Environmental Policy & Principles
In accordance with the University Safety Policy, the Department of Safety and Risk Management has established this Environmental Policy and these Principles. All members of the University are responsible for complying with this policy.

Environmental Policy
The University of Rhode Island is committed to compliance with all applicable federal, state and local regulations, to pollution prevention objectives, and to continual improvement of environmental systems.

Environmental Principles
To achieve this goal the University will adhere to the following Environmental Principles:
• Comply with all applicable environmental laws and regulations.
• Educate and train faculty, staff and students to properly implement University programs and procedures.
• Minimize University impact on the environment and surrounding community.
• Continually reduce University impact to the environment by implementation of pollution prevention and waste minimization programs.
• Monitor adherence with University programs by measurement of performance against established goals and matrices.

J. Kevin Culley, III, Director
Department of Safety and Risk Management
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1. Laboratory Waste Management

Many types of waste are generated in the laboratories at the University of Rhode Island. This guidebook contains information regarding the types of waste generated and the methods for waste handling, including the procedures to follow in the event of a spill.

The following chart identifies the roles and responsibilities for University personnel who handle laboratory waste:

1.1 Enforcement
The Laboratory Waste Management Committee is responsible for enforcement of the procedures in this guidebook. The following actions will be taken in the event of a deficiency:

- 30 days to correct the deficiency or notify the Department of Safety and Risk Management (SRM) if assistance is needed.
- If not corrected, notification of Department Chairperson, Dean, Laboratory Waste Management Committee, President’s office.
• Warning letter of enforcement action sent if deficiency is not corrected within 60 days of initial notice.
• Enforcements can include: correction by the Department of Safety and Risk Management (SRM) with costs assessed to department; closure of laboratory; loss of laboratory privileges; or others as appropriate.

2. Laboratory Safety

Precautions should be taken to avoid exposure by the principal routes, that is, contact with skin and eyes, inhalation, and ingestion.

2.1 Personal Protective Equipment
While no two laboratories are identical in the unique combination of risks present, many risks are found in nearly all laboratories. Beyond engineering and administrative controls, another level of protection is added with personal protective equipment (PPE). Because each laboratory procedure presents a unique set of hazards, reliance on PPE has become paramount.

2.11 Eye protection should be required for all personnel and visitors in all locations where chemicals are stored or used. Visitor safety glasses should be made available at the entrances to all laboratories. Researchers should assess the risks associated with an experiment and use the appropriate level of eye protection. Ordinary prescription glasses do not provide adequate protection against injury. Prescription safety glasses and goggles can be obtained.

2.12 Wear gloves whenever handling hazardous chemicals, sharp-edged objects, very hot or very cold materials, toxic chemicals, and substances of unknown toxicity. Select gloves appropriate to the chemical being used.

2.2 Proper Laboratory Apparel
Long hair and loose clothing or jewelry must be confined when working in the laboratory. Unrestrained long hair, loose or torn clothing, and jewelry can dip into chemicals or become ensnared in equipment and moving machinery. Clothing and hair can catch fire. Sandals and open-toed shoes should never be worn in a laboratory in which hazardous chemicals are in use. It is advisable to wear a laboratory coat when working with hazardous chemicals. This is particularly important if personal clothing leaves skin exposed. Apparel giving additional protection (e.g., nonpermeable laboratory aprons) is required for work with certain hazardous substances. Because many synthetic fabrics are flammable and can adhere to the skin, they can increase the severity of a burn. Therefore, cotton is the preferred fabric.
3. Chemical Waste Management

All URI personnel or students who work with, or have any connection with, chemicals in a laboratory, must manage chemical waste in a manner that is protective of human health and safety, and the environment. It is important that you review the procedures outlined in this guidebook and contact the Department of Safety and Risk Management (SRM) at 874-2618 should any questions arise.

Note: Unwanted chemicals in their original containers should not automatically be considered chemical waste. Chemicals that are unwanted in one laboratory or department may be considered usable in another laboratory or department. If you have such unwanted chemicals, refer to page 10 “Chemical Clean-Out.”

NO CHEMICAL WASTE IS TO BE DISPOSED DOWN DRAINS! Chemical waste must be characterized as non-hazardous or hazardous in accordance with the procedures outlined in this section.

4. Hazardous Chemical Waste

Hazardous Waste: A substance which exhibits one of the four hazardous characteristics (corrosivity, ignitability, reactivity, toxicity) or is specifically listed as hazardous waste by the EPA or RI.

