



Queen's University Environmental Health & Safety

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Revision: 4	Subject: Hazardous Waste Disposal Procedures	

Introduction

The Queen's policy statement on Environmental Management outlines the University's commitment to the protection of the environment through the implementation of an effective Environmental Management Program. An important aspect of this program is the proper handling, storage, and disposal of all hazardous waste generated on campus. As a result the Hazardous Waste Disposal procedures have been amended to make the disposal of waste easier, more efficient and to achieve a higher capture rate.

1.0 Process

University staff will no longer be responsible for segregating and packaging hazardous waste for disposal. All hazardous waste including **chemical, biological and radioactive** waste, will be picked up by an outside contractor directly from laboratories and shops at the request of Queen's employees. Waste needs to simply be labelled, tagged and the appropriate forms must be filled out on the Department of Environmental Health and Safety website to request a pickup.

In summary

1. Clearly label waste container/bag for disposal, identifying all constituents and pH if applicable
2. Place identifying tape around waste stating
 - a. Container/bag # (simply assign a number starting with 1, then 2 etc)
 - b. Building
 - c. Room number where waste is present
3. Place waste in a safe, obvious pickup location within the laboratory, segregate incompatibles
4. Fill out the appropriate waste disposal form on the Health and Safety website
<http://www.safety.queensu.ca/hazwaste/>
5. Waste will be picked up directly from the laboratory

Note

- a. Scheduling dates have changed; refer to pickup calendar at
<http://www.safety.queensu.ca/hazwaste/schedule.pdf>
- b. Solvent containers will be returned to the laboratory the following week

2.0 Chemical Waste Preparation

The following procedures outline the detailed requirements and steps in preparing and requesting hazardous waste for disposal.

- Do not mix incompatible wastes together



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- Determine if another person or department could use any chemicals deemed as waste.
- NO HAZARDOUS CHEMICAL is to be flushed down the drain. (As per the City of Kingston Sewer Use Bylaw) Reference your MSDS, or contact The Department of Environmental Health and Safety (EH&S) if unsure of the chemical's properties.
- Some chemicals classified as EXPLOSIVES cannot be transported by regular means. If you come across any of these please call EH&S. Shock-sensitive compounds that are suspected to contain unstable PEROXIDES should be considered extremely dangerous and must be handled very carefully. To avoid the chance of an explosion, DO NOT attempt to open such bottles (i.e. dry ethers, dry picric acid, etc.) and call EH&S. Use caution when handling chemicals that can react dangerously with air, water, or other substances.
- Special arrangements must be made with EH&S for disposal of large amounts of chemicals constituting a laboratory cleanout (more than 20 bottles larger than 100 ml)

2.1 Laboratory Chemicals

Original containers of chemicals are preferable, if using other containers ensure they are chemically compatible with the type of chemical you are disposing. Ensure containers are well sealed and the outside of the container is not contaminated. List all hazardous ingredients on container WHMIS label. Include pH for acids and basis.

2.2 Empty Chemical Containers

EMPTY CONTAINERS that contained hazardous materials, or contain minor residue must be disposed of as hazardous waste. No bottles or containers are to be thrown out in the regular garbage. Do not clean out bottles and flush the residue down the drain. Ensure bottles are well sealed and labelled with the original contents as well as the words "Empty"

2.3 Large Quantities of Waste

Specialized 5L non-breakable containers can be purchased for non-corrosive, non-flammable waste from the Department of Environmental Health and Safety. See Section 9.0 for ordering information. These are only recommended for small quantities of waste (less than 5 L/week). If you are producing larger amounts, you should purchase a round 20L plastic UN approved pail (Contact EH&S). If the container is to be returned and reused, it must be clean and clearly labelled with the building and room number so a return location can be determined. Hold containers for disposal until they are 90% full, unless you produce very small quantities of waste (i.e. less than one full container per month). This is to avoid weekly disposal of partially filled containers.

For very large amounts a 200 L drum may be appropriate, contact EH&S to make arrangements.



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2.4 Flammable Solvent Waste

Flammable solvent waste should be placed in Safety Disposal cans. These are the red or white, 10 or 20 litre, wide mouth containers. Cans must be clean (remove sludge and dispose as solid chemical waste), with a functioning and intact flame arrestor, and clearly labelled with the building and room number so a return location can be determined. Halogenated and non-halogenated solvents can be mixed in the same containers. Identify at least two chemical constituents of the highest concentration in the safety can (excluding water) and any highly toxic or reactive chemicals.

If you generate smaller amounts of solvent use the appropriate container and dispose of the waste as chemical not solvent waste.

Laboratory safety cans will be returned a week after the pickup, not the same day. Please dispose of solvents frequently to account for the longer return time, alternatively contact EH&S at 32999 if you require extra containers for your lab. EH&S has a limited number of containers available for free as part of the new system.

