The purpose of this policy is to ensure that all hazardous materials, lab equipment, etc. is properly decontaminated, disposed, etc. prior to departure or relocation whenever a researcher or student (those who work with hazardous materials) retires or otherwise leaves the University or changes laboratory locations within the University. Information on proper transport of research chemicals and biological agents on campus is also included in this Policy.

This policy applies to all Clemson University laboratories, darkrooms, storage rooms/buildings, or any area where hazardous materials are stored or used.

The Lab Check Out Form (Appendix C) must be filled out and signed by the appropriate personnel as indicated.

Once the Lab Closeout has been verified by Research Safety, a signed Lab Closeout Release Certification will be posted on the outside lab door indicating that the lab has been properly closed out.

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CHEMICALS

GENERAL

- All chemicals must be disposed according to the CU Hazardous Waste Management Manual which can be found on the Research Safety website: http://www.clemson.edu/research/safety
- Check refrigerators, freezers, chemical hoods and bench tops as well as storage cabinets for chemical containers.
- Determine which chemicals are usable and relocate/transfer responsibility for these materials to another researcher who is willing to take responsibility for them. If chemicals will be moved to another laboratory, ensure that the policy "Movement of Laboratory Owned Research Chemicals" is followed. This policy is attached in Appendix B.
- If a new user cannot be found, the materials must be disposed of properly (see 1st bullet above).
- Assure that all waste containers of chemicals are labeled with the name of the chemical(s). Hazardous waste labels are available through the Office of Research Safety Hazardous Waste Management Facility and can be found on the Research Safety website.
- Abbreviations or chemical symbols are not acceptable labeling.
- All containers must be securely sealed and not leaking.
- All containers (beakers, flasks, etc.) must be emptied (contents must be properly disposed) and cleaned.

Laboratories and research areas should utilize the university hazardous waste disposal service to maintain a minimal amount of hazardous waste and to prepare for a closeout.

For lab closures, at least two week’s notification must be given to the Office of Research Safety’s Hazardous Materials Manager if any hazardous materials need to be removed or disposed of as hazardous waste. Disposing of hazardous materials, liquids or solids, via the drain, trash or venting in the fume hood is not allowed.

Department Chairs are responsible for ensuring Principal Investigators (PIs) follow all institutional guidelines for the closeout of laboratories and the disposal of hazardous materials. Failure to adhere to these guidelines can result in the Department being held financially responsible for all costs incurred for the safe management and disposal of hazardous material wastes left behind.

CONTROLLED SUBSTANCES

- Transferring ownership of a controlled substance to another licensed individual must be recorded in writing.
- If controlled substances are relocated, DEA must be notified in writing of new location.
- If a controlled substance(s) is distributed to another person, their name, address and DEA registration number must be recorded in the substance(s) continuing record, along with date and number of units distributed. Records must be kept.
• Contact Office of Research Safety Hazardous Materials Manager, June Brock-Carroll juneb@clemson.edu to obtain information on proper disposal methods. The DEA must be notified prior to disposal.
• If a controlled substance(s) is disposed of, include date, manner of disposal, and quantity of substance disposed. Keep all disposal records.

COMPRESSED GAS CYLINDERS

• Remove gas connections, replace cylinder caps, and return cylinders to suppliers.
• Any compressed gas cylinder being moved must be secured on an appropriate cylinder cart.
• Small lecture bottles must be properly packed as bottles.
• Compressed gas cylinders should be transported from floor to floor on freight only elevators with no occupants.
• Cylinders should always be leak tested before being placed onto the elevator.
• If a passenger elevator must be used, the elevator must be posted “transporting compressed gases—“NO passengers”. Assure that the cylinder is properly secured to a stable cylinder cart before placing it onto the elevator.
• Someone must be waiting at the designated floor to remove the cylinder from the elevator. If there are floors between the floor where the cylinder is placed onto the elevator and the floor where it will be retrieved, personnel should be staged at the elevator on those floors to ensure that no one gets onto the elevator until the cylinder has been removed.
• If cylinders are non-returnable, consult the Hazardous Waste Office in the office of Research Safety for disposal.
Biological Materials

When closing out a biological lab, the following things should be considered:

- No biological items shall be left in the lab unless they are being transferred to another researcher that will subsequently be taking over the lab. All of these items must be disclosed to the new researcher and confirmation of this should be given to the Biological Safety Officer (BSO). If the biological items are not transferred to a new lab or left or the new researcher, they must be disposed of as biological waste.