4.1 Waste Characterization Checklist
- Is this waste included in EPA’s list of hazardous wastes? (e.g., phenol, potassium cyanide, hydrofluoric acid)
- Is it ignitable or flammable?
  - Is it a liquid with a flash point below 93°C?
  - Is it a liquid with a vapor pressure above 40 psi at 38°C?
  - Is it a liquid or a gas that has a flash point above 23°C and a boiling point below 38°C?
  - Is it a liquid that ignites spontaneously in dry or moist air or below or equal to 61°C?
  - Is it a solid or semi-solid that gives off flammable vapors below 38°C?
  - Is it a non-liquid capable of causing fire by friction, absorption of moisture or spontaneous chemical change?
  - Is it a flammable or ignitable compressed gas?
  - Is it an oxidizer that yields oxygen readily to simulate the combustion of organic matter?
- Is it corrosive?
  - Is it an aqueous solution with a pH ≤5.5 or a pH ≥9.5?
  - Is the waste capable of corroding steel?
• Is it reactive?
  o Does it react violently or become unstable with water or produces toxic gases or explosive mixtures?
  o Is it unstable or is it explosive, either readily or with a strong initiating source?
  o Does it contain cyanide or sulfides and generate toxic gases or explosive mixtures when exposed to a pH between 2 and 12.5?

• Is it toxic or extremely hazardous?
  o Does it contain contaminants found in the EPA table of toxic substances in excess of the EPA standard?
  o Does it contain a Class 2, Division 2.3 or Class 6, Division 6.1 hazardous material as defined by USDOT?
  o Does it have an LD_{50} below 5,000 mg/kg of body weight?
  o Is it a known or suspected carcinogen or a known teratogen?

Consult the website for listed wastes, and further information about waste characterization and handling [www.uri.edu/safety](http://www.uri.edu/safety)

If you answered “Yes” to any of these questions, it is a hazardous waste.  
If you answered “No” to any of these questions, it is a non-hazardous waste.  

<table>
<thead>
<tr>
<th>General Information</th>
<th>Containers</th>
<th>Labels</th>
<th>HPLC Wastes</th>
<th>Mercury Waste</th>
<th>Photographic Wastes</th>
<th>Unknown</th>
<th>Sharps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>see page</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gas Cylinders</th>
<th>Empty Containers</th>
<th>Biological Waste</th>
<th>Sharps</th>
<th>Radioactive...Call Radiation Safety 874-6126</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Hazardous Waste Containers
All hazardous waste material must be stored in an appropriate container.  
The containers must be:
• Compatible with the waste material being stored; check MSDS
• Sturdy and leak-proof
• An appropriate size
• Under the control of the person generating the waste
• Closed at all times except when adding waste, and have a tight-fitting cap
• Clearly identified with a hazardous waste label (see page 8)

Containers that previously held materials that might be incompatible with the waste to be stored (including food, beverage and detergent containers) are NOT suitable for storing waste.
4.3 Incompatible Materials
Certain hazardous wastes cannot be safely mixed or stored with other materials because a severe reaction or explosion can occur or an extremely toxic reaction product can result.

The chemical label and/or MSDS should provide information on incompatibilities. In general, hazardous waste containers should be segregated by hazard class as listed below:

- Ignitable/Flammable
- Pyrophorics
- Explosive
- Toxic
- Reactive with Water
- Reactive with Air
- Peroxide Formers
- Oxidizers
- Corrosive
- Concentrated Acids
- Concentrated Bases
- Reducers

4.4 Hazardous Waste Labels
It is the responsibility of the Scientist-in-Charge to ensure that the waste container label includes:

- The words “Hazardous Waste”
- The identity of the hazardous waste
- If the waste is a mixture, a list of all the components and the percentage of each (these should sum to 100%)
- The primary hazards presented by the waste (e.g. “toxic”, “reactive”)
- The name of the person responsible for the waste, their location and phone number

Remove or deface all extraneous container labels.

Waste Logs
Where a number of additions will be made to a waste container, a waste log may be used to record information for each addition. While being filled, the waste container must have a hazardous waste label and the label must reference the waste log. The waste log must also reference the waste container number. When the waste container is full, the information on the waste log must be summarized onto the container hazardous waste label.
5. Laboratory Hazardous Waste Accumulation Area

Laboratory Hazardous Waste Accumulation Area: An area in the laboratory where small quantities of hazardous waste are temporarily stored prior to collection for disposal by SRM. The Laboratory Hazardous Waste Accumulation Area could be a room, a bench top, or a laboratory hood.

