LAB MOVE QUICK REFERENCE GUIDE

INTRODUCTION

Laboratories contain a multitude of regulated hazardous materials, including chemicals, biological materials, controlled substances, lasers, and radioactive materials (RAM) and sources. Hazardous materials are highly regulated by federal, state, and local entities and moving these materials requires that we follow those regulations for packing and transportation.

Preparing your laboratory for a move will take time and effort. EHSRM has put together this Quick Reference Guide to assist you in this process.

RESPONSIBILITIES

The Principal Investigator (PI) must notify EHSRM of a pending laboratory move 6-8 weeks in advance of the scheduled move. The notification should include the scheduled move date, current and new locations, and a general description of all materials to be moved from the lab, including equipment, chemicals, biological materials, controlled substances, lasers, and/or radioactive materials or sources. EHSRM and/or the PI may need to amend federal or state permits, and schedule contractors and/or vendors depending on what is being moved. This process will take a minimum of 30 days.

In laboratories where chemical, biological, or radioactive materials have been used, the PI and assigned laboratory staff are responsible for ensuring that all laboratory surfaces and equipment have been properly disinfected or decontaminated prior to the move. The PI and lab staff are also responsible for preparing and packing all items and equipment in the laboratory in accordance with this guide.

The PI must schedule a pre-move walkthrough with EHSRM to obtain final clearance to move the lab. EHSRM will provide a door tag to the PI once decontamination of equipment and other items to be moved is complete. The signed door tag will tell the **General Move Contractor (GMC)** or **Materials Management (MM)** that all items in the lab are prepared and safe for moving.

For moves where **chemicals and/or infectious materials** must be moved to another building, EHSRM will bring in a specialty **Lab Pack Contractor (LPC)** to pack items in accordance with US Department of Transportation (DOT) requirements. For moves within the same building, the PI and properly trained lab staff may pack and move chemicals after the pre-move walkthrough and final clearance is given by EHSRM. EHSRM and the PI will determine together the best and safest way to pack and move infectious substances within the same building.

QUESTIONS?

Contact:
Environmental Health, Safety, and Risk Management
Ehs@txstate.edu
512-245-3616

BEFORE YOU MOVE:

Notifications, Permit Amendments & Scheduling (6-8 weeks prior to move)	• PI must notify EHSRM of move at least 6 weeks prior to the move. EHSRM will:
	  • Amend permits for lasers and/or radioactive materials or sources.
	  • Schedule a Lab Pack Contractor to pack and move chemicals and/or infectious materials if they will be moved between buildings.
	  • Schedule contractor to move Biosafety Cabinets.
	• PI will schedule the vendor to move gas cylinders between buildings.
	• PI must begin the process of amending DEA license for controlled substances. See **Controlled Substances** below for more information.

Prepare & Decontaminate	• Use attached **Equipment Prep & Decontamination Guide** for assistance. • Defrost freezers and refrigerator/freezer combos that will be moved. • Drain any equipment containing pump oil, water, chemicals, etc. • Decontaminate all equipment, chemical storage cabinets, glassware, and labware which has been in contact with hazardous, biological, or radioactive materials.
Items containing Mercury	• Items containing mercury (thermometers, barometers, bubblers, etc) must not be packed with other items, leave these items out for the LPC. • Large equipment with a mercury source must have the source removed and set aside for the LPC prior to the equipment being moved.
Gas Cylinders	• Gas cylinders must be moved between buildings by the cylinder vendor. • Small propane or oxygen cylinders or any lecture sized bottles should be left out for the LPC to move.
Packing Sharp Lab Supplies	• All uncontaminated lab supplies which have sharp edges or points, such as needles, syringes, scalpels, razor blades, glass slides, or glass pipettes, must be placed inside a rigid container prior to placement in a shipping crate.
Packing Biological Materials	• All biological materials must be overpacked in a secondary container with a label listing the contents before being packed in a shipping crate. One of the two containers must be puncture-resistant and leak-resistant. • The secondary container should be closeable and easy to decontaminate; absorbent material must be placed inside the secondary container. • At minimum, plants used in research should be packed in sealed plastic bags. If feasible, the sealed bags should be placed in a box or shipping container before being transported. • Material must be packed so that it will stay upright during transportation. • A universal biohazard sticker provided by EHSRM must be placed on all shipping crates or boxes which contain biological materials. • Infectious substances must be packed and transported in accordance with US DOT regulations. The PI must contact EHSRM to make arrangements for packing and transporting these items between buildings.

