

RSU #34 Chemical Hygiene Plan

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POLICY STATEMENT

RSU 34 has made a commitment to provide a safe environment. All personnel have a right to know about health hazards associated with their work. So that personnel can make knowledgeable decisions regarding personal risks, the Chemical Hygiene Plan includes policies, procedures, and responsibilities designed to develop an awareness of potentially hazardous conditions or chemicals and to train personnel in appropriate safe working conditions. It is important that employers assume responsibility for work site safety. All employees will have access to pertinent safety information through their supervisory staff. The people who work in any given environment are often best able to detect potential hazards in either the facility or work procedures. When safety concerns arise, employees are encouraged to contact their supervisor. This program is for the benefit and protection of all who use the school facility. It contains information on potential chemical hazards and how they should be handled.

I. RESPONSIBILITIES

Specific to this Chemical Hygiene Plan for RSU 34, district employees and students all have responsibilities to conform to this standard. The Superintendent of Schools is ultimately responsible for chemical hygiene within and will, with other administrators, provide continuing support for institutional chemical hygiene. 29 CFR 1910.1450 (e)(3)(vii) and Appendix A(B). A Chemical Hygiene Advisory Committee will be formed to assist the Superintendent of his/her designee with implementing, auditing, and updating the Chemical Hygiene Plan.

A. Administration Responsibilities

Appoint a Chemical Hygiene Advisory Committee.

Implement a Chemical Hygiene Plan conforming to the OSHA Lab Standard (29 CFR 1910.1450).

Ensure that employees receive training regarding the Chemical Hygiene Plan.

Allocate staff time for regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment and an annual chemical inventory.

Maintain a record of all chemical exposures and provide employee access to these records as well as any medical records.

Ensure confidentiality of all personal records.

Provide resources to ensure that facilities and equipment align with requirements of the Plan.

Phase out mercury in the school district, per Department of Environmental Protection regulations.

Ensure that the local Fire Department receives a copy of the annual chemical inventory.

B. Chemical Hygiene Advisory Committee Responsibilities

Work with the administration and staff to develop and implement appropriate chemical hygiene policies and practices.

Monitor procurement, use and disposal of chemicals in the lab, including determining that facilities and training levels are adequate for the chemicals in use.

Perform regular safety audits.

Maintain Material Safety Data Sheets (MSDS) for science laboratory chemicals and other materials present in the schools as required by regulations.

Oversee annual chemical inventory. Provide a copy of the current chemical inventory to the front office and local first responders.

Submit a copy of the current annual inventory to the Department of Education by September 1 of each year as referenced in Informational Letter #35 dated October 1, 2010.

Maintain current knowledge of legal regulations regarding laboratory and chemical safety. Coordinate annual review of the Chemical Hygiene Plan (CHP) by science and other appropriate staff.

Coordinate annual hazardous waste disposal for science department.

Oversee maintenance of appropriate spill kits and materials.

Maintain communication with administration regarding the CHP.

Provide training to colleagues, including administrators, teachers, and facilities staff.
Submit budget for maintenance of lab equipment and inspections.

C. Teacher Responsibilities

Plan and conduct each laboratory operation in accordance with the Chemical Hygiene Plan and safe work practices.

Maintain uncluttered laboratory workspaces and emergency exits.

Develop good personal chemical hygiene habits.

Align curriculum with Chemical Hygiene Plan.

Teach good personal chemical hygiene habits.

Ensure that students meet their lab safety responsibilities.

Prohibit unsupervised work by students.

Prepare an annual chemical inventory of all chemicals in their work space. The chemical storage room will be considered part of the adjoining Laboratory. Submit the annual inventory by August 15 of each year.

Plan and conduct each laboratory exercise with the least toxic materials.

Obtain and review MSDS prior to requesting new chemical.

Annually submit a list of experiments and materials needed to the CHO.

Label, use, and dispose of each chemical as required.

Maintain laboratory safety equipment.

Maintain spill kits that are consistent with type and amount of chemicals used.

D. Student Responsibilities

Understand the experimental procedure before starting to work in the laboratory.

Become familiar with the properties and hazards of the chemicals in use.

Obey all safety rules and regulations.

Wear appropriate personal protective equipment as instructed.

Clean personal work area immediately after use.

Keep personal workspace in an uncluttered condition.

Follow good housekeeping practices.

Always engage in appropriate behavior (i.e. no horseplay).

Conduct only the experiments assigned by the instructor.

Perform no unauthorized or unsupervised experiments.

Never remove chemicals from the laboratory.

Never work in the laboratory unless authorized to do so.

Never work alone in the laboratory.

Report chemical spills and accidents to teacher immediately.

E. Custodian Responsibilities

Understand and follow chemical and hazardous waste management regulations and best practices.

Clean science laboratories and storage areas with caution.

Report chemical spills to the school administrator. Clean up spills only after proper training.

