Guidelines for Decommissioning or Relocating a Laboratory and Hazardous Materials on Campus

Environmental and Occupational Health Support Services (EOHSS)
Gilmour Hall 304 – Extension 24352
Home Page: https://hr.mcmaster.ca/employees/health_safety_well-being

October 2020

GUIDELINES FOR DECOMMISSIONING/RELOCATING A LABORATORY AND HAZARDOUS MATERIALS ON CAMPUS ONLY

This guideline contains safety and reference information for the physical relocation of or disposal of hazardous materials and is primarily written for faculty and staff who are relocating a laboratory or decommission a lab. This should not be considered a substitute for referencing Safety Data Sheets (SDSs) and following regulatory guidelines.

Facility Services should be utilized to assist with the move. EOHSS and FHSSO can be contacted as required for inquiries.

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Laboratory Decommissioning Checklist

Principal Investigator: _____

Department: _____

Building/Room: _____

Email: _____

Extension: _____

Action	Date Complete or N/A	Initials
All chemical, bio hazardous and radioactive materials have been removed from the lab (includes gas cylinders)		
All hazardous waste disposed of as appropriate		
All surfaces cleaned and decontaminated		
Fume hoods cleaned and decontaminated		
Hazard signage removed from doorway and any other areas of the lab		
All equipment remaining in the room (refrigerators, flammable cabinets, etc) removed or tagged as hazard free		
All glassware is clean and decontaminated or removed from the lab		
Sharps and broken glassware disposed of as appropriate		
If applicable, advise Health Physics and Bio Safety Office		

Principal Investigator:

Signature: _____ Date: _____

Department Chair

Signature: _____ Date: _____

PREPARATIONS PRIOR TO MOVING

Who will move hazardous materials and how?

For transfer of chemicals off site contact EOHSS or FHS if located in MUMC or other off-site location. Contact Health Physics for radioactive materials. Contact the McMaster Biosafety Office for transfer of biological materials to new locations. **Facility Services will assist with moves on main campus**.

Contacts

- EOHSS (eohss@mcmaster.ca) ext. 24352
- FHS Safety Office (fhsso@mcmaster.ca) ext. 24956
- McMaster Biosafety Office (mbso@mcmaster.ca) ext. 23453
- Health Physics (hphys@mcmaster.ca) ext. 24226
- Facility Services (clerks@mcmaster.ca)ext. 24740

Deciding what items should or should not be moved to the new facility

- Survey existing chemicals and equipment within the laboratory.

Chemicals

Unwanted Chemicals

- Review RMM #502 **Hazardous Waste Management Program** https://hr.mcmaster.ca/app/uploads/2019/01/RMM-502-Hazardous-Waste-Management-Program.pdf
- Contact EOHSS or FHSSO for disposal of chemicals- a cost will be associated for disposal
- Chemicals destined for waste must be tagged with yellow chemical waste labels, inventoried on a chemical waste disposal record, and scheduled for disposal prior to the move. EOHSS or the FHSSO can been contacted for disposal advice. Ensure the chemicals are delisted from the HECHMET Chemical Inventory. https://hr.mcmaster.ca/employees/health_safety_well-being/our-safety/lab-safety/mcmaster-chemical-inventory-system/

Wanted Chemicals

- Chemicals known to be peroxide forming or explosive are not to be moved, contact EOHSS or the FHSSO for disposal arrangements
- All chemicals shall be properly labelled and inventoried
- Once moved to the new location, ensure the HECHMET Chemical Inventory has been updated to reflect the new location and or PI associated with these chemicals.

Equipment

Unwanted Equipment

- Contact Facility Services to dispose of unserviceable equipment and other items that will not be used – an account number will be required DO NOT LEAVE ITEMS IN THE HALLWAYS OR ON THE LOADING DOCK OF BUILDINGS
- Ensure that lab equipment is cleaned/decontaminated prior to removal by Facility Services
- Old refrigerators must be emptied, decontaminated and labelled "Clean -For Disposal" and Facility Services contacted for removal (arrangements will be made for refrigerants to be removed and disposed of properly).

In the **Faculty of Health Sciences** to dispose of or to recycle scientific equipment, complete the release form for scientific equipment and return to the FHS Safety Office via email to fhsso@mcmaster.ca. Forms are available here.