Preserved Specimens	• Any tissues or specimens preserved in formaldehyde, ethanol, or other chemical preservatives/fixatives must be moved between buildings by the LPC as hazardous materials. The containers must be properly sealed and labeled with the chemical name.
Refrigerators and Freezers with Biological Materials	• Biological materials in Ultra-Low Temperature Freezers (-80^{0}F) and horizontal freezers may be moved inside the freezer as long as the spaces are filled/stuffed with packing material to prevent shifting. • All other freezers and refrigerators containing biological materials must be emptied prior to move. Coolers with dry ice can be used to pack and transport refrigerated biological materials. • All freezers with buildup must be defrosted prior to the move. Follow instructions in the **Equipment Prep & Decontamination Guide**.
Controlled Substances	• Controlled substance registrations are issued by the US Drug Enforcement Agency (DEA) to individual researchers. • Permits must be updated **prior** to moving the controlled substances. Refer to the DEA website http://www.deadiversion.usdoj.gov/drugreg/index.html for permit changes. This process may take 6 – 8 weeks. • These items must be inventoried by the permit holder per DEA regulations, **moved by the permit holder**, and re-inventoried upon arrival at the new location and secured.
Broken Glass Boxes	• Discard broken glassware in broken glass boxes. Contact for EHSRM if you need broken glass boxes and liners. • Once ¾ full, tie up the bag, seal the box, label, and place in the dumpster. • Biologically contaminated broken glass must be autoclaved prior to disposal in broken glass boxes. • Broken glass that is grossly contaminated with highly toxic substances (heavy metals, cyanides, etc) must be disposed of as Hazardous Waste. Place the glassware in a sealed rigid container with a Hazardous Waste label, and place it in the SAA.
Hazardous Wastes	• Gather all hazardous waste items in the Satellite Accumulation Area (SAA) in your lab, ensure waste containers are labeled with the contents, closed, and in good condition. • Unwanted chemicals should be put into bins and placed in the SAA for disposal. If the original chemical label is no longer legible, the PI must place a secondary label on the bottle identifying the contents. A single Hazardous Waste label can be placed on the bin. • Empty chemical containers that did not contain an acutely toxic chemical may be disposed of in the trash. The PI must deface the label and write "EMPTY" on the container. • If you have a large inventory of chemicals for disposal, write an inventory of those items and submit electronically to EHSRM.