II. BASIC SAFETY RULES AND PROCEDURES

"The Chemical Hygiene Plan shall include...standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." 29 CFR 1910.1450(e)(3)(i) and Appendix A(E)

Users of the science labs, including students, must:

1. Adhere to the intent and procedures of this CHP.
2. Know:
 - location of eyewash fountains, safety showers, fire blankets, fire extinguishers, first aid kits, and emergency exits;
 - proper response in case of an emergency;
 - proper use of safety equipment;
 - hazards of the materials being used;
 - how to interpret information from a Material Safety Data Sheet.
3. Read labels carefully to ensure use of the right chemical.
4. Refrain from horseplay, games, or pranks in the laboratory.
5. Dispose of all waste materials according to instructions.
6. Follow local, state, and federal disposal requirements.
7. Report any accidents or unsafe conditions immediately.
8. Assume any chemical mixture is more toxic than its most toxic component.
9. Assume substances of unknown toxicity to be toxic.
10. Receive proper safety equipment training.
11. Never underestimate the risk of any chemicals.
 - Do not eat, drink, or apply cosmetics in the laboratory.
 - Do not taste any chemical.
 - Do not smell chemicals directly.
 - Do not pipette solutions by mouth.
12. Wash hands with soap and water before leaving the laboratory, even if you have been wearing gloves.
13. Promptly flush skin exposed to chemicals with water.

III. CHEMICAL PROCUREMENT

29CFR1910.1450 Appendix A(D)

Before a chemical is procured, proper handling, storage and disposal methods must be known to those responsible.

Chemicals will be purchased in quantities no larger than a two year supply. If the minimum packaging amount is larger than a two year supply the smallest available amount will be purchased.

Whenever practical, chemicals will be purchased as pre-diluted solutions to minimize mixing, secondary labeling, and the chance for improper labeling and storage.

No container will be accepted without an adequate label and material safety data sheet.

RSU 34 will follow a purchasing policy and procedures to minimize large quantities of chemicals and/or extremely hazardous chemicals from entering the schools.

No chemical will be purchased in quantities greater than a two-year supply. (Ch. 161 Maine Department of Education regulations)

Requests for procurement of new chemicals will be made through the appropriate building administrator. Any concerns about the safety of a requested chemical should be brought to the attention of the building principal..

All chemicals will be received at Old Town High School by the building principal or his/her designee.

RSU 34 will not accept donations of chemicals from outside sources without review by the to insure that the material is:

- needed by the RSU;
- useful to the RSU as donated;
- a quantity no greater than a two-year supply; and
- not a hazardous waste at the donating organization.

RSU 34 will follow Maine's Hazardous Waste Management Rules, Chapter 850 Section (3)(A)(4)(xvii) & (xviii) for applicable exclusions and procedures for transfer.

IV. CONTROL MEASURES

"The Chemical Hygiene Plan shall include... criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices...." 29 CFR 1910.1450(e)(3)(ii)

A. Engineering Controls

Engineering controls are the preferred methods of minimizing exposure to chemicals. Controls must be maintained in proper working order. Engineering controls must not be modified unless testing indicates the changes will not reduce protection.

All staff will Report improper functioning of engineering controls immediately.

Laboratory Hoods – will be used for all chemical procedures involving volatile substances with a permissible exposure limit (PEL) less than 50 ppm.

Work practices for hoods:

- The sash will be kept closed when not in use.
- When in use, the sash height will be as low as practical.
- No chemicals will be stored inside the hood.
- The hood will not be used for disposal of volatile chemicals.
- Users will minimize interference with the inward flow of air to the hood.
- Face velocity will be maintained between 75 and 125 feet per minute.

Storage cabinets for flammable and hazardous chemicals will be provided and ventilated as needed in compliance with state and federal regulations. The flammable cabinet will be either direct vented to the outside or not vented with bungs left in place.

All acids will be stored in an acid cabinet.

Nitric Acid will be stored by itself in a separate acid cabinet.

A general ventilation system will be maintained for each lab with air intakes and exhausts located so as to avoid intake of contaminated air.

B. Protective Clothing and Equipment

Instructors will ensure that clothing worn in the laboratory offers protection from splashes and spills, is easily removable in case of an accident, and is fire resistant. Instructors will conduct a personal protective equipment (PPE) hazard assessment to determine appropriate PPE for conditions, equipment and chemicals being used. Activities requiring PPE and type of PPE required are as follows: *See Appendix F for Risk checklist.*

<u>Activity</u>	<u>Type of PPE required</u>
Chemical handling	Chemical goggles
Chemical handling	Aprons
Chemical handling	Gloves as required by MSDS

Since chemical handling, glassware manipulation, etc. are ongoing activities during laboratory activities, all students and staff will wear appropriate safety goggles and aprons while in the laboratory setting.

Students and staff will wear appropriate PPE to avoid chemical exposure.

Eye protection will be worn during chemical transfer and handling.

Sandals, perforated shoes, or bare feet are not allowed in labs.

Shorts and skirts will not be worn unless an apron is worn.

Gloves appropriate to the materials and task will be provided. All gloves have a breakthrough time. The teacher will comply with manufacturer's recommendations.