Such accumulation areas are regulated by federal and state law. To ensure compliance with these regulations and URI requirements, the following conditions must be met:

• Mark with the words “HAZARDOUS WASTE ACCUMULATION AREA.” (supplied by SRM)
• Locate in the laboratory and under the control of the person generating the waste.
• All containers must meet the container and labeling requirements outlined on pages 7 and 8.
• Segregate incompatible substances; do not mix in the same container.
• Liquid waste containers should have secondary containment.
• No more than one container of each type of hazardous waste generated can be stored at one time.
• No more than 55 gallons of hazardous waste or one (1) quart of acutely hazardous (P-listed) waste can be stored at one time.
• Emergency response information must be posted:
  • emergency phone numbers
  • location of fire extinguishers and fire alarms
  • location of spill control materials and MSDSs
• Must contain appropriate spill control kits for chemicals used in that laboratory.

6. Pick-Up and Disposal

SRM is responsible for the retrieval, transport, and disposal of all hazardous wastes from laboratories. Full containers must be removed from the laboratory hazardous waste accumulation area within 3 days of becoming full. When a waste container becomes full, the laboratory must notify SRM immediately to schedule a pick-up.

6.1 TO HAVE WASTE REMOVED FROM THE LABORATORY:

1. Complete a “Request for Hazardous Waste Disposal” form and fax to SRM at 789-5126,
2. Call SRM at 874-2618 to confirm receipt of fax.
3. A SRM staff member will call to schedule a time to remove the waste from your laboratory.
4. The laboratory is responsible for ensuring that the waste container is properly labeled and is accompanied by a completed “Request for Hazardous Waste Disposal” form. Commercial products must also be accompanied by an MSDS.
5. A knowledgeable user will be present during pick-up to verify the contents of the waste.
6.2 Chemical Clean-Out
When chemicals that are still in their original containers need to be removed from an area (e.g. laboratory, stockroom, or storage cabinet), these procedures should be followed:
1. Inventory all chemicals present to the extent possible.
2. Complete a “Laboratory Clean-Out” form indicating the chemical names and quantities and fax to SRM at 789-5126.
3. Call SRM at 874-2618 to confirm receipt of fax and to schedule clean-out.

SRM will conduct all chemical clean-outs! NO CHEMICAL WASTE IS TO BE DISPOSED OF DOWN DRAINS!

7. Specific Handling Procedures For...

7.1 HPLC Wastes
Solvent wastes generated from HPLC equipment are subject to hazardous waste regulations. However, due to the nature of the equipment, the procedures for collection and handling of HPLC solvent wastes are different than for other chemical wastes generated in laboratories. For example, HPLC waste containers require special caps and must vent to a fume hood. Contact SRM for correct waste collection procedures.

7.2 Mercury Waste
Mercury metal must be collected for recovery and recycling. Due to its well-established toxicity and environmental persistence, it must not be released into the environment and should be handled as a hazardous waste. All waste mercury must be collected in closed containers with the words “waste mercury metal” clearly marked.

If a mercury thermometer breaks, call SRM at 874-2618 for assistance. The University of Rhode Island encourages laboratories to switch to digital or spirit thermometers to minimize mercury use.

7.3 Photographic Wastes
Each photographic process’s waste stream needs to be evaluated for disposal. Call SRM at 874-2618.

7.4 Radioactive Waste
All radioactive waste should be handled in consultation with the Radiation Safety Office. Please call 874-6126 for assistance.

7.5 Other
If you are generating a waste stream and are unsure of the waste characteristics or the collection and handling procedures, contact SRM.
7.6 Unknowns
If a chemical or waste container of unknown contents is discovered:
1. Label it as “UNKNOWN”.
2. Attach a note detailing any information about what the chemical might be, where it was found, and in what experiment it may have been used.
3. Contact SRM for assistance.

If you find any unlabeled chemical that has crystallized, or there is any other indication that it may be unstable, DO NOT TOUCH IT contact SRM immediately.

7.7 Gas Cylinders
Gas cylinders should be returned to the manufacturer or distributor whenever possible. Unreturnable cylinders and lecture bottles will be collected by SRM. Tag for disposal and complete a “Request for Gas Cylinder Removal” form. Fax to SRM at 789-5126. Order refillable/returnable cylinders instead of lecture bottles whenever possible.

