazardous waste.
- Sharps contaminated with biological agents.

Infectious Material

An isolate of a pathogen, toxin or any biological material that is capable of causing an infectious disease.

Pathological Waste

As defined in Ontario Regulation 347, pathological waste means any of the following alone, a mixture of, or derived from;
(a) any part of the human body, including tissues and bodily fluids, but excluding fluids, extracted teeth, hair, nail clippings and the like, that are not infectious,

(b) any part of the carcass of an animal infected with a communicable disease or suspected by a licensed veterinary practitioner to be infected with a communicable disease,
(c) non-anatomical waste infected with communicable disease.

3. ROLES AND RESPONSIBILITIES

Supervisors/Principal Investigators

Supervisors and Principal Investigators (PIs) are responsible for ensuring that:

- Full compliance with the SOP exists at all times
- All individuals working in laboratories have been given adequate supervision and instruction on the hazards associated with working with biological agents
- Everyone working in the lab under the authority of the PI follows the procedures outlined within this SOP

Staff/Students Working In Labs

Staff and students working in labs are responsible for ensuring that they:

- Are familiar with the hazards and this SOP as it relates to working with biohazardous agents
- Promptly report any known accidents or unsafe conditions to their supervisor

4. GENERAL GUIDELINES

Containment Level 1 (CL1) Labs:
Biological waste at Laurier is autoclaved when possible in the onsite autoclaves. Material to be autoclaved is transported in autoclavable, leakproof containers that have been surface decontaminated to the autoclave room. Materials should be autoclaved in a timely fashion after waste generation. Until the waste can be autoclaved, it must be adequately contained in a manner that will cause no contamination with the surroundings.

Containment Level 2 (CL2) Labs:
Biological waste at Laurier is autoclaved when possible in the onsite autoclaves. Material to be autoclaved or transported outside of the containment zone is to be transported in **closed, labelled, and leakproof containers that have been surface decontaminated** to the autoclave room. Materials should be autoclaved in a timely fashion after waste generation. Until the waste can be autoclaved, it must be adequately contained in a closed, labelled, and leakproof container that will cause no contamination with the surroundings.

Waste that cannot be autoclaved, and waste that must be incinerated is disposed through an outside biological waste management company contracted by the university.

5. PROCEDURES

5.1 Packaging and Treatment

- Waste from Containment Level 1 labs must be packed into leakproof containers that have been surface decontaminated on the outside for travel outside of the containment zone to the autoclave room for treatment.
- Waste from Containment Level 2 labs must be packed into **closed, labelled, and leakproof** containers that have been surface decontaminated before leaving the containment zone.
- Containers for biohazardous waste that is to be disposed of offsite through the biological waste management company are provided by the university and can be obtained through the Biosafety Officer.

5.1.1 Liquid Waste

Waste from Containment Level 1 labs:

- Collect liquid waste in an autoclavable, leakproof container that has been surface decontaminated.

Waste from Containment Level 2 labs:

- Collect liquid waste in a closed, labelled, leakproof container that has been surface decontaminated.
- Autoclave liquid waste (both CL1 and CL2) according to the conditions specified in the Autoclave SOP.
- If it is not possible to autoclave the liquid, disinfect by adding 5% bleach in a 1:10 v/v solution bleach to liquid waste for a contact time of 30 minutes and then dispose of to the sewer if it contains no hazardous chemicals and Biological Oxygen Demand (BOD) is less than 300 mg/L and Cl is less than 1500 ppm.
- If the liquid contains hazardous chemicals, then dispose of as a hazardous chemical through the hazardous waste facility after disinfection.
    - If the BOD is greater than 300 mg/L or Cl is greater than 1500 ppm, dispose of as aqueous waste through the hazardous waste facility after disinfection.

5.1.2 Solid Waste (i.e. gloves, paper towels, non-sharp items)

Waste from Containment Level 1 labs:

- Collect solid waste in a plastic bag labelled biohazard. The bag should be placed in a autoclavable bin that is surface decontaminated.

Waste from Containment Level 2 labs:

- Collect solid waste in a plastic bag labelled biohazard. Place the bag in a closed, labelled, leakproof container that has been surface decontaminated before removing it from the containment zone.
- The container used to hold the plastic bag should not have surfaces that are easily contaminated and if the container has a lid; it should be opened via a foot pedal.
- Autoclave the waste (both CL1 and CL2) according to the conditions specified in the Autoclave SOP managed by the Research Instrumentation Technician.