Fill to 90% capacity (maximum to bottom of flame arrestor) to provide sufficient headspace for changes in ambient temperatures. Hold containers for disposal until they are 90% full, unless you produce very small quantities of waste (i.e. less than one full can per month). This is to avoid weekly disposal of partially filled containers.

For proper handling and storage of solvent waste refer to the Queen's University Laboratory Flammable & Combustible Liquids Handling Procedures SOP-CHEM-07

2.5 Oil

Oil waste will be picked up in an appropriate container that is clean and properly sealed. Containers should not be larger than 20 L, unless special arrangements have been made with EH&S. Leaking containers will not be picked up.

2.6 Photographic Developer and Fixer

Photographic waste is picked up in 20 L UN approved plastic pails with a wide mouth. These can be purchased from EH&S. The containers must be clean and clearly labelled with the building and room number so a return location can be determined. Hold containers for disposal until they are 90% full, unless you produce very small quantities of waste (i.e. less than one full container per month). This is to avoid weekly disposal of partially filled containers.

Waste containers will be returned a week after the pickup, not the same day. Please dispose of liquid waste frequently to account for the longer return time, alternatively contact EH&S if you require extra containers for your lab.



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2.7 Batteries

All waste batteries must be placed in a container such as a box or bag. Seal any leaking batteries in plastic bags ensuring there are no leaks. Leaking batteries/bags will not be picked up. Accumulate a small box (1'x1') prior to disposal if possible. Request a pickup using the Chemical Waste Disposal form.

2.8 Paint

Latex paint can be disposed in the regular garbage, provided the cans have been allowed to dry and no liquid paint residue is present. All other paints will be picked up as chemical waste. Ensure cans are sealed and not leaking. For easier handling, place cans in a cardboard box.

2.9 Aerosol Cans/Compressed Gas Cylinders

Do not throw aerosol cans & cylinders out with regular garbage. Place all cans in a box and dispose as Chemical waste.

2.10 Silica Gel

Waste silica will be picked up in plastic jugs, glass bottles and/or 20 L pails. Dispose as chemical waste.

2.11 Asbestos

Research departments can request pickup of materials containing asbestos (burner plates, gloves, clamps etc) by filling out the chemical request form. Ensure material is well sealed in a bag and labeled "Asbestos". Equipment, such as ovens, containing asbestos should be handled through the University's Equipment Decommissioning system at <http://www.safety.queensu.ca/decom/decomrequest.htm>.

2.12 Polychlorinated Bi-Phenyls (PCBs)

DO NOT bulk any liquid potentially contaminated with PCBs. If PCBs are suspected, contact EH&S to make special arrangements for testing and transportation. Please call EH&S for the disposal of transformers, old capacitors, ballasts and other parts that could potentially contain PCBs.

2.13 X-Ray Film

Do not throw x-ray film in regular garbage. Place all film in a box clearly labelled WASTE X-RAY FILM and dispose as chemical waste.



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2.14 Sharps

Sharps containers must be segregated into chemical or biological sharps. Refer to SOP-SAFETY-12 Sharps Disposal. Use only approved sealable sharps containers. For Chemical sharps deface all biohazard symbols and identify at least two chemical constituents of the highest concentration in the sharps container and any highly toxic or reactive chemicals. Write these on the sharps container and the request form, along with the words "Chemically contaminated sharps". Dispose as chemical waste.

2.15 Pasteur Pipets

Pasteur pipets must be treated as chemical sharps. Place pipets in a box lined with 6 ml plastic or other suitable hard non leaking container, seal when full and dispose as chemical waste. Label clearly as "Chemically contaminated Pasteur pipets" and include at least two chemical constituents of the highest concentration and any highly toxic or reactive chemicals.

3.0 Biohazard Waste Preparation

Most material can simply be decontaminated or disinfected and subsequently handled as normal waste. Some material must be sent for incineration.

All biohazard material from laboratories:

Level 1 must be disinfected prior to disposal

Level 2 must be disinfected before removal from lab or double bagged for autoclaving or sent for incineration

- Disinfected material that is no longer biohazardous must be placed in a regular garbage bag after ensuring that all biohazard warning labels are defaced.
- Most liquids generated from research activities (after disinfection) are suitable for sewer disposal. All wastes to be disposed of by sewer must be registered and approved by E.H.&S. to ensure compliance with the City of Kingston sewer-use bylaw.
- All sharps must be placed in an approved sharps (hard shell) container (available from Department of Environmental Health and Safety). The surface of the container should be decontaminated using a method appropriate for the biohazards in use in the laboratory, prior to it being sent for incineration, as per SOP-SAFETY-12 Sharps Disposal.
- All animal carcasses must be placed in 6 mil dark plastic bags (body bags) (available from the Department of Environmental Health & Safety) and frozen prior to being sent for incineration.