7.8 Empty Chemical Containers

<table>
<thead>
<tr>
<th>Contamination Type</th>
<th>Residue Amount</th>
<th>Container Type</th>
<th>Handling Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous/Chemical/Pharmaceutical</td>
<td>Minimal/None</td>
<td>Glass</td>
<td>Ensure there are no free liquids. Remove lid. Allow residue to dissipate under hood. Remove all hazard warning labels. Put in box and seal box. Dispose of box in regular trash.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plastic</td>
<td>Ensure there are no free liquids. Remove lid. Allow residue to dissipate under hood. Remove all hazard warning labels. Dispose in regular trash.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Any</th>
<th>All</th>
<th>Handling Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Hazardous (P-Listed)</td>
<td>Any</td>
<td>All</td>
<td>Label and dispose of as hazardous waste (see page 7).</td>
</tr>
<tr>
<td>Biological</td>
<td>Any</td>
<td>All</td>
<td>Label and dispose of as biological waste (see page 11).</td>
</tr>
</tbody>
</table>

8. Biological Waste Management

**Biological Waste:** Includes biomedical and animal waste.

**Biomedical waste:** Any waste that is potentially biohazardous, infectious or pathological. Biomedical waste includes sharp materials (sharps- see page 12), and biomedical debris.

**BIOMEDICAL DEBRIS** includes infectious human and animal blood, body fluids and tissue, culture flasks, and any items such as gloves, disposable safety glasses and plastics that are heavily soiled with biomedical materials.

- Place biomedical waste in rigid container that is lined with red biohazard bags, (all bags and containers are provided by SRM).
- Ensure packaged waste is within weight limits indicated on container.
• When bag is full, double tape it.
• Label outer bag with the University’s ID labels provided by SRM.
• Securely close container; triple tape all seams.
• Immediately notify SRM that container is ready for pick-up.

**Animal Waste:** Expired animals used in research or teaching. Animal waste should be packaged, labeled and handled in the same way as biomedical waste with the following added procedures:

• In addition to all biomedical waste labeling, a yellow “ANATOMICAL/PATHOLOGICAL WASTE” label must be stuck on the outside of the biohazard box
• Animal waste should remain frozen until pick-up is scheduled

### 9. Sharps

**SHARPS:** waste items that can easily cut or puncture the skin, such as needles, syringes, broken pipettes, scalpels, broken vials and laboratory slides.

Segregate sharps by contamination type (biological, hazardous, radioactive). Unused sharps will always be considered biological. If unsure of the contamination type, contact SRM.

If sharps are considered biological only:
1. Place sharps in red OSHA-approved sharps containers, provided by P.I.
2. Place a biohazard label and the University’s ID label on the sharps container. Labels provided by SRM.
3. Place the sharps container in the lined biological waste container.

If sharps are considered hazardous and biological:
1. Place sharps in red OSHA-approved sharps containers, provided by P.I.
2. Place a biohazard label and the University’s ID label on the sharps container. Labels provided by SRM.
3. Place a “Hazardous Waste” label on the sharps container next to the biohazard and University ID labels.
4. Consult with SRM for disposal procedures.

If sharps are considered radioactive or mixed radioactive (i.e. radioactive and hazardous/biological): • Call the Radiation Safety Office at 874-6126.

### 9.1 Non-biological, non-hazardous broken laboratory glassware
(i.e. broken glassware, such as bottles, flasks, pipettes, and vials that do not meet the criteria for hazardous, biological, or radioactive waste):
1. Place in a box and securely seal the box.
2. Label the box “broken glassware”.
3. Place the box in the regular trash.

**Laboratory glassware must never be discarded in the aluminum or glass recycling bins.**
10. Chemical Spill Emergency Response

The following steps should be taken in the event of a chemical spill:

**EVACUATE:**
- Alert others in the area and direct/assist them in leaving
- Without endangering yourself: Remove injured to fresh air, remove contaminated clothing and flush contaminated skin and eyes with water for 15 minutes. If anyone has been injured or exposed to toxic chemicals or vapors, call 4-2121 and seek medical attention immediately.
- Leave the spill area

**CONFINE:**
- Close all doors and isolate the area.
- Prevent people from entering the spill area.

**REPORT:**
- From safe place, call 4-2121
- Report the emergency and give:
  - Your name, location and phone number
  - Location of spill
  - The name and amount of the material spilled
  - The extent of the injuries
  - The safest route to the spill
- Stay by the phone.
- Emergency services will respond to stabilize spills or clean up and provide medical attention.

**SECURE:**
- Until emergency response personnel arrive; block off the areas leading to the spill.
- Post personnel near commonly-used entrances to the area to direct people to use other routes.
- Notify supervisor.