The school will provide required PPE for all employees at no cost.

The school will provide required PPE for students at no cost.

The user must inspect PPE before each use. Defective personal protective equipment will not be used and will be reported building administrator by the teacher.

Each science laboratory will have:

- Access to a drench-type safety shower;
- An eyewash fountain;
- An approved Fire Blanket; and
- An ABC fire extinguisher.

A telephone is located in each lab.

Fire alarms are located in the hall adjacent to the laboratory.

C. Housekeeping

Each instructor is responsible for keeping his or her workspace clean and is jointly responsible for common laboratory areas.

Unobstructed access will be maintained to emergency equipment such as showers, eyewash, fire extinguishers, fire blankets, and emergency exits.

Work areas will be kept clean and uncluttered, with chemicals and equipment properly labeled and stored. All work areas will be cleaned at the end of each operation or each day. At the end of each work session, all gas and water outlets

will completely shut off when not in use and all items used in the experiment will be returned to their proper storage location.

Chemical wastes will be disposed of according to Department of Environmental Protection hazardous waste or solid waste rules. (Refer to chapters 850 and 851.)

All gas cylinders will be secured.

Any spills on the floor or bench will be immediately cleaned up.

D. Hazardous Material Handling and Storage

All federal, state, and local regulations for material handling storage and waste disposal will be followed.

The Chemistry Instructor(s) will oversee the chemical storage room(s).

All chemicals will be stored according to chemical compatibility.

Chemicals will be segregated by hazard classification and compatibility in a well-identified area with local exhaust ventilation.

Appropriate shelving and cabinets will be used. Metal clips used to hold shelves will be inspected for corrosion and replaced as necessary.

Flammable liquids will be stored in approved fire cabinets. Where possible, flammable cabinets will be vented to the outdoors. If not possible to vent to the outdoors, the cabinet will not be vented at all (the bungs will be left in place).

Chemicals will not be stored on the floor (except gas cylinders) or above eye level.

Gas cylinders will be properly secured, segregated according to compatibility, and stored upright and away from heat sources.

Access to chemical storage areas will be restricted through signage and secure locks.

No student or unauthorized faculty will be allowed in storage area unsupervised.

Shelves holding containers will be inspected to ensure that they are secure. All shelves will have anti-roll lips attached to prevent chemicals from falling.

The warning labels on newly received chemicals will be immediately read to be aware of any special storage precautions like refrigeration or inert atmosphere storage.

Storage of chemicals will not be allowed at the lab bench or areas outside the designated chemical storage room, such as in aisles, stairwells or hallways or on desks or floors.

A complete inventory of chemicals in the chemical storage room will be maintained.

Science chemicals will be inventoried annually. The annual inventories will be filed with the Old Town Fire Department.

Any chemicals identified during the inventory as expired, outdated, unlabeled, unknown, or unwanted will be listed for disposal. See Waste Disposal section.

The acquisition dates will be marked on all peroxide forming chemicals, and they will be tested for peroxides or disposed of after six months.

Spill cleanup supplies (absorbents, neutralizers) will be provided in any room used for chemical storage or use.

Exhaust air from the stockroom will be ducted directly to the outside

Refrigerators, if used to store chemicals, will be explosion-proof, or of explosion safe design only. Standard refrigerators that have not been converted will never be used to store flammable chemicals; a spark from a light bulb may ignite flammable vapors. Food will not be stored in the refrigerator in any lab.

Chemicals will be dated upon receipt, dated for appropriate disposal, and dated when opened.

The Chemistry Instructors will examine stored chemicals at least monthly for container integrity. Chemical containers will also be checked for rust, corrosion, and leakage.

Chemical labels will state name of chemical, be firmly attached to the container, list hazards, and name responsible party (manufacturer).

Chemical labels will be readable and free from chemical encrustation.

A clear access to and from the storage areas will be maintained. Where possible, two separate exits shall be provided in chemical storage areas.

Highly toxic chemicals (those with LD 50 of 50 mg/kg) will be purchased only when no alternative exists.

Containers of highly toxic chemicals that have been opened will be stored in secondary containers.

E. Inspections

The teacher assigned to the laboratory is responsible for activating safety showers and eyewash fountains weekly to flush the lines and to verify proper operation.

The teacher assigned to the laboratory is responsible for assuring that fume hoods are monitored to ensure adequate airflow (75-125 linear feet per minute is recommended.).

The head custodian is responsible for making sure fire extinguishes are the correct type (ABC), at recommended pressure, are easily accessible, and are inspected monthly. Fire extinguishers should be securely mounted on the wall and a sign indicating their location posted above the fire extinguisher.

Users will inspect personal protective equipment prior to each use.

In addition to daily walk-through inspections, the Building Principal is responsible for conducting safety inspections in each lab monthly to monitor housekeeping and to make sure safety equipment is working.