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4.0 Radiation Waste Preparation

- DEFACE all radioactive warning labels (don't use radioactive warning tape to seal bag)
- SEGREGATE all solid isotope waste and pack them in separate bags
- SEPARATE liquid-filled scintillation vials from all other material and lead pigs from any other wastes - wipe test pigs (keep record) and make arrangements through EH&S.

5.0 Identification

Complete and accurate identification of all chemical waste is the most important factor in providing safe and environmentally sound hazardous waste management. Furthermore, it is **illegal to transport unknown materials** under the TDG Regulation. It is therefore essential that the chemical name, contaminants and concentrations be identified.

NOTE: For mixed solvent waste, chemically contaminated sharps and pasteur pipets waste, identify at least two chemical constituents of the highest concentrations (excluding water) and any other highly toxic or reactive chemical.

NOTE: INDIVIDUAL DEPARTMENTS MUST COVER ALL COSTS OF ANALYSIS/IDENTIFICATION WHEN THE IDENTITY OF A MATERIAL CANNOT BE DETERMINED WITH CERTAINTY.

- Label all containers (bottles, bags, jugs, pails etc) containing chemical, biohazard or radiation waste as per WHMIS requirements clearly identifying all hazardous components and concentrations.

5.1 Chemical and Solvent Waste

Includes: laboratory chemicals, cleaning products, ethidium bromide gels, ethidium bromide contaminated waste (gloves, paper towels etc), phenol/chloroform contaminated waste, chemically contaminated sharps, mercury, mercury containing bulbs and thermometers, x-ray film, oil, paint cans, aerosols, batteries, silica gel, pesticides and herbicides, flammable and combustible liquids, 10 or 20 L solvent cans, lead, asbestos, etc. **but does not include** explosives, see section 2.0, or materials containing or contaminated with polychlorinated bi-phenyls (PCB's). See section 2.12.

Label

In addition to a WHMIS label that must include the chemical constituents, place a colored tape (any tape you can write on will be sufficient) around the neck of the containers to be disposed of indicating the following:



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1. Container # (assign a number starting with 1, then 2 etc. Do not duplicate numbers for waste, whether biological, radioactive or chemical.)
2. Building
3. Room number where chemical is located

5.1.1 Flammable Solvent Waste

Identify at least two chemical constituents of the highest concentration in the safety can (excluding water) and any highly toxic or reactive chemicals.

5.1.2 Empty Chemical Containers

Ensure empty chemical bottles are labeled with the original WHMIS label describing the previous chemical constituents. Also mark "Empty" on the container. Container numbers and contents descriptions do not need to be assigned to empty bottles, simply enter the total number of empty containers on the "Empty Containers" pickup request form.

5.1.3 Small Containers

Small chemically compatible bottles of chemicals such as enzymes, indicators, proteins, and other organics of 50 ml/g or less may be packaged together in a box or bag and then labeled together as per section 5.1.

5.1.4 Sharps

Sharps containers must be segregated into chemical and biological sharps. For chemical sharps deface all biological markings and label container with "Chemically contaminated Sharps" dispose as chemical waste. Refer to SOP-SAFETY-12 Sharps Disposal.

5.2 Biohazard waste

Includes: Biohazardous waste that must be disposed of by incineration, human or animal anatomical waste, noticeable quantities of blood, biohazard sharps containers, some biological toxins (e.g. lipopolysaccharide (LPS)), and biohazardous waste that is contaminated with chemicals that would not be compatible with autoclave decontamination.

Note: that incineration is sometimes the recommended strategy for blood and anatomical waste because of aesthetics and sensitivities associated with the waste, not because they necessarily pose any significant risk to human health, although in the case of fresh human blood and tissue that would be a concern.



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Biohazard waste that can be safely and effectively decontaminated by autoclaving should continue to be treated in that way prior to disposal in the regular waste stream (labeled as “**decontaminated**”).

Label

In addition to a WHMIS label, place a colored tape (any tape you can write on will be sufficient) around the neck of the containers to be disposed of indicating the following:

1. Container # (assign a number starting with 1, then 2 etc. Do not duplicate numbers for waste whether biological, radioactive or chemical.)
2. Building
3. Room number where chemical is located

5.3 Radiation Waste

Includes: Scintillation vials, radioactive solid and aqueous waste, vials, **but does not include** sealed sources. For disposal of sealed sources contact the university Radiation Safety officer.

Label

1. Fill out a yellow radiation tag and
2. Write a **container #** on the tag. (Assign a number starting with 1, then 2 etc. Do not duplicate numbers for waste whether biological, radioactive or chemical.)
3. Place the tag around the neck of the waste container to be disposed.

