	Y	N	NA	COMMENTS
Building and Room:	Date:			
Date:	PI:			
Audit Performed by::				
A. General Work Environment				
1. Work areas illuminated				
2. Storage of combustible materials minimized				
3. Trash removed promptly by responsible party				
4. Aisles kept clear				
5. Frequently wetted surfaces covered with non-slip material				
6. Heavy items stored on lower shelves				
7. Equipment available to reach items above shoulder level				
8 Storage at least 18 inches below sprinkler head				
9. Storage at least 24 inches below ceiling (no sprinkler)				
10. Exits				
a. Illuminated signs present and working				
b. Paths free from obstruction				
c. Alternate exits available				
d. Fire doors not blocked or wedged open				
e. Doors not locked (in direction of exit)				
11. Security/controls where required for certain materials				
12. Pits and floor openings covered or guarded				
B. Emergency Planning				
1. Building fire extinguishers unobstructed				
2. Building fire extinguishers fully charged; tamper indicator in place				
3. Eyewash and safety showers available in close proximity and unobstructed				
4. Fire alarm pull stations unobstructed				
5. Emergency lights functional (where present)				
6. Self-contained breathing apparatus inspected				
7. Eyewash and safety shower inspected regularly				
8. Spill control plan completed				
9. Spill control materials available and adequate to cover potential spills				
C. Required Information/Postings				
1. Written Emergency Action Plan				
2. Material Safety Data Sheets readily accessible				
3. Written Chemical Hygiene Plan available in lab				
4. Written Respiratory Protection Program (EH&S document)				
5. Documentation of PPE Hazard Assessment/ training				
6. OSU Emergency Information sign current				
7. OSHA poster				
8. Telephones posted with emergency stickers				
9. Building Evacuation routes posted				

A. General Work Environment

1. Depending upon the tasks involved, adequate lighting should be provided.
2. Minimize storage of materials that would add fuel to a fire. Examples: paper goods, plastic containers, materials stored in boxes, empty containers.
3. Self explanatory
4. Self explanatory
5. Self explanatory
6. Self explanatory
7. A warehouse ladder, step stool, or some other appropriate means should be provide where items are stored above shoulder level.
8. Uniform Fire Code: storage must be at least 18 inches below sprinkler heads.
9. Uniform Fire Code: in area with no sprinkler system, storage must be at least 24 inches below the ceiling.
10. Items (a) through (d) - Self explanatory.

    Item (e) - Exit doors, including those which open directly from lab spaces into stairwells, must not be locked during normal business hours. Security measures are allowed after hours, with the approval of the local fire official.
11. Certain materials, such as controlled substances, require special security systems or controls to limit access.
12. Any floor opening or pit deeper than 4 feet must be covered or guarded to prevent falls.

B. Emergency Planning

1. Self explanatory
2. Fire extinguishers are inspected annually by EH&S and results recorded on an attached inspection card. Some types of fire extinguishers have pressure gauges. Check these to insure extinguisher is fully charged. Fire extinguishers without pressure gauges can only be checked by trained personnel in EH&S. If fire extinguisher tamper indicator is not in place, contact EH&S.
3. Close proximity is within ten seconds travel; can one find it with eyes shut?
4. Self explanatory
5. Press the self-test button on unit's power supply.
6. SCBA must be inspected at least monthly. Inspection checklists are available through EH&S.
7. Safety showers should be inspected and tested at least yearly (by EH&S) and the result recorded on an attached inspection card. Eyewashes should be inspected at least weekly by lab personnel and recorded on a log in the lab.
8. Pre-planning is essential to handling a chemical spill. A written Spill Control Plan should be available for each laboratory, considering the amounts and types of chemicals used or stored in the lab. General procedures and a guide to developing Spill Control Plans are available in the departmental Chemical Hygiene Plan and through EH&S.
9. Laboratory workers should have access to control materials for small spills appropriate to the type and amount of chemicals used or stored in the lab. EH&S maintains a chemical spill response team. Spill control materials are listed on the EH&S web page (http://oregonstate.edu/dept/EHS).

