EPD Laboratory
Laboratory Safety/
Chemical Hygiene Plan
&
Fire Safety Plan

Access to this Chemical Hygiene Plan & Fire Safety Plan shall be available within the laboratory for reference purposes; the official copy of this Chemical Hygiene Plan & Fire Safety Plan resides on the official Georgia EPD website at https://epd.georgia.gov/about-us/epd-laboratory-operations. Printed copies of this SOP will contain a watermark indicating the copy is an uncontrolled copy.

EMERGENCY PHONE NUMBERS

FIRE	9-911
AMBULANCE	9-911
NORCROSS POLICE	9-770-448-2122
POISON INFORMATION CENTER	9-404-616-9000

Revision 4
June 3, 2021

Laboratory Director — Mark Talbert — 08/19/2021

Laboratory QA Manager — Jeffrey Moore — 08/19/2021

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Laboratory Safety and Chemical Hygiene Plan Certification Statement

I have received a copy of the EPD Laboratory *Laboratory Safety and Chemical Hygiene Plan* and have read the contents of this plan. I have been given the opportunity to review and ask questions about this plan.

I have viewed the following videotapes and documentation on laboratory or workplace safety:

☐ *Orientation to Laboratory Safety*
☐ *Planning for Laboratory Emergencies*
☐ *Material Safety Data Sheets*
☐ *Flammables and Explosives*
☐ *Safety Showers and Eye Washes*
☐ *Laboratory Hoods*
☐ *Preventing Contamination*
☐ *Electrical Safety in the Laboratory*
☐ *Compressed Gas Cylinders in the Laboratory*
☐ *Safe Handling of Laboratory Glassware*

This certification statement should be signed and a copy placed in my training file.

_____ _____
Signature of EPD Laboratory Employee Date Signed

_____
Printed Name of EPD Laboratory Employee

Laboratory Safety/Chemical Hygiene Plan

1. SAFETY POLICY AND PROCEDURES

The policy of the Georgia Department of Natural Resources is to provide the EPD Laboratory with a safe and healthful work environment. Serious attempts will be made to minimize recognizable hazards. It is the intent of the Department to comply with all occupational health, safety, and fire regulations and recommended practices. The implementation of this policy is the responsibility of the managerial and supervisory staff. Directors, Lab Managers and Laboratory Associates will be held accountable for the health and safety of employees engaged in activities under their supervision. Supervisors must insist that employees and contracted personnel comply with health and safety rules and work in a safe and considerate manner. Fostering a positive attitude towards health and safety shall be the responsibility of all staff. Employees must understand their responsibility is to comply with health and safety rules issued by the Laboratory and their supervisors. Employees are encouraged to report all unsafe conditions to their supervisors. The Department has the authority to assure overall compliance with the intent of this policy.

SAFETY PROCEDURES

1.1. Arrangement of furniture and equipment for safe and efficient use:
(a) Aisles between benches should be at least 4 ft. wide to provide adequate room of passage of personnel and equipment. Laboratory carts should at no time impede egress.

(b) Desks should be isolated from benches or adequately protected.

(c) Every Laboratory should have an eyewash station and a safety shower.

1.2. Hoods and Ventilation:
(a) Adequate hood facilities should be provided where toxic or flammable materials are used.

(b) Hoods should be adequately vented to the outside of the building.

(c) Makeup air should be supplied for hoods that take air from the room.

(d) Exhaust fans and electrical switches should be spark proof if inflammatory materials are to be used and hoods used with corrosive fumes should be corrosive resistant.

(e) Controls for all services should be located in the front of the hood and should be operable when the hood door is closed.

(f) All laboratory rooms should have the air changed continuously at a rate consistent with

the materials being handled.

1.3. Electrical Services:

(a) Electrical services, both 110 and 220 volts, should be provided in an adequate amount to prevent any overloading of circuits.

(b) Noninterchangeable plugs should be provided for multiple electrical services.

(c) Electrical outlets should be of the three-pole type to provide for adequate grounding.

(d) Place circuit breaker number on all major pieces of electrical equipment. In case of an emergency, one will not need to look up the number or try circuit breakers.

1.4. Storage:

(a) Laboratories should provide for adequate storage space for mechanical equipment records and supplies that will not be used regularly.