V. MEDICAL PROGRAM

"The Chemical Hygiene Plan shall include provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section." 29 CFR 1910.1450(e)(3)(vi) and (g)

A. Medical Consultation and Examination

When employees or supervisors suspect that an employee has been exposed to a hazardous chemical to a degree and in a manner that might cause harm to the victim, the victim is entitled to a medical consultation and examination without cost or loss of pay to the employee. Medical records shall be retained according to state and federal laws in accordance with 29 CFR 1910.1020.

The events and circumstances that might result in overexposure to a chemical are:

- A hazardous chemical leaked, was spilled, or otherwise released in an uncontrolled manner.

- A hazardous chemical was spilled on the skin or splashed in the eye.

A person might display signs or symptoms that would indicate overexposure to a hazardous chemical. Those signs or symptoms include but not limited to; rash, headache, nausea, coughing, tearing, irritation or redness of eyes, irritation of nose or throat, dizziness, loss of motor dexterity or judgment.

This District has arranged for Old Town Family Practice to provide medical consultations/examinations in the event of chemical exposure.

B. Exposure Assessment

All chemical exposure incidents shall be documented on an accident report form along with any action taken. If no further action is taken, the reason for that decision should be included. In this RSU the building principal is responsible for investigating chemical exposure incidents. *See Appendix A* for accident reporting procedure.

Method for investigating exposure incidents in this RSU:

The investigating person shall document the following;

- a. The identity of the hazardous chemical(s) or material(s) to which the employee(s) may have been exposed.
- b. A description of the conditions under which the exposure occurred including quantitative exposure data if available,
- c. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

At that time a decision will be made whether medical consultation /examination is warranted.

For examinations or consultations provided to employees, a written opinion from the examining physician shall be obtained by the building principal. It shall include:

- a. Recommendations for further medical follow-up,
- b. Results of the examination and associated tests,
- c. Any medical condition revealed that places the employee at an increased risk of exposure to a hazardous substance found in the workplace, and
- d. A statement that the employee has been informed of the results of the examination or consultation.

C. First Aid

Personnel trained in first aid will be available during work hours. The following have received first aid training and are expected to render first aid:

School Nurse

The closest emergency room with medical personnel is Eastern Maine Medical Center.

VI. SIGNS AND LABELS

29CFR1910.1450 Appendix A (D)(8)

The following signs and/or labels will be posted prominently in the laboratory (*See Appendix H*):

Emergency telephone numbers of emergency personnel, emergency facilities, administration, and the laboratory instructor.

Rescue:	911
Fire:	911
Police:	911
Poison Control:	1-800-442-6305
Central Administration:	207-827-7171
Lab Instructor:	(each school will list its instructors)

Labels on all chemicals and other containers indicating the contents (including waste receptacles) and associated hazards.

Location of exits, safety showers, eyewash station, fire extinguisher, fire blanket, and other safety equipment.

All laboratory refrigerators will be labeled "NO FOOD STORAGE ALLOWED".

Warnings will be placed at areas or equipment where special or unusual hazards exist.

VII. SPILLS AND ACCIDENTS

29CFR1910.1450 Appendix A (D)(9)

In the event of a spill, staff must contact the building principal before beginning cleanup. The building principal or other authorized person will assess the nature of the spill using the School's Emergency Response Plan to determine appropriate response. Copies of the Emergency Response Plan for this school are located at the school's Main Office.

The responsible staff will evacuate all persons from the spill or accident area until certain that the spill is not hazardous to people in the general area.

The building principal or designee is responsible for writing the accident report. The District Central Office will maintain accident records.

Each student, teacher and staff member must know immediately what to do and where to go in case of any emergency.

At each school the Building Administrator is responsible for promptly addressing the needs of people who may have been exposed.

The building principal Department report the spill to the local police department.

All waste generated from a chemical spill will be treated as hazardous waste.

Custodians and faculty cannot respond to chemical spills unless appropriate training and equipment has been provided.

VIII. WASTE DISPOSAL

"Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal, of waste laboratory chemicals." 29 CFR 1910.1450 (Appendix A (D)(11)).

Prior to the start of each semester, an inventory of stored chemical wastes (including virgin chemical stock identified as waste) shall be completed and submitted to the building principal.

The building principal and science faculty will coordinate hazardous waste disposal. Waste will be collected for disposal at least yearly.

Indiscriminate disposal by pouring waste down the drain or adding them to the general trash is unacceptable. It is not permissible to neutralize quantities of > 500 milliliters of corrosive hazardous waste or evaporate, distill, filter, or burn other waste chemicals.

If large quantities of hazardous chemical wastes are being stored or if a container is full, a hazardous waste pick-up should be scheduled within 180 days of the container becoming full.

The Maintenance Director is responsible for all hazardous waste manifests and associated paperwork.

No waste pick-ups will be scheduled during regular school hours.

All chemical wastes destined for hazardous waste disposal must be stored in the designated, signed hazardous waste storage area in appropriate DOT approved shipping containers and segregated for compatibility.

All containers must have the following information on the label:

"Hazardous Waste"

The chemical contents,

The date that waste was first put in and

The date the container was filled.