Wanted Equipment

- Ensure special handling arrangements have been made for heavy equipment, equipment containing hazardous materials, and delicate equipment
- Health Physics must be contacted to determine if there is contamination of equipment in radioisotope labs prior to a move (even if no radioisotopes are currently in use)
- Assess whether the equipment needs decontamination before moving (oil/liquids drained, cavities rinsed and clean, surfaces rinsed and cleaned, ice removed from refrigerators and freezers)
  Assess whether the equipment needs to be re-certified after moving (biological safety cabinets, scintillation counters, gas chromatographs)

Gas cylinders

- Ensure that the regulators of all gas cylinders have been removed and all cylinders are capped.
- Empty cylinders should be labelled empty (or MT). Call the supplier for pick-up or place in Empties Cage if available at the building location.
- Due to the very high cost of disposal of most toxic gases, cylinders should be returned to the vendor whenever possible. Contact the vendor for guidelines on preparing the cylinder for return.
- Contact EOHSS or the FHSSO for cylinders with unknown contents or if the manufacturer will not take the cylinder back. EOHSS or the FHSSO will obtain a quote for disposal of the cylinder and then arrange for disposal

Radioisotopes

Contact the Health Physics Office for assistance in setting up, or vacating a radioisotope laboratory, or for removing any equipment from a radioactive control area. Appropriate labeling and documentation must be completed prior to moving equipment. Further instruction is available within this section. Contact Health Physics well in advance of the move to ensure that the proper documentation is completed in time.

Prior to moving radioactive materials to other on campus locations, the radioisotope permit must be amended to add the new location(s) and delete the old location(s). New locations must meet the R-52 specifications

NO MOVE OF RADIOACTIVE MATERIALS CAN TAKE PLACE WITHOUT PRIOR LICENSING CHANGES AND CHECK OUT INSPECTION. Contact the Health Physics office to arrange a check out inspection. To move materials off campus, arrangements must be made through the Health Physics Office. Be aware that decontamination may be costly and time consuming. Allow sufficient time for evaluation and decontamination **BEFORE** the move date.

Vacating a radioisotope laboratory

Dormant status

- if radioactive work is being interrupted for a short time, or the lab is being vacated but will be used for radioisotope work in the future, the lab may be designated "dormant" after the following procedures are accomplished:
    - A contamination survey conducted by Health Physics confirms that:
    - Radioactive contamination on all working surfaces does not exceed 5 Bq/cm2
    - Radioactive contamination on all non-working surfaces and equipment does not exceed 0.5 Bq/cm2
- It is the responsibility of the user who is vacating the lab to decontaminate until the levels are acceptable. Contact Health Physics if you require assistance with this process.

- A "Dormant Status Report" will be issued and posted in the lab by Health Physics. The lab may remain on the radioisotope permit, stock solutions may be stored, and radioactive signs will remain in place, but the radioactive waste containers must be removed.

Decommissioned Radioisotope Laboratory

- a radioisotope lab being vacated, and which is intended for unrestricted use in the future must:
    - Have a decontamination survey conducted by Health Physics, which confirms that contamination on all surfaces and equipment does not exceed 0.5 Bq/cm2
    - Receive a decommissioning report stating that the lab can be assigned to unrestricted use.

  The lab will then be removed from the permit and all signage for radioactive use will be removed or defaced.

  Note: it is the responsibility of the user(s) who are vacating the lab to conduct decontamination until the remaining values comply with the above limits. Help from Health Physics can be requested.

Removal of Equipment from radioactive control work and storage areas

- Equipment intended for future radioactive use

- Equipment once used in radioactive control areas, especially counting equipment, centrifuges, refrigerators and freezers, must be approved by Health Physics before removal.
- An Approved for Removal label will be attached by Health Physics when contamination is less than 5.0 Bq/cm2. The item can then be moved to another radioactive control area or radiation laboratory.
-

Equipment intended for future non-radioactive use or disposal

- Equipment once used in radioactive control areas, especially counting equipment, centrifuges, refrigerators and freezers, must be approved by Health Physics before being disposed of or repurposed
- An Approval for Disposal label will be attached by Health Physics when contamination is less than 0.5 Bq/cm2. The item can then be moved to an unrestricted use area or lab or may be disposed.

Radioactive waste

Radioactive waste should be packaged, prepared for disposal and stored according to the Health Physics Manual. If you need radioactive waste picked up or information on waste packaging, call the Health Physics Office at 24226.

Disposal into the common trash

Review RMM#502 **Hazardous Waste Management Program**. Be careful about what you put in the trash. Follow department guidelines and published information for garbage disposal and recycling.