C. Required Information/Postings

1. Every department must have an Emergency Action Plan which details emergency reporting procedures, escape routes, and employee assembly and accountability procedures. A model program is available through EH&S.
2. Material Safety Data Sheets (MSDSs) received with chemical shipments must be retained by each laboratory. The departmental CHP describes location and procedures for MSDSs. The EH&S web page has pointers to several sources of MSDSs (http:/oregonstate.edu/dept/EHS). MSDSs are also available from EH&S.
3. Each department must prepare and maintain a Chemical Hygiene Plan (CHP), which includes information about hazard communication, exposure determination, medical consultation and exams, training and information, safe work practices and procedures, provisions for working with particularly hazardous substances, exposure controls and personal protective equipment, fume hoods and ventilation, emergency procedures, waste disposal, and facility specific systems and response plans. A copy of the CHP must be available to each laboratory at all times. The University CHP is maintained by EH&S.
4. If respirators, including self-contained breathing apparatus, are used, the department must follow the written OSU Respiratory Protection Program. This program is administered by EH&S
5. Departments must complete a hazard assessment to determine which types of Personal Protective Equipment (PPE; e.g. eye and face protection, gloves, etc.) should be used. Workers must receive adequate training on personal protective equipment selection and use. Documentation of the hazard assessment and training must be maintained. Sample forms are available through EH&S.
6. Laboratory emergency contacts and specific laboratory hazards must be posted at the principal entrance to each laboratory, for use by emergency response personnel
7. Commonly known as "the OSHA poster", a poster entitled *Job Safety & Health Protection* must be conspicuously placed where notices to employees are customarily posted. Copies are available through EH&S.
8. Self explanatory; available through Security Services.
9. Posting of evacuation routes is recommended as part of the Emergency Action Plan.

	Y	N	NA	COMMENTS
10. Ice makers posted "***Not for Human Consumption"***				
D. Personal Protective Equipment (PPE)				
1. Eye and face protection available where needed				
a. Goggles and face shields for corrosives				
b. Industrial safety glasses for projectiles				
2. Areas requiring the use of eye protection posted				
3. Open toe shoes prohibited in chemical use areas				
4. Respirator use:				
a. Appropriate respirator/appropriate cartridge used				
b. User enrolled in respiratory protection program				
E. Electrical Hazards				
1. Flexible cords in good condition				
2. Cover plates in place for outlets and switches				
3. Circuit breaker panels unobstructed				
4. Machine/instrument access panels in place				
5. No exposed electrical conductors (≥50 volts)				
6. Multiplug adapters (power strips) have overload protection				
7. No extension cords used for permanent (>30 day) use				
8. GFI devices used for wet/exterior use				
9. Guards/covers used for high voltage devices				
F. Chemical Storage				
1. Shelving adequate for loads imposed				
2. Chemical refrigeration units labeled ***No Food*** and ***Do Not Surplus***				
3. Refrigeration units for food labeled ***Food Only***				
4. Chemical storage cabinets properly labeled				
5. Ventilated gas cabinet used for highly toxic gases				
6. Containers clearly labeled with chemical name(s)				
7. Volatile chemical not stored in unventilated temperature control chambers				
8. Containers kept closed except during transfers				
9. Storage strictly limited in actively used fume hoods				
10. Containers compatible with the chemical				
11. Chemicals segregated to avoid incompatibilities				
12. Large/heavy containers stored on lower shelves				
13. Corrosives not stored above eye level				
14. Storage quantities minimized				
15. Secondary containers used during transport of more than one pint of hazardous chemicals				
16. Materials with shelf life dated and disposed of per supplier's recommendations				
G. Flammable Liquids				
1. Used in fume hood or well-ventilated area				
2. Stored in flammable liquid storage cabinet for more than **ten** gallons per room				

10. Ice from machines intended to provide ice for experimental purposes are not to be used for consumption because of the potential of such ice to be chemically or biologically contaminated. Signs should be posted at the machine to indicate such special use.

D. Personal Protective Equipment

1. Refer to the department's Personal Protective Equipment Hazard Assessment to determine what type of eye protection should be used.
2. Where eye protection is necessary, *Eye Protection Required* signs should be posted at the entrance to the area.
3. Self explanatory.
4. There are several types of respirators and respirator cartridges and filters. The proper combination of respirator type and cartridge or filter is necessary for protection from the anticipated concentration of the hazardous material. University policy indicates that all respirator use on campus must be reviewed by an Industrial Hygienist from EH&S and that all respirator users are enrolled in the Respiratory Protection Program (which includes annual training, fit-testing, and medical surveillance).