- All infectious waste must be disposed of properly. There shall be NO infectious waste remaining in the lab regardless of who will be occupying the lab subsequently. The Biological Waste pick up request form for declaring waste can be found at this address: [http://www.clemson.edu/research/safety](http://www.clemson.edu/research/safety)

- All select agents must be declared to the Responsible Official (RO) and the Biological Safety Officer so that they can determine the fate of these agents. These must not be transferred to another researcher without the consent of the RO and the BSO.

- If the researcher is moving to another lab, either on campus or in an off-campus facility, the guidance given in the Biological Materials Transport Policy (Appendix C of the Biosafety Manual) must be followed.

- All Biological Safety Cabinets (BSCs) must be decontaminated prior to being moved or if they are going to remain in the lab being closed. If the BSC is moved to a new location, it must be recertified before use. If research similar to what has been conducted in the lab being closed will be continued by the next researcher AND the BSO and new researcher agree that the BSC is OK to continue to use as is, decontamination might not be necessary.

- All surfaces and equipment must be decontaminated with an EPA List E disinfectant such as 70% ethanol or 0.5% sodium hypochlorite

- All biohazard stickers and signs must be removed from entrances and equipment unless the stickers and signs will be used by the next researcher. Approval to leave these in place must be obtained from the BSO and the new researcher.

If there are any questions regarding the fate of any biological material or equipment used in biological research, please contact the BSO by email: biosafety@clemson.edu
Radioactive Materials

General

Radioactive materials are possessed and used by University personnel within the authority of a radioactive materials license, issued by the state of South Carolina DHEC (department of health and environmental health and control) through its Bureau of Radiological Health. This license restricts possession and use of radioactive materials to qualified personnel (Authorized Users) at discrete locations (authorized places of use), which are approved by the University’s Radiation Safety Committee and the Radiation Safety Officer.

If, for any reason, radioactive materials are removed from the authorized place of use, or if the authorized user should separate from the University, certain steps shall be taken in order to return the previously authorized use area to an unrestricted area, free of radioactive materials or radioactive contamination. Prior to close out of a radioactive materials area the following steps must be taken.

- Notify the Radiation Safety Officer as soon as the intent to vacate is known – preferably thirty days in advance.
- Make arrangements with Radiation Safety to remove all radioactive materials including waste from the laboratory.
- Survey the laboratory and decontaminate any contaminated areas as necessary. Coordinate any decontamination efforts with the radiation safety office.
- NOTE: Areas of potential residual contamination may include refrigerators and freezers, centrifuges, water baths, hoods, sinks, floor areas under waste containers, etc.
- Do not remove any of the signs, stickers, or postings. Contact Radiation Safety at 656-3516 or kpovod@clemson.edu to schedule a final closeout survey.

If the laboratory is being vacated because the researcher is leaving the University, the following additional steps must be followed:

- Usage records, including Survey Records, must be updated, finalized and submitted to Radiation Safety.
- Waste disposal records must also be finalized and turned in.
- All radioactive material waste containers must be removed/picked up by Radiation Safety.
- Personnel dosimeters must be returned to Radiation Safety.
- Termination bioassays must be performed if applicable.

For questions or assistance please call Radiation Safety at 656-3516

Radioactive materials, contaminated equipment, or equipment that is capable of producing ionizing radiation may be transferred to another facility, which is licensed to possess such materials, by the U.S Nuclear Regulatory Commission or by another agreement state. The transfer of licensed materials shall be under the direction of the RSO. Prior to shipment/transfer of the material, the RSO shall have a current copy of the radioactive materials license that authorizes the Institution, facility, or individual who will be in receipt of any licensed material prior to shipment from the university.
**Radiation Producing Devices**

Possession and use of equipment capable of producing ionizing radiation (x-rays), is also controlled by the South Carolina DHEC. If such equipment is taken out of service for repair, replacement, or for disposal, the RSO must be notified. The RSO must be notified prior to removal of x-ray equipment from a laboratory or other authorized place of use.

It is unlawful to operate equipment capable of producing ionizing radiation unless the machine is registered with the Bureau of Radiological Health and the individual who operates such equipment has been approved by the Bureau. The RSO will notify the Bureau of Radiological Health if an x-ray producing device is taken out of service or if the authorized place of use is to be moved. X-ray machines that are permanently taken out of service or disposed shall have the x-ray tube removed by the RSO so that the device is incapable of producing ionizing radiation in the future.