Alton Elementary School and the Viola Rand School in Bradley are on septic systems.

No liquid chemicals, other than appropriate cleaning chemicals, will be disposed of down the drain. Non-hazardous liquid chemicals may be solidified for solid waste disposal (i.e. put in the trash). Custodians must be notified of any chemical put in the trash for disposal. Hazardous waste must not be disposed of down the drain or in the trash. Hazardous waste must be disposed of by a licensed hazardous waste transporter at a facility licensed to accept hazardous waste.

Old Town Elementary School, Leonard Middle School, Old Town High School and Southern Penobscot Regional Program are on municipal sewage systems.

On a municipal sewer system:

Non-hazardous liquid may be disposed of down the drain with the permission of the Old Town Pollution Control. Telephone 827-3970

Corrosive hazardous waste, which is hazardous only due to pH (i.e. no contaminants of heavy metals, solvents, etc.), and which is less than 500 milliliters in quantity, may be neutralized to a non-hazardous waste prior to disposal. Non-hazardous liquid chemicals may also be solidified for solid waste disposal (i.e. put in the trash). Custodians must be notified of any chemical put in the trash for disposal.

IX. INFORMATION AND TRAINING

29CFR1910.1450(f)

All staff who work with or are exposed to hazardous materials, including food service staff, maintenance workers, custodians, and teachers of laboratory science will receive yearly hazardous materials training. Employees will receive training at the time of employment and prior to assignments involving new exposure situations.

Teachers are responsible for teaching students about hazards and safe practices. Employees shall receive information and training to ensure they are aware of the hazards of chemicals that are present in their work area. This training will include the following:

- The contents of OSHA Lab Standard and appendices; and
- Location and availability of Chemical Hygiene Plan, chemical safety reference materials, including Material Safety Data Sheets and the Permissible Exposure Limits for OSHA regulated substances.

In RSU 34

A copy of the Chemical Hygiene Plan and Material Safety Data Sheets is kept in the administrative office of each school, the Maintenance Office, and the Central Office.

Additional safety information is kept in each science laboratory and areas where hazardous chemicals are used including:

MSDS

Signs and symptoms associated with exposure to hazardous chemicals.

Methods and observations that may be used to detect the presence or release of a hazardous chemical (visible appearance, odor, monitoring equipment, etc.).

The hierarchy of protective measures such as engineering controls, work practices, personal protective equipment, and emergency procedures to protect students and staff from overexposure to hazardous chemicals.

Emergency procedures to be used in case of a spill or exposure, including clean up methods and equipment needed.

Instructions for use of fire extinguishers and other emergency equipment.