**EMERGENCY RESPONSE**
Call 4-2121
11. Internet Resources

University of Rhode Island
URI Department of Safety & Risk Management
www.uri.edu/safety

URI Radiation Safety Office
www.uri.edu/research/rso

Regulatory Agencies
Rhode Island Department of Environmental Management
www.state.ri.us/dem

EPA Laws and Regulations
www.epa.gov/epahome/rules.html

National Institute for Occupational Safety and Health
www.cdc.gov/niosh/homepage.html

MSDSs/Chemical Information
International Chemical Safety Cards
www.cdc.gov/niosh/ipcs/ipcsname.html

MSDS Search
www.msdsssearch.com

EPA Method for Determining the Compatibility of Chemical Mixtures Chemical Compatibility Chart
www.unl.edu/environ/hazard/compchrt.htm

Incompatibility of Common Laboratory Chemicals
www.orcbs.msu.edu/chemical/agricultural/incompatible.html

Laboratory Safety
Office of Laboratory Safety of the Howard Hughes Medical Institute
www.hhmi.org/science/labsafe

Links to Safety Sites on the Internet
www.hazard.com/links.html
12. Laboratory Pollution Prevention

Pollution: discharge of harmful substances to environmental media (air, soil, or water) resulting in concentrations that interfere or change the natural processes.

Pollution Prevention: the reduction or elimination of pollution at the source when raw materials, waste energy, and other resources are efficiently utilized, when less harmful substances are substituted for hazardous ones, and when toxic substances are eliminated.

University laboratories often generate large quantities of wastes through instructional and research activities. Pollution prevention practices can reduce overall operational and environmental compliance costs while reducing student and researcher exposure to hazardous materials.

The University of Rhode Island is committed to pollution prevention using the EPA’s hierarchy of preferred options: Source Elimination and Reduction, Recycling and Reuse, Treatment and Disposal.

13. Training

Environmental training is conducted on several levels. Please review the matrix below to ensure that you attend the appropriate class. Your diligence in completing these courses is necessary in order to make this program successful. Brief descriptions of each class are presented below.

Class 1 - Environmental Awareness / Initial Waste Management
This class provides basic environmental awareness training, which outlines procedures and responsibilities, and the importance of proper waste handling. Topics include labeling, containment methods, hazard recognition, waste collection, and emergency response. This class is mandatory for University personnel who could potentially handle laboratory waste and must be completed within 30 days of working in a laboratory where chemical or biological waste could be generated. This class is presented by SRM. Call PSPD to register for a class, 874-5199.

Class 2 – Refresher: Prudent Practices and Laboratory Waste Management
All University personnel who potentially handle laboratory chemical or biological waste must attend annual training to refresh the material learned in Class 1. This class is presented by SRM. Call PSPS to register for a class, 874-5199.

Class 3 - Waste Management for Students
This class provides basic environmental awareness training, outlining academic laboratory procedures and responsibilities, and the importance of proper waste handling. Instructors will teach this class at the beginning of each laboratory course where chemical or biological waste will be generated. Instructors will also provide this training to students that enter the class mid-semester. This class is presented by the individual departments.
14. What You Must Do To Comply

Below are the minimum steps you need to take in order to comply with federal and state regulations regarding waste handling and spill emergencies:

The Top 10 Guidelines for Environmental Responsibility
1. Attend environmental training.
2. Properly label waste containers.
4. Segregate incompatible waste.
5. Use secondary containment for liquid waste.
6. Keep waste containers closed at all times.
7. Do not dispose of hazardous waste by evaporation, sewer or trash.
8. Notify 4-2121 in the event of a chemical spill.
9. Use pollution prevention techniques. (Reduce, Reuse, Recycle).
10. If you have questions call SRM.

Preventing Regulatory Violations
Federal and state agencies regularly visit URI to perform unannounced inspections. Following is a list of commonly-cited violations that the agencies find in research facilities:

- Improper labeling
- Incompatible wastes stored together
- Improperly trained personnel container
- Containers not closed
- Laboratory personnel unaware of proper emergency procedures
- Improperly contained waste
- Chemicals improperly disposed of
- Waste incompatible with container

Please review this information carefully and correct any problems in your area immediately. Violations can not only result in fines, but adversely affect URI’s public image, as well as your own reputation.

SRM personnel will conduct regular laboratory inspections to monitor compliance. The Scientist-in-Charge will be notified of any deficiencies and will receive a copy of the inspection report.

Important Phone Numbers

Safety and Risk Management: Radiation Safety Office:
Voice: 874-2618 Voice: 874-6126
Fax: 789-5126
SRM Website: www.uri.edu/safety University Police &
SRM Email: SRM@etal.uri.edu Security: 874-2121