(b) Large quantities of flammable solvents should be stored in metal safety cans. Containers larger than one gallon should be stored outside the laboratory.

(c) All flammable solvents stored in the laboratory should be kept to a minimum. Those that are stored in the laboratory should be stored in solvent cabinets with proper ventilation.

(d) Explosion-proof refrigerators should be used for the storage of flammable standards and solutions.

(e) Cylinders of compressed gases should not be stored in the lab. Cylinders in use should always be securely strapped in place.

(f) Store oxidizing chemicals separately from other chemicals, especially reducing chemicals. Avoid total alphabetized storage of others chemicals to prevent the unintentional mixing of acids and alkalies.

1.5. Housekeeping:

(a) Housekeeping plays an important role in reducing laboratory accidents. Rooms should be kept neat and orderly. Floors, shelves and benches should be kept free from dirt and clear of all apparatus, chemicals and solutions not in use. Spills of chemicals or water on the floors should be cleaned immediately to prevent falls or contact with the chemicals.

(b) A cluttered laboratory is a dangerous place to work. Maintenance of a clean and orderly work space is indicative of interest, personal pride and safety mindset.

(c) Passageways should be kept clear to all building exits and stairways.

1.6. Fire Protection:

(a) Fire extinguishers should be provided at convenient locations near potential fire sources

and personnel should be instructed in their use. In the event of a fire, employee's first reaction is to clear the room, evaluate the situation and return to extinguish the fire only if it can be done safely.

(b) Fire blankets should be provided at convenient sites in each laboratory.

(c) No Smoking is allowed anywhere in the laboratory building.

1.7. General Considerations:
(a) Broken or cracked glassware should be discarded.

(b) Glass cutting apparatus should not be operated without eye protection.

(c) Cutting of glass rods and glass tubes should be done with a cloth or paper towel over the area being cut or broken.

(d) Spills of strong acids and alkalies should not be left on lab benches where others may come in contact with them. Dilute spill with water, neutralize if practical and wipe up the liquid.

(e) Strong acids and alkalies should be stored as two groups of chemicals separate from other chemicals.

(f) Strong oxidizing agents should not be stored with oxidizable compounds or reducing chemicals.

(g) Laboratory chemicals improperly stored or handled can cause injury to personnel by virtue of their toxicity. Laboratory Supervisors should see that toxic compounds are stored, used and then disposed of properly. Personnel are strongly advised to review the MSDS for any chemical they are not familiar with prior to using the chemical.

(h) Every laboratory should post the name and telephone number of doctors to be called in an emergency requiring medical care.

(i) An industrial quality first aid kit should be in every laboratory. This kit should be well stocked at all times.

1.8. Handling of Potentially Hazardous Samples:
(a) Any sample originating from the Hazardous Waste Program should be considered hazardous, along with samples from unknown sites and samples originating from abandoned site cleanups.

(b) Hazardous samples entering the laboratory should be labeled properly as to the potential for harm to the analyst. A PHW (Potential Hazardous Waste) label should be placed on any sample suspected of being hazardous

(c) Samples moving from one laboratory to another should not be transferred without the original warnings and a copy of the original analysis report.

(d) Storage of hazardous samples should not be included with other samples to prevent gross contamination of "clean" samples.

(e) Hazardous samples should be stored in a safe manner and disposed of via official laboratory clean out procedures as soon as they are of any significant quantity.

1.9. Hazard Communication Program:

(a) State employees are covered under Georgia's "Right to Know" Law. This includes laboratory workers and others exposed to laboratory chemicals. There are four elements to the program as outlined below.

(b) A copy of the program document is provided to each Laboratory Manager. Employees can request an appointment to discuss “Right To Know” issues with the Laboratory Director at any time.

(c) Laboratory chemicals should be clearly labeled as to content and possible hazards.

(d) Material Safety Data Sheets (MSDS) for each chemical provides detailed information about hazards, exposure levels, toxicity, proper handling procedures and first aid techniques. The Lab Managers will have available at the work site all pertinent MSDS.

(e) Each employee will be trained in how to read the MSDS and how to properly handle the chemicals by the Laboratory Manager or Associate.

1.10. Appropriate Laboratory Dress:

(a) No shorts may be worn in the laboratory building.