E. Electrical Hazards

1. Electrical cords that have frayed wires or broken insulation present significant electrical shock and fire hazards. Replace or repair any electrical cord found to be in poor condition.
2. Cover plates must be installed on all electrical outlets and switches to prevent accidental contact with electrical wires.
3. Uniform Fire Code (UFC) requires clearance of at least 30 inches for circuit breaker panels.
4. Self explanatory.
5. Self explanatory.
6. UFC prohibits the use of un-fused multi-plug adapters (e.g. cube adapters and un-fused plug strips).
7. Extension cords may not be used in place of permanent wiring. Additional electrical outlets should be installed to service equipment needs. Fused plug strips may be used
8. Self explanatory
9. Guards or covers should be used for electrophoresis devices operating at 50 volts or more. Most new devices come equipped with covers. Older devices, which may lack covers, can be guarded with shields constructed of Plexiglas or some other suitable material.

F. Chemical Storage

1. Generally, light-duty shelving should not be used. Shelving units should be securely anchored to the wall.
2. To avoid contamination, food should not be stored in refrigerators or freezers used for chemical storage.
3. To avoid potential contamination, chemicals should not be stored in refrigerators designated for food storage.
4. Labeling cabinets by chemical class (e.g. flammable liquids, acids, oxidizers) is essential if chemical storage is to be segregated to avoid incompatibilities, and to identify storage areas for emergency response personnel.
5. Highly toxic gases--fluorine, phosgene, and many semi-conductor gases--should be stored in ventilated cabinets made for this purpose. In the event of a leak or fire, the gas cabinet would contain and exhaust the gas, protecting the laboratory worker from exposure.
6. Chemical containers should be clearly labeled with at least a chemical name. The manufacturer's label is best, as it usually contains a great deal of information about health and physical hazards. When a chemical is transferred from the original container, the new container should be labeled, as possible. Small containers may use other means of identification, such as a code or number system referenced to the user's lab notebook.
7. Toxic or flammable substances that are capable of becoming airborne (e.g. gases, vapors, dusts, fumes or mists) should not be used in unventilated areas. Without adequate ventilation, air contaminants can build up to levels that pose health or flammability hazards.
8. In order to avoid spillage or release of vapors, containers should be closed except when transferring.
9. For optimum performance and containment, a fume hood should have a minimum amount of chemicals or apparatus in it when in use. Keep slots or baffles at the back of the hood unobstructed.
10. Chemicals may degrade certain container materials. For example, hydrofluoric is incompatible with glass. Inorganic hydroxides are best stored in polyethylene containers. Some organic solvents will soften plastic.
11. Self-explanatory.
12. Self-explanatory.
13. Corrosive materials can cause severe tissue damage and are particularly injurious to the eye. Storage of corrosive below eye level helps to minimize this risk.
14. Quantities of chemicals in storage should be consistent with the short- term needs of the lab. Excessive storage should be avoided.
15. When transporting chemicals between rooms or buildings, secondary containers, such as bottle carriers, should be used. In the event the container is dropped, bumped or otherwise breaks, the contents would be contained in the bottle carrier, avoiding a spill. Bottle carriers are available in many stockrooms.
16. Some chemicals (e.g. ethers) have recommended storage time limits. Chemicals stored beyond their limit date may form explosive peroxides. Upon arrival, these containers should be marked with the date placed in storage and an expiration date based on manufacturer's recommendations. Many manufacturers include an expiration date on the product label.
17. To avoid difficult and potentially costly waste disposal problems, a procedure should be in place to assure all materials are labeled and unneeded chemicals disposed of properly.

G. Flammable Liquids

1. Self explanatory.

	Y	N	NA	COMMENTS
3. Refrigeration units approved for flammables storage				
4. Flammables separated from strong oxidizers				
5.Class ABC or BC fire extinguisher available				
6. Flammable liquids not stored near hot plates or other ignition sources				
H. Compressed Gases				
1. Used in well ventilated area				
2.Toxic/flammable/corrosive gases used only in fume hood				
3. Storage quantities minimized				
4. Secured from tipping while in use				
5. Regulators compatible with gas cylinder				
6. Cylinder carts used for transport				
7. Protective valve caps in place				
8. Empty/unused gas cylinders promptly returned to supplier				
I. Cryogenics				
1. PPE used to avoid skin contact				
2. Used/dispensed with good ventilation				
3. Containers vented or pressure relief devices provided				
4. Low temperature embrittlement considered				
5. Glass dewars shielded				
J. Waste Disposal				
1. Containers kept sealed except during transfer				
2. Containers labeled with the words *Used* or *Hazardous Waste*				
3. Constituents of waste described on the container label				
4. Glass chemical containers recycled properly				
5. Separate disposal containers available for broken glass				
6. Containers compatible with waste				
K. Ventilation				
1. Each chemical fume hood has been surveyed				
2. Fume hood vents (baffles) unobstructed				
3. Fume hoods used with sash in appropriate position				
4. Chemical storage strictly limited in actively used hoods				
5. Other local exhaust devices (e.g. gas cabinets, elephant trunks) surveyed				
6. Laminar Flow cabinets posted with use limitation				
L. Pressure/Vacuum Systems				
1. System components properly designed				
2. Pressure relief devices provided and inspected				
3. Corrosion prevention considered				
4. Written operating procedures available				
5. Inspection/Maintenance procedure in place				
6. Failure analysis and hazard control documented				
7. Glass vessels shielded/enclosed				