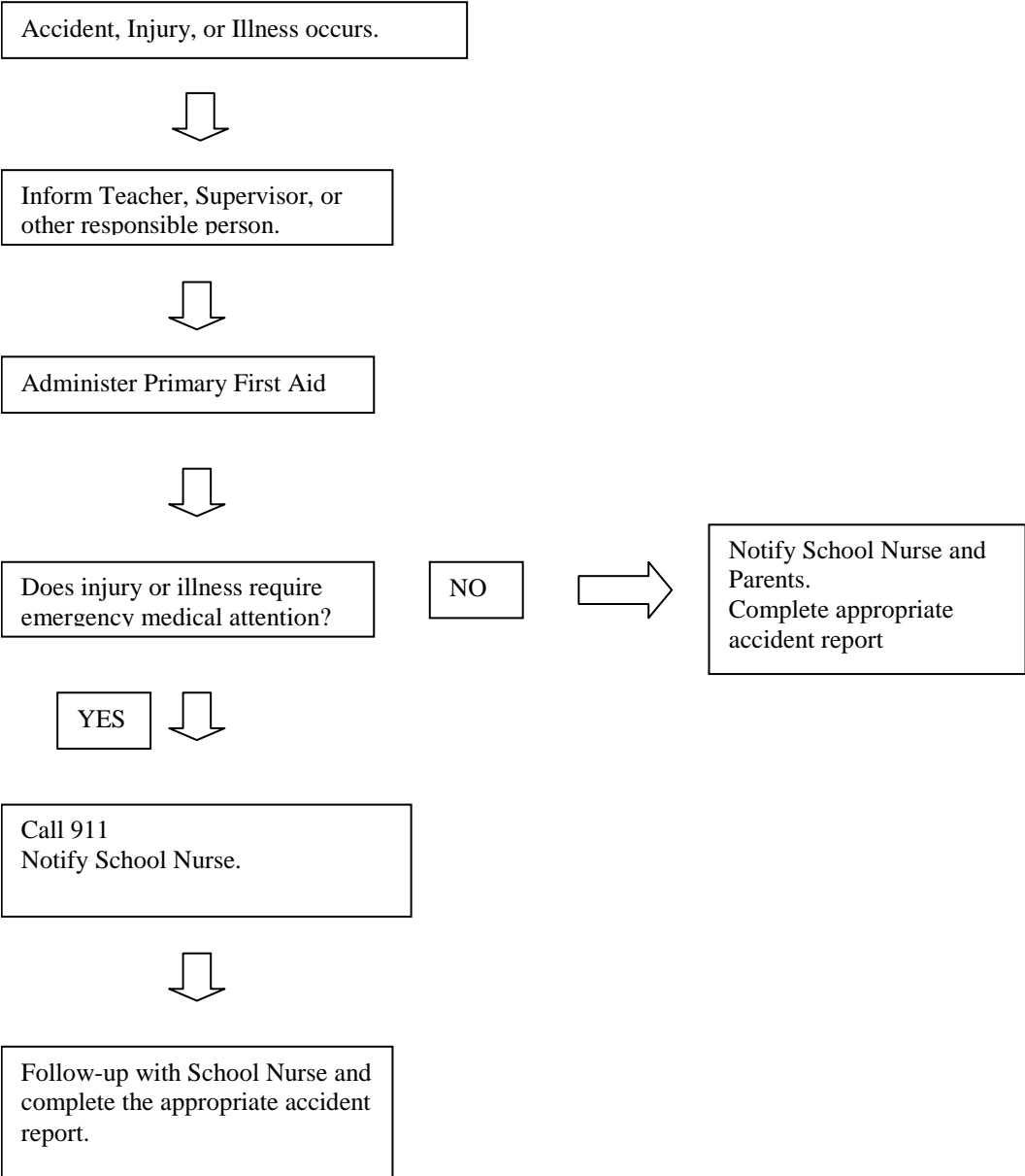
X. ANNUAL CHEMICAL HYGIENE PLAN AUDIT

29CFR1910.1450 (e)(4)

In each facility of RSU 34, the building supervisor will conduct an audit of all phases of the Chemical Hygiene Plan each year. He or she will provide audit results to the Superintendent of Schools, who are responsible for taking corrective action.

Appendix A

ACCIDENT REPORTING PROCEDURE



Appendix B

Water Reactive Chemicals

Alkali metals, such as Na, Li, K

Halides of nonmetals, such as BCl₃, BF₃, PCl₃, PCl₅, SiCl₄, S₂Cl₂

Anhydrous metal halides, such as AlCl₃, TiCl₄, ZrCl₄, SnCl₄

Phosphorus pentoxide

Calcium carbide

Acetic acid anhydride

Chemicals Which Will Undergo Spontaneous Ignition

Alkali metals such as Na, K

Metal powders, such as Al, Co, Fe, Mg, Mn, Pd, Pt, Ti, Sn, Zn, Zr

Metal hydrides, such as NaH, LiAlH₄

Phosphorus (white)

Appendix C

Oxidizing Chemicals

Chemicals Which Increase the Rate of Combustion

Aluminum nitrate	Perchloric acid 60% or less
Ammonium persulfate	Potassium chlorate
Barium chlorate	Potassium dichromate
Barium peroxide	Potassium nitrate
Calcium chlorate	Potassium persulfate
Calcium nitrate	Silver nitrate
Calcium peroxide	Silver nitrite
Cupric nitrate	Sodium perborate
Hydrogen peroxide	Sodium perchlorate
Lead nitrate	Sodium persulfate
Lithium hypochlorite	Strontium chlorate
Lithium peroxide	Strontium nitrate
Magnesium nitrate	Strontium nitrite
Magnesium perchlorate	Thorium nitrite
Magnesium peroxide	Uranium nitrate
Nickel nitrate	Zinc chlorate
Nitric acid 70% or less	Zinc peroxide

Cause Spontaneous Ignition

Calcium hypochlorite	Potassium permanganate
Chromic acid	Sodium chlorite (>40%)
Hydrogen peroxide (27.52%)	Sodium peroxide
Nitric acid	Sodium permanganate
Potassium bromate	

Chemicals Which Decompose with Catalyst or Heat

Ammonium dichromate	Calcium hypochlorite (>50%)
Hydrogen peroxide (52-91%)	Perchloric acid (60-72.5%)

Chemicals Which Cause Explosive Reactions when exposed to Catalyst, Heat, Shock, or Friction

Ammonium perchlorate	Perchloric acid
Ammonium permanganate	

Appendix D

Common Peroxide Forming Chemicals

Severe Peroxide Hazard on Storage with Exposure to Air
Discard within 3 months

Ethers	Potassium amide
Potassium metal	Sodium amide (sodamide)

Peroxide Hazard on Concentration
Do not distill or evaporate without first testing for the presence of peroxides.
Discard or test for peroxides after 6 months

Cyclohexene
Cyclopentene
Diacetylene (butadiene)
Diethyl ether (ether)
Dimethyl ether

Hazard of Rapid Polymerization Initiated by Internally Formed Peroxides

Normal Liquids
Discard or test for peroxides after 6 months

Vinyl acetate
Styrene

Normal Gases
Discard after 12 months

Butadiene
Tetrafluroethylene (TFE)

Appendix E

Toxic Metals and Metal Compounds

This is a list of metals and metal compounds which could be expected to be encountered in a school lab setting it is only a partial list of toxic metals and their compounds.