- Dispose of only non-hazardous (non-WHMIS regulated) materials in the trash, such as sugars and some salts, powdered detergent, protein mixes, etc.
- Do not put broken glass in the trash.
- Seal broken glass in a puncture-resistant container such as a sturdy box with plastic liner to prevent custodians from being injured or purchase such boxes. Label these containers as broken glass.
- Do not place clean or dirty needles, syringes, scalpel blades etc. in the common trash; place them in a “sharps” container and dispose into biohazardous waste or hazardous chemical waste streams accordingly.
- Triple rinse empty glass chemical bottles and collect the initial rinse for chemical waste disposal. Set aside empty chemical containers with chemical waste for delisting from the HECHMET Chemical Inventory on Tuesdays by the University chemical waste company
- After delisted by the University waste removal company, remove the caps and fully deface the label prior to disposal in glass waste containers. If putting in hall for removal by custodians, a green label indicating it has been decontaminated must be on the bottles (contact EOHSS or FHSSO for labels)
- **DO NOT** dispose of biological waste, hazardous waste, radioactive waste or containers labelled with the international biohazard or radioactive symbol in common trash

Review Lab

- Review the entire lab to ensure that all chemicals have been accounted for. Nothing should be left in the lab. Some biological items cannot be transferred to others without government approval. Please check your import permits, dossiers and written authorizations for your biological inventory.
- All hazardous materials are to be removed from the existing lab and relocated or disposed of appropriately.
- If at any time the identification of a product is unknown do not touch. Contact EOHSS or FHSSO

PRE-CHECK OF THE NEW AREA

Evaluating the new area (before you move):

- Does the ventilation in this area comply with requirements for your type of research and/or equipment (example: no recirculation of air, negative/positive pressures etc.)
- Are fire extinguishers readily accessible
- Are there areas to secure compressed gas cylinders.
- Plan where you will place large items - ensure you are not blocking aisles or electrical panels
- Determine if there are enough electrical outlets and if not, where you need them (extension cords are not substitutes for properly wired receptacles and **cannot** be used for permanent use)
- If hazardous chemicals are to be used, make sure there is a safety shower, eyewash, fume hood, flammable liquids cabinet, acid/base cabinets and appropriate spill kits as necessary in the laboratory.
- Determine if enough flammable storage cabinets are available for the storage of flammable materials.
- Are controls in place for hazardous gases (gas cabinets; alarms; sensors etc.)
- Are the fume hoods functioning and have they been certified within the past year?
- Plan a storage area for your chemicals.
- Plan a designated area for collecting unwanted hazardous materials ready to be moved to the waste collection area.

Consider the following when planning the space:

Chemical storage plan

Incompatible materials must be segregated and stored separately in compatible groups. EOHSS/FHSSO can supply guidelines that outline some basics of chemical storage. Hazard classification information helps in identifying storage groups, however, be aware that there are many materials in the same basic class that have specific incompatibilities

Biohazard storage

Biohazard users must update the McMaster Biosafety Office at mbso@mcmaster.ca with regards to the new location.
You can also schedule an inspection once the new lab has been set up by calling the Research Safety Compliance Auditor (ext. 22950). Access doors to regulated areas containing infectious substances must be posted with warning signs, contact the Auditor if you need, or are not certain about the type of signage required.

Setting up a radioisotope laboratory

To commission a radioisotope lab contact Health Physics at ext. 24226 or hphys@mcmaster.ca .

- Radioisotope Permits - are issued by the Health Physics Advisory Committee and are required for storage and use of radioactive isotopes. Each storage and use location must be approved and designated on a valid HP AC Permit.
- New Radioisotope Laboratories - must meet the regulatory standards set out by the Canadian Nuclear Safety Commission in Regulation R-52. R-52 also includes construction standards.
- Dormant Radioisotope Laboratories - must be re-activated by Health Physics before radioactive isotopes can be introduced, used or stored in the lab.

All areas where radioisotopes are to be used should be delineated. All storage areas of materials and waste must be labelled with a "CAUTION RADIOACTIVE MATERIALS" sticker or sign.

MOVING DAY

Use of personal vehicles for transporting anything hazardous, on or off campus, is prohibited.

Handling Hazardous Materials During the Move

Take the following precautions to avoid mishaps:

- Pack bottles securely into boxes
- Avoid lifting containers or bottles by the cap.
- Do not stack boxes too high on carts. Do no overload boxes. Ask for assistance if needed.
- Don't lift too much. If in doubt, ask for help.
- When you lift boxes, support them from underneath. Don't lift them up by the sides or the box bottoms may split open
- Use a cart designed appropriately for this type of load.
- Use the elevator when transporting chemicals; avoid using the stairs

Who should be handling your hazardous materials?

Transportation of hazardous materials by vehicle can only be performed by Facility Services. This must be arranged prior to the move through a Service Request (Mosaic)

For transport of biohazardous materials contact the McMaster Biosafety Office at mbso@mcmaster.ca.