(b) No open toed shoes may be worn in designated areas of the laboratory building.

(c) Labcoats and aprons are provided for your protection from chemical spills. All scientists and technicians are strongly encouraged to wear labcoats or aprons when working in the laboratory area.

(d) Eye protection must be worn in all designated areas of the laboratory building. All scientists and technicians are strongly encouraged to wear eye protection when working in the laboratory area.

(e) Gloves must be worn when handling potentially hazardous samples, solvents, and certain standards and chemicals. If you are uncertain of when gloves are required ask your supervisor or refer to the MSDS available in each laboratory.

1.11. Laboratory Injuries:

(a) Laboratory injuries requiring medical attention should be reported to your unit supervisor or manager promptly. Your unit supervisor or manager will make any needed arrangements.

(b) Promptly report any dangerous or potentially dangerous situation on laboratory property - both within the building and the surrounding grounds - to management.

2. THE OSHA LABORATORY STANDARD

Georgia state government agencies are exempt from OSHA standards. It is the intent of the EPD Laboratory to meet many of the OSHA Laboratory standards. The basis for this standard (29 CFR 1910.1450) is a determination by the Occupational Safety and Health Administration (OSHA), after careful review of the complete rule-making record, that laboratories typically differ from industrial operations in their use and handling of hazardous chemicals and that a different approach than that found in OSHA's substance specific health standards is warranted to protect workers. The final standard applies to all laboratories that use hazardous chemicals in accordance with the definitions of laboratory use and laboratory scale provided in the standard. Generally, where this standard applies it supersedes the provisions of all other standards in 29 CFR, Part 1910, Subpart Z, except in specific instances identified by this standard. For laboratories covered by this standard, the obligation to maintain employee exposures at or below the Permissible Exposure Limits (PELs) specified in 29 CFR, Part 1910, Subpart Z is retained. However, the manner in which this obligation is achieved will be determined by each employer through the formulation and implementation of a Chemical Hygiene Plan (CHP). The CHP must include the necessary work practices, procedures and policies to ensure that employees are protected from all potentially hazardous chemicals in use in their work area. The Laboratory Standard defines a hazardous chemical as any element, chemical compound or mixture of elements and/or compounds which is a physical hazard or a health hazard. Hazardous chemicals as defined by the final standard include not only chemicals regulated in 29 CFR Part 1910, Subpart Z, but also any chemical meeting the definition of hazardous chemical with respect to health hazards as defined in OSHA's Hazard Communication Standard, 29 CFR 1910.1200 (c).

Among other requirements, the final standard provides for employee training and information, medical consultation and examination, hazard identification, respirator use and recordkeeping. In addition, employers need to identify circumstances under which a particular laboratory operation, procedure, or activity require prior approval before implementation. To the extent possible, the standard allows a large measure of flexibility in compliance methods.

3. THE GEORGIA PUBLIC EMPLOYEE RIGHT-TO-KNOW ACT

In July 1988, the State of Georgia enacted the Employee Right-to-Know Act. The General Assembly found the health and safety of persons living and working in Georgia may be improved by providing access to information regarding hazardous chemicals to which they may be exposed either during their normal employment activities or during emergency situations. Many employers in the State of Georgia have already established suitable information programs for their employees as was required

of all manufacturing employers by July 1989 under the Federal Occupational Safety and Health Administration's Hazard Communication Standard. However, the Federal standard does not apply to State agency employers like the Department of Natural Resources. It is, therefore, the intent and purpose of the Act to provide accessibility to information regarding chemicals to employees who may be exposed to such chemicals in non-manufacturing employer workplaces. The Act also applies to the laboratory use of hazardous chemicals. The following excerpt is from the Georgia Department of Labor's *Public Employees Hazardous Chemicals Protection and Right to Know Rules.*

300-3-19-.02 Administration.

(2) Public Employer Responsibilities.

(a) Each public employer covered by the Act and these regulations shall ensure that all employees within the agency are aware of the Act, these regulations, and their responsibilities by means of a written hazardous chemical communication program.

(b) Each public employer shall designate a hazardous chemicals protection communication coordinator. The hazardous chemicals protection communication coordinator will be provided with authority sufficient to carry out the duties of the position.

3.1. An individual in an existing position within an agency may be assigned hazardous chemicals protection communication coordinator responsibilities as an additional duty.