Tags can be obtained from the Department of Environmental Health & Safety
<http://www.safety.queensu.ca/supplies.pdf>

6.0 Waste Pickup Location

A chemical technician will come directly into the lab/shop to pick up your hazardous waste. It is therefore important that you clearly indicate on the request form the location in the lab where the tagged waste is located. Please use the following guidelines for the safe storage and segregation of your waste.

6.1 Chemical Waste

Consolidate all chemicals for disposal in one safe location, such as a fumehood, based on chemical compatibility. Place chemicals of different chemical properties into secondary containers such as a tray to provide physical segregation and avoid reaction should a chemical spill or leak. Alternatively use a safe distance to segregate incompatible chemicals. The original storage location(s) can be used, please



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gather any chemicals from the same group together for ease of pickup and clearly indicate location on the request form.

6.2 Solvents

A maximum of 50 L of Flammable liquids is allowed in the open laboratory. Any amount beyond this must be in a flammable storage cabinet. Waste Solvent cans are classified as flammable waste, therefore, ensure this amount is not exceeded. Refer to Laboratory Flammable & Combustible Liquid Handling Procedures SOP-CHEM-07 or General Flammable & Combustible Handling Procedures EHS SOP-CHEM-08 for non-laboratory areas. Store any solvent waste for pickup in accordance with these procedures and clearly indicate location on request form. Gather cans or bottles in one location if possible for ease of pickup.

Note: The online **solvent request form** should only be used for 10 or 20 L safety containers (Solvent cans). Bottles (4L or less) of solvent should be requested using the **chemical request form**.

6.3 Biohazard waste

Keep waste in your normal storage location within the laboratory and indicate location on form. Leave tagged bags or jugs clearly visible.

6.4 Radioactive waste

Keep waste in your normal storage location within the laboratory and indicate location on form. Leave tagged bags or jugs clearly visible.

7.0 Pickup Request

Only online electronic requests will be accepted. If you do not have access to a computer please speak with your supervisor. Pickups will take place on alternating Wednesdays:

- Week 1: Solvent waste (10 or 20L solvent cans only), biological, radioactive, empty containers
- Week 2: All solvent(10 or 20L solvent cans +bottles), chemical, empty bottles.

Refer to online **Waste Pickup Schedule** at <http://www.safety.queensu.ca/hazwaste/schedule.pdf> to determine what type of waste is being picked up that week.

Pickup requests must be received no later than 9:00 am on Tuesday to ensure your waste is picked up that week.

Note: If a pickup is missed, waste will be picked up on the next scheduled date.



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7.1 Requesting a pickup online:

1. Go to <http://www.safety.queensu.ca/hazwaste/>
2. Click on the appropriate category of waste (Chemical, Solvent, Empty Containers, Biological or Radioactive). This page can also be accessed from the main safety webpage by selecting **Waste Disposal** under the Chemical, Biosafety, Radiation tabs.
3. Fill out all fields on the form, call EH&S at 32999 if you encounter difficulties.
4. Click Submit to complete your request

Note:

- Fill out the complete waste description including all contaminants and corresponding concentrations. Include pH for acids and bases. Do not use trade names or formulas unless necessary.
- For empty bottles that used to contain chemicals, use the Empty Containers form.
- Clearly indicate the location of the chemical in the lab
- An **account code** is required for cost recoverable and independent departments only (PPS, Printing, AMS clubs and organizations, etc.) NOT Queen's research and administration departments.

Important: In the event that no one is in the laboratory at the time of the pickup, the contractor will have full access to pickup your tagged waste. They will be accompanied by staff from Environmental Health & Safety Staff for a number of weeks. Please contact Environmental Health & Safety if there are any access issues.

8.0 Waste Rejection Criteria

EH&S reserves the right to reject any waste that does not meet the specified criteria for proper disposal. The researcher will be contacted by EH&S and asked to correct the problem.

9.0 Supplies Ordering Information

Several waste disposal supplies can be obtained from Environmental Health & Safety by filling out a form on the <http://www.safety.queensu.ca/supplies.pdf>. Include an account code, room number, department and building information with your order. Items available include waste disposal bags, sharps containers, 5L waste containers, radioisotope tags, 20 L UN pails etc.



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10.0 Contact Information

Department of Environmental Health & Safety

207 Stuart Street

Rideau Building

Kingston, ON

Main Office: ext. 32999

Waste Disposal Information: ext. 74976 (Tom), 77617 (Lisa), 32951 (John)

Fax: 33078

Revision History

July 2000-Revision 1.0 Initial Release

April 2009-Revision 2.0 New Process

October 2009-Revision 3.0 Updates