2. If the total quantity of all flammable liquids stored in the room exceeds 10 gallons, a flammables storage cabinet must be used. No more than three flammables storage cabinets may be used in one room.
3. Normal household refrigerators must not be used for flammable liquid storage. A *flammable materials refrigerator* should be used instead. *Explosion-proof* refrigerators can also be used.
4. Chemical storage should be segregated to avoid incompatibilities. The storage of flammable liquids with strong oxidizers creates a fire hazard and should be avoided.
5. Designation that includes "B" class is appropriate for flammable liquids.
6. While true for all container types, this can be especially hazardous when plastic squeeze bottles of flammable liquids are used in hoods where hot plates are also in use.

H. Compressed Gases

1. Self explanatory
2. This does not refer to the cylinder themselves. Rather, the delivery point of the gas should be inside a fume hood.
3. As with the storage of all chemicals, quantities of compressed gas cylinders on-hand should be consistent with the short-term needs of the lab.
4. Compressed gas cylinders must be safely secured in an upright position while in storage or use. Information on the various ways to secure cylinders is available from EH&S.
5. Regulators are designed for use with specific gases, within prescribed pressure ranges. Cylinder valve outlets and inlet connectors on regulators are designed to minimize the chances of using the wrong regulator. If the connections do not readily fit together, the wrong regulator is being used.
6. Large compressed gas cylinders are heavy and difficult to move. A cylinder cart makes the job of transporting cylinders easier and more secure.
7. Cylinders without attached regulators should have valve caps in place.
8. Disposal of abandoned cylinders is difficult and costly.

I. Cryogenics

1. Loose-fitting, dry gloves, eye and face protection, lab coats and, in some cases, lab aprons may be necessary when using or dispensing cryogenic liquids.
2. Cryogenic liquids produce large volumes of gas when vaporized, which can easily displace breathable air in an enclosed or confined space.
3. Because of the large volumes of gas produced during vaporization, containers for cryogenic liquids should be vented or closed containers should be protected by pressure-relief devices to avoid over-pressurization. Pressure-relief devices must incorporate both a pressure-relief valve and a frangible disc.
4. Objects that are soft and pliable at room temperature can become hard and brittle at low temperatures and will break easily. Consideration should be given to this whenever materials are used with cryogenic liquids.
5. Shielding protects workers from implosion hazard.

J. Waste Disposal

1. Except during transfers, Dept. of Environmental Quality regulations require that all waste containers be sealed.
2. Self-explanatory - per DEQ standards.
3. Containers must list contents and approximate percentage composition. Standard chemical nomenclature (common or IUPAC) should be used. Symbols or structural formulas should be avoided.
4. To promote recycling and to reduce waste disposal costs, a procedure for disposing of empty glass chemical containers has been established. Details are available from the EH&S Web Page.
5. Broken laboratory glassware should be disposed of as *Medical Waste* or placed in a cardboard *Glass Waste* receptacle. It should not be recycled or disposed of as lab trash.
6. Chemical containers should be constructed of materials that will not be affected by the substances that are stored in them. Hydrofluoric acid will etch glass. Acids corrode many metals and some organics will soften plastics.

K. Ventilation

1. EH&S surveys and grades each chemical fume hood every year. Results of the most recent survey are posted on the hood face.
2. Exhaust slots at the rear of the working surface blocked by containers and equipment can adversely affect airflow and compromise containment.
3. When not in active use, hood sashes should be lowered. During chemical manipulations, sashes should be set at or below the position indicated on the Standard Operating Configuration sticker posted on the hood face. See Section 9 of the Chemical Hygiene Plan for more information.
4. Materials should not be stored in a hood that is in active use. The hood is perhaps the most likely site in a lab for a chemical incident to occur. Stored materials can increase the potential for a more serious incident.
5. Gas cabinets, elephant trunks or other local exhaust ventilation used to control airborne contaminants should be checked for proper operation.
6. Volatile organics or hazardous gases should not be used in laminar flow cabinets that are not connected to the building exhaust ventilation system.