Biowaste and deactivation of biowastes	• Properly dispose of any biological waste in appropriate biowaste containers or autoclave materials and then dispose waste in regular trash. • Biowaste boxes are not to be used for general waste or for moving lab equipment. • Cultures and media may be converted to general waste through decontamination/inactivation. • Contact EHSRM to schedule a pick-up of biowaste, including unpreserved animal carcasses, prior to your move. Do not take biowaste to the new location. New waste containers will be provided.
Radioactive Materials (RAM)	• The PI must consult with the EHSRM Laser and Radiation Officer prior to packing radioactive materials to schedule a wipe test and inventory. • Only the Laser and Radiation Officer is authorized to move RAM. • Potentially radioactive materials include lead pigs, Plexiglas or other shielding, and equipment that held radioactive materials.
Pack Non-Hazardous Materials	• Pack all non-hazardous materials (ie. – anything that is not a chemical, biological material, or radioactive material) into crates or boxes. Do not pack hazardous materials with non-hazardous materials.
Prepare Chemicals for Packing and Moving	• Chemicals must be labeled with the chemical name. • Solutions (buffers, dilutions), and any chemicals in secondary containers must be labeled with the chemical name or abbreviation. If your abbreviation is not on the attached **Chemical Abbreviation List**, contact EHSRM. • Remove chemicals from refrigerators so they can acclimate. If a chemical must remain cold, use a cooler prepared with a compatible medium to keep item(s) cold and prevent shifting. • Make sure all containers of chemicals and solutions to be moved have lids and are securely closed and in good condition. • If a chemical container is not in good condition, dispose of it through EHSRM or place it in a secondary container that can be closed and label the outside of the secondary container. • Segregate chemicals according to the attached **Chemical Segregation Chart**. • If chemicals are being moved to another building, a Lab Pack Contractor will be scheduled to pack and move your inventory. You may leave already segregated and labeled chemicals in cabinets as long as the chemicals are visible to the LPC. Otherwise, pull the chemicals out and segregate them on the countertop. • If you are moving within the same building, pack chemicals according to the Chemical Segregation Chart into hard plastic bins, using compatible packing material if needed to prevent shifting. Use bottle carriers for large glass containers. Packed bins and bottle carriers may be placed neatly on a cart in a single layer (no stacking) and moved by the PI or designated trained staff. • Set aside unwanted chemicals for disposal through EHSRM. • **Chemicals should not be thrown away or dumped down drains.**

Obtain Clearance to Move and Schedule LPC	• Contact EHSRM at 512-245-3616 to request a pre-move walk-through. • EHSRM will inspect the lab to ensure all the above steps have been completed and provide the PI with a signed door tag providing clearance to move the items in the lab. • If you are moving to another building, EHSRM will schedule the LPC. • EHSRM will schedule a pick up of all hazardous wastes and biohazard waste. • Download and begin filling out the Lab Closure Form found under Chemical Safety on the EHSRM website. Once all items are moved from your lab and you have completed the actions on the Lab Closure Form, contact EHSRM to schedule the final lab close-out.

AFTER YOU MOVE:

Safety Check	• Ensure your equipment and engineering controls are working properly. • Check Fume Hoods for flow. • Test your eye wash for water flow.
Unpack chemicals	• Unpack chemicals and store them according to the **attached Chemical Segregation Chart**. • Drums used for chemical packing must be unpacked within 2 weeks so that the drums can be returned to the contractor. • Contact EHSRM to pick up empty drums.
Controlled Substances	• Re-inventory controlled substances upon un-packing and maintain the updated paperwork for your amended registration.
Register Your New Space & Transfer/Update Chemical Inventory	• Log in to EHS Assistant to register your new lab space with EHSRM and transfer/update your chemical inventory. • EHSRM will schedule a walk-through of the lab with you once the registration has been submitted. • EHSRM will set up your Satellite Accumulation Area for hazardous waste and provide new containers. Biowaste boxes and sharps containers will also be provided if needed. Coordinate with EHSRM prior to the walk-through on the number and type of waste containers that are needed.
Complete your Lab Closure tasks for your old space	• You must complete all applicable remaining tasks (housekeeping, etc) on the Lab Closure Form within 30 days of vacating the old laboratory space, or sooner if directed by your Chair/Dean. • Remove trash, check drawers, cabinets, etc. Wipe down and decontaminate all surfaces, including fume hoods. • Remove any signs, stickers, or procedures that are specific to your laboratory from walls, doors, cabinets, fume hoods, etc. • Contact EHSRM when tasks have been completed to schedule a final walk-through. You must provide the completed Lab Closure Form to the EHSRM Specialist during the walk-though.

EQUIPMENT PREP & DECONTAMINATION GUIDELINES

Principal Investigators and laboratory staff must properly decontaminate their laboratory equipment of hazardous materials (chemical, radioactive, or infectious materials) before the General Move Contractor (GMC) or Materials Management (MM) personnel can transport the equipment.

For most chemicals, scrubbing with a laboratory detergent (Alconox or equivalent) and water should be adequate to remove the chemical contamination. Place contaminated wipes in a heavy duty or ziplock bag and label it with a Hazardous Waste label indicating the contents/contamination.