Offsite transport is to be conducted by an approved hazardous waste transporter - Contact EOHSS or the FHSSO for arrangements.

Properly trained laboratory personnel may transport radioactive materials on campus only if:

- It has been documented that they have been trained in Radiation Safety.

- The radioactive materials are properly packaged and labelled.

Asbestos Containing Equipment

Care must be taken to avoid damaging or disturbing asbestos-containing materials.

Contact EOHSS/FHSSO if you suspect that you have any asbestos containing items. EOHSS will assist in the inspection of items containing asbestos.

If it is necessary to disturb asbestos-containing materials, contact Facility Services ext. 24740 before beginning work.

Packing supplies

- Appropriate spill kits are available and accessible
- Proper personal protective equipment is available, accessible, and being used.
- Packing supplies (boxes, absorbent, markers, carts, tape, bungee cords) are appropriated. Contact Facility Services to request packing totes and boxes (there may be a fee)

Preparing for packing

- Wear personal protection equipment appropriate for the materials being handled (chemical goggles, lab coat, gloves closed-toed shoes, aprons, etc.) when packing.
- Ensure containers are labelled according to WHMIS 2015
- Make sure that containers are sealed and not likely to leak in transport
- Replace containers if in poor condition. Using damaged containers is one of the major causes of accidental spills.
- Move only labelled and non-leaking containers to your new location.
- Make sure that all caps and lids are in good condition.
- Secure glass stoppers to their containers with tape or Parafilm
- Provide secondary containment for all chemicals being transported.

Packing your chemicals

- Only pack in small quantities
- Use sturdy boxes or deep trays to pack chemical containers.
- Ensure boxes are not overloaded and can be closed, sealed and stored in an upright position
- Cardboard boxes of any type are not recommended. Rubbermaid containers would be preferable (Facility Services has blue plastic totes).
- Ensure that all chemicals are segregated according to compatibility.
- Label each box as you pack. Include an inventory of chemical names. Label all boxes according to general hazard class (e.g., radioactive, flammable solid, acid, base, etc.)
- Check containers for expiration date and signs of corrosion or crystallization; if such degradation has occurred, arrange for disposal of the material through EOHSS
- Refrigerated materials need not be boxed together but should be separated into their hazard classes or handled according to their own special requirements.

The following should be given particular attention during your move:

Acid Large batteries Power supplies	**Solvents** Degreasing equipment	**Compressed Gases** Internal cylinder ampoules Canisters
Asbestos Autoclaves Ovens Furnaces Gloves Curtains Incubators	**Radioactive Materials** Gas chromatographs Liquid scintillation devices	**Mercury** Manometers Thermometers Barometers

Special Materials

- Refer to SDS for proper transportation or manufacturers guidelines for all special materials such as Designated Substances (remember to update your DSR once in the new location); fragile or perishable materials etc.

Equipment containing mercury

- Any equipment containing mercury must be disassembled and the mercury removed prior to moving equipment. If the mercury removed is waste, it must be properly labeled and disposed of.
- If removal of mercury is not possible, the equipment must be made safe for transport – Clearly label “Contains Mercury”; package so as to immobilize equipment; secondary containment; careful labeling indicating “This Way UP”; “Do Not Tip” etc.

Radioactive materials

- Radioactive materials need to be properly packaged and labelled for any move. Make arrangements with the Health Physics Office for packaging and transporting radioisotopes. No radioactive materials are to be left behind after the move.
- Be sure that your new location is included in your permit prior to your move. See previous section,” Planning Your Move” - Radioisotopes

Biological materials

- The McMaster Biosafety Office must be contacted prior to the relocation of any biological hazard materials. Biohazardous materials must be properly packaged prior to the move. Consult mbso@mcmaster.ca regarding proper preparations.

Biosafety cabinets

- Clear cabinets of all items. Decontaminate using an external contractor as per biosafety guidelines. Contact mbso@mcmaster.ca to arrange for decontamination and moving. Secure glass and power cables for transport.

Incubators

- All incubators must be emptied and decontaminated before being moved.
- Water jackets to be drained and gas tubing to be disposed.