**Lasers**

Class 3b and class 4 lasers are to be used in areas approved by the RSO and operated by personnel who have received training specific to operation of the laser in question. As is the case with x-ray devices, the approved laser user shall notify the RSO of his/her intent to move a laser use area or remove a laser from a laboratory prior to doing so - preferably thirty days in advance.
Laboratory Equipment

- All equipment must be disinfected and decontaminated by lab staff and certified as clean and safe for handling. This will include, but not be limited to, all chemical hoods, refrigerators, freezers, centrifuges, biological safety cabinets, incubators, ovens, countertops, cabinets etc.
- Biological safety cabinets must be decontaminated prior to being relocated. Please contact the Biological Safety Officer for information.
- Equipment that will not become the responsibility of another faculty member or the department must be taken to surplus or properly disposed as necessary (contact the office of Research Safety if you are not certain of the appropriate action)

Laboratory Supplies

- Glassware, if non-contaminated, should be collected in sturdy, puncture-resistant containers; all glassware must be empty and all labels must be removed or obliterated; containers must not be overfilled—no glass should ever be protruding from the container. Dispose when glassware is within a few inches of the top or when the weight of the container reaches a safe maximum weight for lifting based the person(s) who will be carrying it to the dumpster. **DO NOT** place glassware in laboratory receptacles used for collection of general waste (i.e. paper, plastic).
- If glassware/container has held acutely toxic chemicals, it must be triple-rinsed and then disposed of as hazardous waste; container may then be disposed with general glassware.
- Containers with “biohazard” or biohazard symbols may **not** be used for disposal of general glassware.
- Keep the bottom of the box dry (check before lifting to ensure that the container will remain intact when lifted).
- Seal/tape the box securely and dispose in dumpster.
- All needles, vacutainers, scalpels etc., must be placed into sharps boxes for disposal through Research Safety.
- **DO NOT** place glass or sharps (syringes, scalpels, etc) into regular trash.
- Usable, non-contaminated laboratory supplies may be transferred to other researchers.
- Contaminated glassware and lab equipment that cannot be decontaminated must be disposed as hazardous waste.

Shared Areas

All chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas must be properly disposed/removed unless other faculty member(s) agree (in writing) to assume responsibility for the materials. These shared spaces will include labs, equipment rooms, storage areas, cold rooms, dark rooms, autoclave rooms, shared laboratories, etc.
Appendix A

Telephone Numbers

Office of Research Safety  656-0341
Biological Safety Officer   656-7686
Hazardous Materials Manager  633-6357
Radiation Safety Officer   656-3516

Fax: 656-3599

Research Safety website:  www.clemson.edu/research/safety
Appendix B

Policy: Movement of Laboratory Research Chemicals (within CU Campus)

Purpose: To ensure the safe handling and movement of research chemicals from lab to lab and building to building. This does not affect the movement of new chemicals being delivered.

Departmental faculty/staff may move chemical bottles from one laboratory to another laboratory if the following conditions are met:

*Please note that specific regulations (e.g. DOT, OSHA BBP, CDC, IATA) must be observed when shipping or transporting hazardous materials outside of core campus.*