L. Vacuum Pressure Systems

1. Documentation of system design should be readily available.
2. Self-explanatory. Consider consequences of pressure-relief discharge points.
3. Internal corrosion is a common cause of failure.
4. Self-explanatory.

	Y	N	NA	COMMENTS
8. Operators trained/authorized				
M. Security				
1. Doors to the lab operate, close and lock properly.				
2. Windows operate, close and lock properly.				
3. Alarm systems are operating properly if present.				
4. Keys and/or access cards are kept in a secure area, out of sight.				
N. Training/Awareness				
Training				
1. Workers have attended Laboratory Safety Training				
2. Workers have attended a laboratory orientation				
3. Workers have had training beyond EH&S training				
4. Training (EH&S and departmental) is documented				
5. Lab check-out procedures for departing lab workers				
Awareness: Do laboratory workers know				
6. How to clean up chemical spills & contact OSU spill team				
7. Location/contents of the Chemical Hygiene Plan				
8. Departmental Chemical Hygiene Officer & Safety Manager				
9. What MSDS is; where to find them and other safety information				
10. Type of PPE to use and when to use it				
11. What to do with chemical waste				
12. What are most hazardous materials used; precautions to take				
13. What materials used in the lab are biohazards, carcinogens, highly toxic agents or reproductive toxins. Have appropriate forms been completed?				

5. Self-explanatory.
6. Documentation of all failure modes with corresponding controls should be prepared and available.
7. Self-explanatory.
8. Self-explanatory.

M. Security

1. Self-explanatory. Report problems to the Maintenance Supervisor.
2. Self-explanatory. Report problems to the Maintenance Supervisor.
3. If possible, conduct a test of any alarm systems.
4. Keys and access cards should be kept out of sight to help prevent theft. Report lost keys or access cards to the Department Manager immediately.

N. Training/Awareness

1. All laboratory workers (including faculty, staff, graduate students, and undergraduates who work independently) must attend EH&S Laboratory Safety Training.
2. All laboratory workers should receive an orientation to the laboratory, which includes, at least, where the Chemical Hygiene Plan (CHP) is kept, how to use laboratory equipment, how and when to use personal protective equipment, where emergency equipment, such as eye washes and safety showers are, who to contact in an emergency, where MSDSs are kept, spill control procedures, emergency procedures and incident reporting.
3. The EH&S Laboratory Safety Training is general in nature and does not cover specific chemicals or experimental procedures. Additional training must be provided by departmental personnel. A summary of this additional training may be found in the CHP.
4. All training, including departmental training and that given by EH&S, must be documented. Such records must be kept at least until the laboratory worker leaves OSU.
5. To avoid difficult and potentially costly waste disposal problems, a procedure should be in place to assure all materials are labeled and unneeded chemicals disposed of properly.

Awareness Questions

These questions may be asked of a representative number of laboratory workers to assess the level of understanding of health and safety issues. Based on answers to these questions, additional training may be warranted. EH&S may assist the department in developing such training.

6. Lab workers should know where spill control materials are stored and how to use them. Basic information about cleaning up chemical spills is covered in Laboratory Standard training. EH&S offers a more extensive training program for departments or groups upon request.
7. A cursory overview of the contents of the model Chemical Hygiene Plan is offered during Laboratory Standard training. More specific information must be given by the department.
8. A list of Chemical Hygiene Officers for the various departments is reviewed during Laboratory Standard training, and should be confirmed by the department. In most departments, the Department Manager is also the Departmental Safety Manager.
9. An overview of the type of information available in MSDSs is given during Laboratory Standard training. Departments must explain where to find MSDSs and the protocol for obtaining and maintaining MSDSs within the department.
10. General information about the use of personal protective equipment is discussed in Laboratory Standard Training. Specific information about what particular PPE must be used for specific chemicals or processes must be given by the department.
11. Chemical waste procedures are reviewed in Laboratory Standard training. Specific departmental or laboratory procedures must be explained by the department.
12. Many particularly hazardous materials require special handling, decontamination, disposal, or other precautions. Laboratory workers should have a thorough understanding of the hazards and should follow standard operating procedures which incorporate these safety measures.
13. Carcinogens, highly toxic agents, and reproductive toxins are considered particularly hazardous substances. A prior approval process should be in place within the department. This process may include completing a form and receiving special permission from the Principal Investigator and/or Chemical Hygiene Officer. See the CHP for more information.