To remove infectious residues use the following chemical disinfectants as appropriate:

- Sodium hypochlorite (bleach at 5.25%), (Mercury Free), 1:10 dilution
  - NOTE: Bleach is corrosive. To disinfect metal surfaces, allow 20 minutes of contact time following by rinsing.
- Wescodyne (NSN-6840-00-526-1129),
- Hydrogen Peroxide
- Place biologically contaminated wipes in a biowaste box.

Here are some common examples of lab equipment that may need to be drained and/or decontaminated:

- Combination Refrigerators/Freezers – Remove all contents such as mercury thermometers, chemicals, reagents, and radioactive isotopes. Decontaminate the refrigerator if it held radioactive isotopes, infectious agents, or toxic chemicals. Defrost the unit if there is a buildup of ice around the freezer compartment. If ice melt is contaminated, collect the liquid in a waste container and/or use absorbent pads to capture the ice melt. All contaminated waste must be disposed of through the appropriate waste disposal program (Hazardous Waste or Biowaste).

- Freezers – Remove all mercury thermometers, hazardous chemicals, and radioactive isotopes. Decontaminate the freezer if it held radioactive isotopes, infectious agents or toxic chemicals. Frozen tissues and specimens may remain inside freezer while being shipped by the moving contractors. If the freezer needs to be defrosted prior to the move, remove all items, defrost, and re-pack. If ice melt is contaminated, collect the liquid in a waste container and/or use absorbent pads to capture the ice melt. All contaminated waste must be disposed of through the approporiate waste disposal program (Hazardous Waste or Biowaste).

- Ovens – Remove all mercury thermometers or containers holding samples or liquids.

- Incubators – Remove any remaining samples and thermometers and drain the water from the jacket. Incubators which were used for infectious agents, radioactive isotopes, or hazardous chemicals must be properly decontaminated prior to the move.

- Centrifuges – Inspect for centrifuge tubes holding water or samples to ensure they have been removed from the rotor system. Centrifuges which were used with infectious agents, radioactive isotopes, or hazardous chemicals must be properly decontaminated prior to the move.

- Water baths – Drain water from the unit and remove any remaining samples or mercury thermometers.

- Balances or scales – Wipe clean to remove any remaining chemical contamination inside the balance or on the scale.

- Chemical storage cabinets such as flammable or corrosive cabinets must have all the chemical containers removed prior to moving the cabinet. Decontaminate the chemical storage cabinetof any remaining spills or residues.

- Vacuum pumps contain vacuum pump oil. Vacuum oil which is grossly-contaminated with toxic chemicals or other hazardous materials should be removed prior to shipment. Discard all spent vacuum pump oil through EHSRM as hazardous waste.

- Mercury thermometers – Set aside all mercury thermometers for shipment by the Lab Pack Contractor.

- Heating blocks need to have samples and mercury thermometers removed. If necessary, decontaminate the heating block. Set all mercury thermometers aside for shipment by the Lab Pack Contractor.

- Photo-processing equipment usually contains three storage tanks holding caustic developer, acidic photographic fixer and rinse water. Drain the storage tanks, supply hoses and drain hoses into an appropriate waste container prior to the move. Discard the photo-processing chemicals through EHSRM as hazardous waste.

- Gas chromatographs (GC) which have electron capture detectors contain a radioactive source. If your GC has a radioactive source, contact EHSRM at 512-245-3616 prior to moving the unit.

- High Performance Liquid Chromatography (HPLC) may have columns that contain solvents. Drain the columns and waste lines prior to moving the HPLC. Dispose of the solvent wastes through EHSRM as hazardous waste.

- Tissue dehydrating units – Remove or drain all solvents from the storage tanks. Dispose of the solvents through EHSRM as hazardous waste. Paraffin wax and tissue samples may also need to be removed from the unit.

- Colorimeters may contain cuvets holding liquids. If this is the case, the cuvets need to be removed from the colorimeters before shipping.