Antimony, antimony compounds
Arsenic, arsenic compounds
Barium, soluble compounds, sulfate
Boron, borates, boron halides
Cadmium, salts
Chromium, compounds
Iron salts, soluble
Lead, salts, organo compounds
Manganese compounds
Mercury metal, compounds, organo compounds
Molybdenum compounds
Nickel compounds
Selenium compounds
Silver compounds, soluble
Tin compounds, inorganic and organic
Tungsten compounds, soluble
Uranium compounds
Zinc, chromates, oxide dust

Appendix F

Laboratory Task Risk Evaluation

Hazards/ Potential Hazards:

Chemical (Vapor/Dust)	Noise	Thermal
Fire/Explosion	Non-Ionizing Radiation	Ergonomic
Biological	Other	

Notes: _____

Accident Probability	Low	Moderate	High
Accident Severity	Low	Moderate	High

Personal Protective Equipment:

Required PPE

Eyes	Hand
Face	Body
Head	Hearing
Foot	Respiratory

Personal Protective Equipment

Hand Protection

Chemical Resistant Gloves*
 Cloth Gloves (Utility)
 Leather Gloves
 Thermal Resistant Gloves
 Rubber Gloves

Face/ Eye Protection

Chemical Splash Goggles
 Safety Glasses with Side Shields
 Face Shield
 Welding Mask
 Welding Goggles

Torso Protection

Chemical Resistant Clothing
 Chemical Resistant Apron
 Long Sleeved Shirt
 Long Sleeved Coveralls
 Welder's Jacket

Hearing Protection

***Hand Protection** (Glove Material) - Consult MSDS for appropriate material.

- | | |
|--------------------|-------------------------------|
| 1. Butyl Rubber | 5. Polyvinyl Alcohol Plastic |
| 2. Natural Rubber | 6. Polyvinyl Chloride Plastic |
| 3. Neoprene Rubber | |
| 4. Nitrile Rubber | |

Appendix G

First Aid Kits

On -site first aid kits should contain supplies that allow individuals to treat themselves.

Examples:

- 1) Band-Aids of several sizes and shapes,
- 2) Gauze pads and one inch tape for a wound larger than Band-Aid size.

The most important first aid procedure for minor cuts and abrasions is to clean the wound thoroughly with soap and water.

Reasons for keeping First Aid Kits simple are:

1. Injuries should be formally evaluated by the School Nurse or other responsible person to assure proper care, documentation, and follow-up of the accident.
2. Students and untrained staff should not be involved in the care of wounds due to risks with exposures to blood and body fluids,
3. Medications, such as decongestants, analgesics, and antihistamines, are not emergency supplies.

Advanced first-aid equipment should be supplied only when personnel are trained in its use and are available.

Appendix H

Emergency Telephone Numbers

Rescue: 911

Fire: 911

Police: 911

Poison Control: 1-800-442-6305

Central Office: 827-7171

Appendix I

OSHA LAB STANDARD

1910.1450 - Occupational Exposure to Hazardous Chemicals in Laboratories

Standard Number: 1910.1450

Standard Title: Occupational Exposure to Hazardous Chemicals in Laboratories.

SubPart Number: Z

SubPart Title: Toxic and Hazardous Substances

(a) Scope and application

(1) This section shall apply to all employers engaged in the laboratory use of hazardous chemicals as defined below.

(2) Where this section applies, it shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR part 1910, subpart Z, except as follows:

(i) For any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of paragraph (a)(2)(iii) of this section apply.

(ii) Prohibition of eye and skin contact where specified by any OSHA health standard shall be observed.

(iii) Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for an OSHA regulated substance with exposure monitoring and medical surveillance requirements paragraphs (d) and (g)(1)(ii) of this section shall apply.

(3) This section shall not apply to:

(i) Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in 29 CFR part 1910, subpart 2, even if such use occurs in a laboratory.

(ii) Laboratory uses of hazardous chemicals which provide no potential for employee exposure. Examples of such conditions might include:

(A) Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

(B) Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

(b) Definitions

"**Action level**" means a concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

"**Assistant Secretary**" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

"Carcinogen" (see "select carcinogen").

"Chemical Hygiene Officer" means an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

"Chemical Hygiene Plan" means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of paragraph (e) of this section.

"Combustible liquid" means any liquid having a flashpoint at or above 100 deg. F (37.8 deg. C), but below 200 deg. F (93.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (93.3 deg. C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

"Compressed gas" means:

(i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F (21.1 deg. C); or

(ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F (54.4 deg. C) regardless of the pressure at 70 deg. F (21.1 deg. C); or

(iii) A liquid having a vapor pressure exceeding 40 psi at 100 deg. F (37.8 C) as determined by ASTM D-323-72.

"Designated area" means an area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, such as a laboratory hood.

"Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

"Employee" means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

"Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

"Flammable" means a chemical that falls into one of the following categories:

(i) **"Aerosol, flammable"** means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) **"Gas, flammable"** means:

(A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.