Liquid Nitrogen Dewars and Tanks

- If contained biohazards, maintain biohazard labelling on the outside
- Where possible, it is recommended to move biohazards on dry ice and empty and decontaminate the empty dewar or tank prior to moving
- Contact Facility Services to move large dewars or tanks still containing liquid nitrogen if moving to another building

Gas cylinders

- Remove regulator and secure the valve cap before moving a cylinder.
- Transport cylinders on a four wheeled cart, after carefully securing them in an upright position.
- Contact Facility Services for assistance if moving cylinders to a different building

Back Injury Prevention

Be Careful! With your chemicals, equipment, and you!
Although you may not be moving your lab contents personally, you will be packing boxes, moving items out of the way, and stretching over and around objects. To prevent back strain:

- Do not twist while you lift, carry, or deposit a load. Twisting when reaching, lifting or depositing an object is the main cause of back injuries. Make certain that you are facing the object squarely,
- Do not lift or lower an object above shoulder height. Use a ladder or step stool to position yourself so that high objects are below shoulder height. ASK for assistance!
- Do not stretch to pick up or deposit an object. If you must stretch to reach an object in front of you, support your upper body weight by leaning on a desk or table.
- Get as close as possible to the object you are lifting to prevent back strain. Even a light object lifted at arm length can strain your neck and back, particularly if it is done repeatedly.
- Lift with your leg muscles, not with your back. As you lift, keep the load as close to the body as possible. Keep your back straight as you lift while bending at the knees.

DECOMMISSIONING THE OLD AREA

Once the old facility is vacated, the following must be done:

- Final Walk-though: Check the entire facility for containers of chemicals or other hazardous materials remaining. No hazardous materials are to be left behind in the old facility once the move has taken place. Any remaining containers must be moved to the new laboratory or disposed of.
- All work surfaces are to be decontaminated – wipe down with appropriate cleaners and sweep or vacuum floors
- All bench top (Benchkote) covering must be taken up and properly disposed of.
- Door signs are to be taken down and discarded. Radiation symbols on all signs must be defaced prior to disposal.
- Once approved by Health Physics, all radioactive materials, tape, notices, and symbols must be removed.
- Extensive surveys must be conducted by Health Physics to assure that there is no residual contamination.
- All storage areas outside the laboratory (including attics and basements) are to be checked for chemicals and property belonging to the lab. Any property found must be either moved or labelled with the name and address of the owner.
- Fill out the Laboratory Decommissioning Checklist (the signature of the lab Supervisor and Department Chair is required) and send to EOHSS – See Appendix A

ONCE THE MOVE-IN IS COMPLETE

Once you are moved into the facility, you can use this checklist to ensure the lab is safe for work.

Make a checklist out of this material

Emergency equipment

- The emergency eyewash and shower are working and accessible within lab work areas.
- Fire extinguishers are readily accessible; panic buttons have been tested
- Appropriate spills kits are available and accessible.
- There is a properly completed lab hazard door sign
- The lab emergency contact information has been registered with McMaster Security Services.

Chemical storage

- Flammables are properly stored.
- Chemicals are segregated according to hazard class.
- Corrosive materials are stored in low cabinets/shelves below waist level.
- Liquids have secondary containment.
- There is a designated area for collecting waste chemicals
- *Contact EOHSS with PI/Supervisor, old lab location and new lab location so chemical inventory can be updated (eohss@mcmaster.ca)

Biohazardous materials storage

- Biohazard storage units are properly labelled with biohazard signage and local contact information.
- Storage units are locked if in hallways or in lockable rooms which are secured when unoccupied
- Laboratory containment zones have required biohazard signage on entry doors.
- Biohazard Utilization Protocol is updated.

Radioactive materials storage

- The materials are properly stored.
- Radioactive labels are properly posted on cabinets, hoods and refrigerators where material is located.
- The laboratory is properly labelled (i.e. "RADIOACTIVE MATERIALS”) and the required notices (proper work procedures, radioisotope permit) are posted.
- Inventory list is maintained
- Contamination survey procedures and records are prepared and implemented for the new location

General laboratory conditions

- Hazardous work areas are posted with hazard and warning information? (e.g., biohazards, carcinogens, radiation, lasers, UV light).
- The fume hoods and alarms are working properly and have been certified within the past year.
- Biological safety cabinets have been recertified for proper operation.
- Compressed gas cylinders are properly secured and labelled.
- Proper disposal containers are available for materials such as sharps, needles, broken glass,
- Heavy items are stored on low shelves.
- All toxic gases are stored in a mechanically ventilated area such as a toxic gas cabinet or fume hood.

Appendix A - Laboratory Decommissioning Checklist

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Human Resources Services
McMaster University
1280 Main Street West
Gilmour Hall, Room 304
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Tel: 905.525.9140 ext.24352
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All equipment remaining in the room (refrigerators, flammable cabinets, etc) removed or tagged as hazard free		
All glassware is clean and decontaminated or removed from the lab		
Sharps and broken glassware disposed of as appropriate		
If applicable, advise Health Physics and Bio Safety Office		

Principal Investigator:

Signature: _____ Date: _____

Department Chair

Signature: _____ Date: _____