- Staff who will be doing the moving of the bottles must be trained in the proper handling of chemicals.
- Containers must be in good condition and must be properly closed/sealed.
- Chemical bottles or containers are adequately labeled (full chemical name and associated hazard(s)).
- It is preferable to use crates or sturdy poly-type containers. If boxes are used to move chemicals, ensure that they are in good condition and are sturdy enough to handle weight of the bottles of chemicals.
- Crates, boxes, etc. should not be excessively large to prohibit overloading or safe handling.
- Bottles of chemicals are segregated and packed into boxes by hazard class. Non-compatible chemicals may not be packed or moved in the same box. (contact the Office of Research Safety for further information.)
- Glass bottles and all bottles containing liquids will be packed in boxes with a buffer of vermiculite or other similar absorbent material.
- Plastic or unbreakable bottles of powdered or non-liquid chemicals may be packed with compatible chemicals, without absorbent material.
- Each box of chemicals will be inventoried for contents as it is being packed. Required information will include chemical name, number of bottles and quantity in each.
- Boxes must be labeled distinctly with a corresponding inventory page.
- Copies of the inventory must be kept in each box, with the moving crew and in the originating lab.
- Carts used to move boxes must be sturdy enough to handle weight of the boxes and terrain it will be moved over.
- Adequate spill control material must be available for use by the moving crew. If the boxes are being moved between buildings, the spill control material must be available on the vehicle in use.
- Adequate personal protective equipment (PPE) must be available for the moving crew in the event of a spill. Staff must be trained in the proper method of use of the PPE.
- An updated chemical inventory for the originating lab (showing the removal of the chemicals) and the receiving lab (showing the receipt of the chemicals) must be completed and kept on file in each of the respective labs and mailed to Clemson University Facilities Environmental Safety.
- Safety data sheets for each hazardous chemical must accompany the chemical.
- Appropriate personal protective equipment (safety glasses, clean gloves, lab coat etc.) as required must be worn when transporting chemicals.
- Chemicals should be moved only from point A to point B—no stops in between (offices, restroom, etc.)
- Chemicals must always be under the control of the responsible person(s); never chemicals unattended in corridors or other areas outside the lab.
- Chemicals **may not** be transported in personal vehicles.
Appendix C
Research Safety
Laboratory Close-out Checklist

Building: ______________ Room: ______________ Department ______________

Responsible Researcher(s): ________________________________________________________________

Contacts: __________________ Phone/email: _________________________________

Lab is relocating: Yes ____ No ____ If so, to: Building ______________ Room Number ______________

Lab has been re-assigned at this time: ____ Yes ____ No
Lab ownership is being transferred to: ____________________________ Phone number: ____________

### Chemical Safety

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Chemical hoods have been cleared of all chemicals and equipment?</td>
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<td></td>
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<tr>
<td>Chemical hoods have been cleaned/decontaminated?</td>
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<tr>
<td>Was perchloric acid used in any hood/exhaust device in this lab?</td>
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<tr>
<td>All signs (hazard, caution, etc.) removed where appropriate?</td>
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<tr>
<td>All chemicals and controlled substances have been removed or disposed</td>
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<td>according to CU policy?</td>
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<td>Gas cylinders have been removed according to CU policy?</td>
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<tr>
<td>Shelves and cabinets have been cleared and cleaned/decontaminated?</td>
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<tr>
<td>Countertops have been cleaned/decontaminated?</td>
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<tr>
<td>Remaining equipment has been properly cleaned/decontaminated?</td>
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<tr>
<td>Refrigerators and freezers cleaned/decontaminated?</td>
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<tr>
<td>Emergency contact and hazard information changed on lab door(s)?</td>
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### Biological Safety

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Inside of the BSC has been properly decontaminated?</td>
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<tr>
<td>Incubators/water baths have been properly decontaminated?</td>
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<tr>
<td>Biohazard areas have all been properly decontaminated?</td>
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<tr>
<td>All biological waste has been removed/properly disposed?</td>
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<tr>
<td>All biological materials have been properly disposed or transferred?</td>
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<tr>
<td>All biohazard stickers have been removed?</td>
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</table>

### Radioactive Materials

All Radioactive materials have been properly removed as directed by the University Radiation Safety Officer? _____ Yes _____ No _____ N/A

All equipment, glassware, lab benches, etc. have been properly decontaminated? __ Yes __ No ____ N/A

Lab has been surveyed/cleared of all Radiation Safety issues by ______________ (CU RSO)
Date: _______________________

*Please have appropriate personnel provide signatures on the following page before submitting.
If the lab is primarily a Biological Research Lab, send this completed form to the University Biosafety Officer, Kerri Kwist (kkwist@clemson.edu); otherwise, send the form Research Safety, (researchsafety@clemson.edu). Final lab inspection will be conducted by appropriate Research Safety personnel. When all lab close out requirements in the lab have been satisfied, the form will be signed and a copy provided to you for your departmental records.
Lab Closeout Release Certification

This Laboratory Space has been examined and cleared by the appropriate Research Safety Unit and is ready to be reoccupied or renovated:

Lab Location: ______________________

Department: ______________________

Radiation
Name____________
Date___________

Hazardous Materials
Name____________
Date___________

Biohazards
Name____________
Date___________

For questions contact ORS at 656-0341 or online at http://www.clemson.edu/research/safety/askRS.htm