(iii) **"Liquid, flammable"** means any liquid having a flashpoint below 100 deg. F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg.

C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

"Flashpoint" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 - 1979 (ASTM D 56-79)) - for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (See American National Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester, Z11.7 - 1979 (ASTM D 93-79)) - for liquids with a viscosity equal to or greater than 45 SUS at 100 deg. F (37.8 deg. C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

"Hazardous chemical" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendices A and B of the Hazard Communication Standard (29 CFR 1910.1200) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for purposes of this standard.

"Laboratory" means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

"Laboratory scale" means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

"Laboratory-type hood" means a device located in a laboratory, enclosure on five sides with a movable sash or fixed partial enclosed on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air

contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

"Laboratory use of hazardous chemicals" means handling or use of such chemicals in which all of the following conditions are met:

- (i) Chemical manipulations are carried out on a "laboratory scale;"
- (ii) Multiple chemical procedures or chemicals are used;
- (iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and
- (iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

"Medical consultation" means a consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

"Organic peroxide" means an organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

"Oxidizer" means a chemical other than a blasting agent or explosive as defined in 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

"Physical hazard" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer pyrophoric, unstable (reactive) or water-reactive.

"Protective laboratory practices and equipment" means those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

"Reproductive toxins" means chemicals which affect the reproductive chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

"Select carcinogen" means any substance which meets one of the following criteria:

- (i) It is regulated by OSHA as a carcinogen; or
 - (ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program(NTP)(latest edition);
- or
- (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for research on Cancer Monographs (IARC)(latest editions); or
 - (iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following

criteria:

- (A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
- (B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or
- (C) After oral dosages of less than 50 mg/kg of body weight per day.

"Unstable (reactive)" means a chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become selfreactive under conditions of shocks, pressure or temperature.

"Water-reactive" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

(c) Permissible exposure limits

For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR part 1910, subpart Z.

(d) Employee exposure determination

(1) Initial monitoring - The employer shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).

(2) Periodic monitoring. If the initial monitoring prescribed by paragraph (d)(1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of the relevant standard.

(3) Termination of monitoring. Monitoring may be terminated in accordance with the relevant standard. ...1910.1450(d)(4)

(4) Employee notification of monitoring results. The employer shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

(e) Chemical hygiene plan

General. (Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan).

(1) Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

(i) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

(ii) Capable of keeping exposures below the limits specified in paragraph (c) of this section.

(2) The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.

(3) The Chemical Hygiene Plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection; ..

- (i) Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;
- (ii) Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;
- (iii) A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;
- (iv) Provisions for employee information and training as prescribed in paragraph (f) of this section;
- (v) The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation;
- (vi) Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section;..
- (vii) Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer, and, if appropriate, establishment of a Chemical Hygiene Committee; and
- (viii) Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:
 - (A) Establishment of a designated area;
 - (B) Use of containment devices such as fume hoods or glove boxes;
 - (C) Procedures for safe removal of contaminated waste; and
 - (D) Decontamination procedures.
- (4) The employer shall review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary.
- (f) Employee information and training**
 - (1) The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.
 - (2) Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.
 - (3) Information. Employees shall be informed of:
 - (i) The contents of this standard and its appendices which shall be made available to employees;
 - (ii) the location and availability of the employer's Chemical Hygiene Plan;
 - (iii) The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;
 - (iv) Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

(v) The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, Material Safety Data Sheets received from the chemical supplier. ..

(4) Training.

(i) Employee training shall include:

(A) Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(B) The physical and health hazards of chemicals in the work area; and

(C) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

(ii) The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

(g) Medical consultation and medical examinations

(1) The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

(i) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

(ii) Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

(iii) Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

(2) All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

(3) Information provided to the physician. The employer shall provide the following information to the physician:

(i) The identity of the hazardous chemical(s) to which the employee may have been exposed;

(ii) A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

(iii) A description of the signs and symptoms of exposure that the employee is

experiencing, if any.

(4) Physician's written opinion.

(i) For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

(A) Any recommendation for further medical follow-up;

(B) The results of the medical examination and any associated tests;

(C) Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and

(D) A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment. ..

(ii) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

(h) Hazard identification

(1) With respect to labels and material safety data sheets:

(i) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

(ii) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

(2) The following provisions shall apply to chemical substances developed in the laboratory:

(i) If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in paragraph (b) of this section. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under paragraph (f) of this section.

(ii) If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement paragraph (e) of this section. ..

(iii) If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.120) including the requirements for preparation of material safety data sheets and labeling.

(i) Use of respirators

Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.

(j) Recordkeeping

(1) The employer shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by this standard.

(2) The employer shall assure that such records are kept, transferred, and made

available in accordance with 29 CFR 1910.1020.

(k) Dates

(1) Effective date. This section shall become effective May 1, 1990.

(2) Start-up dates.

(i) Employers shall have developed and implemented a written Chemical Hygiene Plan no later than January 31, 1991.

(ii) Paragraph (a)(2) of this section shall not take effect until the employer has developed and implemented a written Chemical Hygiene Plan.

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