- Spectrophotometers may have automatic sample feeders holding sample containers or standards. If this is the case, remove the containers or standards before shipping.

- Desiccators may contain drying agents (Drierite, sodium hydroxide, phosphorus pentoxide). Assure they are removed and placed in a sealed container for transport by the LPC. Discard spent drying agents through EHSRM as hazardous waste.

- Water purification systems – Remove all the free-standing water from the cartridges prior to the move.

- Liquid Scintillation Counters (LSCs) likely have a radioactive source inside and need to be prepared for the move by the vendor or a specialized contractor. Contact EHSRM at 512-245-3616 to coordinate the move of these units.

- Biosafety Cabinets – must be decontaminated, moved, and recertified by a contractor who is certified to do so. Contact EHSRM at 512-245-3616 to coordinate the move of these units.

General Chemical Segregation

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are incompatible. Classes of incompatible chemicals should be segregated from each other when in storage. Use the following general guidelines.

HAZARD CLASS	RECOMMENDED STORAGE METHOD	EXAMPLES	INCOMPATIBILITIES CHECK SDS/MSDS
Oxidizers	Store inside a noncombustible cabinet, separate from flammable and combustible materials. Store inorganic oxidizers, organic peroxides, separate from each other via secondary containment.	Inorganic oxidizers - Sodium hypochlorite, ammonium nitrate Organic peroxides – methyl ethyl ketone peroxide, allyl compounds, haloalkenes, dienes, monomeric vinyl compounds,	Separate from reducing agents, flammables and combustibles
Flammable Liquids	Store in grounded flammable storage cabinet.	Acetone, benzene, methanol, ethanol, toluene	Separate from acids, bases, oxidizers, and poisons.
Flammable Solids	Store in grounded flammable storage cabinet. Flammable solids must be segregated from flammable liquids using secondary containment.	Phosphorus, lithium, sodium, potassium	Separate from acids and oxidizers.
Corrosives Acids	Store in separate acid storage cabinet. Within the acid cabinet store each of the following groups separately via secondary containment: oxidizing acids, flammable (organic) acids, and mineral acids.	Oxidizing acids - nitric acid, perchloric acid, chromic acid, picric acid Flammable and organic acids – glacial acetic acid, trifloroacetic acid, trichloroacetic acid Mineral acids - Hydrochloric acid, sulfuric acid, phosphoric acid	Separate from flammable liquids, flammable solids, bases, oxidizers.

General Chemical Segregation

CLASS OF CHEMICALS	RECOMMENDED STORAGE METHOD	EXAMPLES	INCOMPATIBILITIES CHECK SDS/MSDS
Corrosives - Bases	Store in separate storage cabinet. Store inorganic bases separate from reducing agents via secondary containment.	Inorganic bases – sodium hydroxide, potassium hydroxide, ammonium hydroxide Reducing agents – Lithium aluminum hydride, sodium borohydride, lithium borohydride	Separate from oxidizers and acids.
General Chemicals Non-reactive	Store on general laboratory benches or shelving preferably below eye level.	Agar, sodium chloride, sodium bicarbonate, and most non-reactive salts	See SDS/MSDS
Water Reactive Chemicals	Store in dry, cool, location, protect from water fire sprinkler. Note: Many water reactive chemicals are flammable solids. If flammable solid, store as such. If not, store separately from all other chemicals.	Sodium metal, potassium metal, lithium metal, lithium aluminum hydride	Separate from all aqueous solutions, and oxidizers.
Poisons (Toxicological Hazard)	If poisons can be categorized as oxidizer, acid, or flammable, store as such. If non-reactive but highly toxic store separately from all other chemicals.	Cyanides, heavy metals compounds (e.g., cadmium, mercury, osmium) methyl iodide, dimethyl sulfate, mercury	Flammable liquids, acids, bases, and oxidizers.