5.1.3 Contaminated Sharps Waste

- Needles must not be bent, sheared, broken, recapped, or otherwise manipulated by hand prior to disposal.
- A puncture resistant, leakproof, closable sharps container must be used to hold the sharps.
- Containers for sharps waste are available from the Biosafety Officer or from the Manager, Animal Care Facilities.
- The container is then autoclaved according to conditions specified in the Autoclave SOP, or can be disposed of through the Biosafety Officer and sent to a waste management company.
- Refer to the SOP titled "Sharps Waste Management" for further details on sharps disposal.

5.1.4 Anatomical Waste

- Carcasses are to be collected in and stored in a freezer until waste pickup. The waste will be transferred into designated containers and sent to a waste management company for incineration.

5.1.5 Radioactive Biological Waste

- For liquid waste, first disinfect with a 1% sodium hypochlorite solution for 15 min, then package and label as a radioactive waste. Call the Radiation Safety Officer for further instruction.
- For solid waste, clearly label the contents of the package and contact the Radiation Safety Officer. The package will be sent to a radioactive waste management company for disposal.

5.2 Labelling

- Labels displaying the biohazard symbol must be attached to all containers holding biohazardous waste.
- The waste must have a clear label outlining the contents of the container if it is being transported offsite for disposal.
- After waste has been autoclaved and is no longer biohazardous, any biohazard symbols must be removed or defaced.
- Bags with the biohazard symbol can be transferred into regular opaque garbage bags after autoclaving, for disposal into the municipal waste stream.

5.3 Transport

- Waste coming from Containment Level 2 labs should always use a closable leakproof container or tray to transport waste from the laboratory to the autoclave room.
- The outside of the container must be kept clean such that carrying the container does not result in contamination to hands.
- It is recommended to use a cart to transport containers between rooms, with a spill kit located on the cart.

6. APPENDICES

Appendix A: Biological Waste Disposal Table

Type of Waste		Container for Disposal or Treatment	In-house Treatment	Waste Pick-up Location
Pathological Waste	Animal bedding from infected animals	Autoclave bag	Autoclave	After treatment in autoclave, place in garbage container in autoclave room
	Animal carcasses and tissue	Store in freezer until pickup day	None	Packed into containers provided by SHERM and picked up by biological waste management company
	Body fluids	Leak-proof, autoclavable container with a biohazard symbol	Autoclave	Packed into containers provided by SHERM and picked up by biological waste management company
Infectious Waste	Liquid infectious waste	Leak-proof, autoclavable container with a biohazard symbol	Autoclave or disinfect with 1% sodium hypochlorite solution for 15 minutes.	If BOD is less than 300mg/L, and Cl is less than 1500ppm (i.e. 1500mg/L) pour down drain after in-house treatment - otherwise, dispose of through chemical waste pickups
	Contaminated solid materials (non-sharps)	Autoclave bag	Autoclave	After treatment in autoclave, place in garbage container in autoclave room
Sharps Waste	Non-contaminated sharps	Puncture proof container	None	Custodial services will pick up from laboratory when packaged and sealed in a puncture proof container and labelled as "Clean broken glass for disposal"
	Sharps contaminated with biohazardous material	Puncture proof, leak proof container with a biohazard label affixed	None	Contact Biosafety Officer for pickup and disposal by biological waste management company
Mixed Waste	Liquid biological, radioactive waste	Liquid container with a radioactive label affixed	Disinfect with 1% sodium hypochlorite solution for 15 minutes. (Note: Do not use bleach with radioactive iodine, as radioactive gaseous iodine will be released.)	Lab specific situation - call the Radiation Safety Officer for further instruction
	Solid biological, radioactive waste	Plastic bag with biohazard and radioactive symbol affixed	None	Lab specific situation - call the Radiation Safety Officer for further instruction
	Solid Biological radioactive waste	Plastic leak-proof container with radioactive and biohazard labels affixed	None	Lab specific situation - call the Radiation Safety Officer for further instruction

Appendix B: Relevant Standards/Legislation/Policies

Biosafety Manual, Safety, Health, Environment & Risk Management, Wilfrid Laurier University, July 2012.

Canadian Biosafety Handbook, Public Health Agency of Canada.

Canadian Biosafety Standards, Public Health Agency of Canada.
Laboratory Health and Safety Manual, Safety, Health, Environment & Risk Management, Wilfrid Laurier University, July 2012.

7. REVISION HISTORY

Revision	*Date*	*Comments*	*Initials*
00	July 14, 2008	SOP comes into effect	SJL
01	December 2013	SOP updated to incl. CBSG	SJL
02	May 2017	SOP updated	SJL
03	March 2019	SOP updated	VB
04	MAY 2021	SOP UPDATED	RS