Chemical Abbreviations List

Abbreviation	Product Full Name	CAS No.	Hazard (HMIS)
			* Carcinogen
ABTS	2,2'-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt	30931-67-0	1,0,0
ACN	Acetonitrile	75-05-8	2,3,0
BSA	Bovine serum albumin	9048-46-8	1,0,0
CAPS	3-(Cyclohexylamino)-1-propanesulfonic acid	1135-40-6	2,0,0
DAPI	4',6-Diamidino-2-phenylindole	28718-90-3	1,0,0
DCM	Dichloromethane	75-09-2	*2,0,0
DEAE	N,N-Diethylethanolamine	100-37-8	3,2,0
DEPC	Diethyl pyrocarbonate	1609-47-8	2,1,0
DMEM	Dulbecco's Mofidied Eagle medium	OSUP0496	0,0,0
DMF	N,N-Dimethylformamide	68-12-2	3,2,0
DMSO	Dimethyl sulfoxide	67-68-5	1,1,0
DTE	1,4-Dithioerythritol	6892-68-8	1,0,0
DTT	Dithiothreitol	3483-12-3	2,0,0
EDTA	Ethylenediaminetetraacetic acid	60-00-4	1,0,0
EGTA	Ethylene glycol bis(2-aminoethyl ether)-N,N,N'N'-tetraacetic acid	67-42-5	0,0,0
EtBr	Ethidium bromide	1239-45-8	4,0,0
EtOH	Ethanol	64-17-5	0,3,0
H_2O	Water (MQ = milli-Q, DI = distilled)	7732-18-5	0,0,0
H_2SO_4	Sulfuric acid	7664-93-9	2,0,0
H_3PO_4	Phosphoric acid	7664-38-2	2,0,0
HCl	Hydrochloric acid	7647-01-0	2,0,0
HEPES	N-2-Hydroxyethylpiperazine-N-2-ethansulfonic acid	7365-45-9	1,0,0
HNO_3	Nitric acid	7697-37-2	2,0,2
HOAc or HAc	Acetic acid	64-19-7	2,2,0
IPTG	Isopropyl β-D-1-thiogalactopyranoside	367-93-1	0,0,0
KOH	Potassium hydroxide	1310-58-3	2,0,0
MeOH	Methanol	67-56-1	3,3,0
MES	2-(N-morpholino)ethanesulfonic acid	4432-31-9	1,1,0
MOPS	3-(N-Morpholino)propanesulfonic acid	1132-61-2	1,0,0
NaOAc	Sodium acetate	127-09-3	1,0,0
NaOH	Sodium hydroxide	1310-73-2	2,0,0
PBS	Phosphate buffered saline	OSUP0496	0,0,0
PEG	Polyethylene glycol	25322-68-3	0,0,0
PIPES	Piperazine-N,N'-bis-2-ethanesulfonic acid	5625-37-6	0,0,0
PMSF	Phenylmethanesulfonyl fluoride	329-98-6	3,0,2
SDS	Sodium dodecyl sulfate	151-21-3	2,1,0
TAE	TRIS-Acetate-EDTA buffer	OSUB0095	0,0,0
TB	Terrific broth	OSUL0004A	0,0,0

Abbreviation	Product Full Name	CAS No.	Hazard (HMIS)
TBE	TRIS-Borate-EDTA buffer	OSUB0095	0,0,0
TBS	TRIS buffered saline	OSUB0095	0,0,0
TCA	Trichloroacetic acid	76-03-9	2,0,0
TE	Tris-EDTA buffer	OSUB0095	0,0,0
TEMED	N,N,N′,N′-Tetramethylethylenediamine	110-18-9	3,3,0
TES	N-tris(hydroxymethyl)methyl-2-aminoethane sulfonic acid	7365-44-8	0,0,0
TFA	Trifluoroacetic acid	76-05-1	2,0,0
THF	Tetrahydrofuran	109-99-9	1,3,1
TRIS	Tris-(hydroxymethyl) aminomethane	77-86-1	1,0,0
TWEEN	Polyethylene glycol sorbitan monolaurate	9005-64-5	0,0,0