3.2. The hazardous chemicals protection communication coordinator will assume the following responsibilities:
(i) Act as a liaison between the agency and the Safety Engineering Section of the Georgia Department of Labor on hazardous chemicals issues that may arise within his or her agency.
(ii) Determine applicability of these rules to individual workplaces and work areas within his agency using on-site inspections, review of written records including Material Safety Data Sheets, and industrial hygiene studies.
(iii) Make arrangements for and/or provide appropriate and adequate training to all employees.

(c) The hazardous chemicals protection communication coordinator will ensure that:

3.4. A written workplace-specific hazard communication program is developed for each workplace in the agency. This workplace-specific program will include a list of hazardous chemicals used, stored, or manufactured in that particular workplace, and will be available to all employees in the workplace.
3.5. Upon their request, employees at each workplace within their agency shall have access to the most current MSDS's for those chemicals used in that workplace which are included on the Georgia Right to Know Hazardous Chemicals List.

3.6. Employees at each workplace are made aware of and are properly trained in the uses and hazards associated with chemicals to which they are exposed in their workplaces.

3.7. Employee training on and notification of the use of hazardous chemicals in the workplace are adequately documented in each employee's personnel file.

3.8. Employees at each workplace within the agency are provided with personal protective equipment as required in each work environment, and receive adequate training on the use and maintenance of this equipment.

300-3-19-.03 Training.

(1) Frequency of Training.

(a) Each employee shall be provided with information and training as required by the Act and these regulations at the time of initial assignment to a workplace.

(b) Each employee shall be provided with periodic re-training regarding the hazards associated with the hazardous chemicals to which the employee is exposed. Such re-training must occur at least annually.

(c) An employee shall not be exposed to a hazardous chemical until the employee has been trained in its hazards.

(2) Content of Training. Training programs shall be tailored to the specific nature of each individual workplace and the educational levels of the employees. At a minimum, the information imparted to employees must include the following:

(a) The requirements of the Act.

(b) Identification of specific work areas in the workplace where hazardous chemicals are handled and/or produced.

(c) The location and content of the public employer's written hazardous chemical protection communication program.

(d) The purpose of a Material Safety Data Sheet, including the information contained therein.

(e) The labeling system used at the workplace and how to respond to an unlabeled container delivered to or discovered in the workplace.

(f) The various control measures to be used to minimize the employees' exposure to hazardous chemicals. Where applicable, this shall include information on:

3.9. The proper use, care, storage, selection, and fitting of respirators, and the elements of a respirator program;

3.10. The use of face shields, goggles, and safety glasses;

3.11. The use of appropriate gloves, aprons, protective clothing, and foot coverings;

3.12. The use of exhaust ventilation equipment; and

3.13. Work practices which reduce exposure to hazardous chemicals.

(g) The right of the employee's physician to receive hazardous chemical information.

(h) Methods of detecting an employee's exposure, such as air sampling, biological monitoring, visual detection, odor identification, warning properties of the hazardous chemicals used, and other standard industrial hygiene techniques.

(i) Emergency procedures, such as spill response and first aid.

(j) Proper storage of chemicals and separation of incompatible substances.

(k) Training in hazards associated with improper mixing of chemicals located in the employee's work area and potential hazards associated with exposure to chemical reaction products.

(l) Where additional information and training can be obtained.

(3) Training Format.

(a) All training sessions must include an opportunity for employees to ask questions.

(4) Training Activities.

(a) A written log of all training activities shall be maintained at the workplace. This log shall be retained for three (3) years after training has been completed.

(5) Employee Information Poster.

(a) Location.
3.14. A poster describing employee rights under the Act shall be posted in all workplaces covered by the Act in a prominent manner so that it is visible to all employees on a routine basis. For those workplaces with geographically dispersed work areas, a poster shall be placed in each work area.

(b) Content.

1. The Poster shall be worded as follows:

Employees of the State of Georgia
YOU HAVE THE RIGHT TO KNOW
ABOUT THE HAZARDOUS CHEMICALS
IN YOUR WORKPLACE.

Under the "Public Employee Hazardous Chemical Protection and Right to Know Act of 1988" you must be informed of the following:
* The Requirements of the law;
* Your right to receive information regarding hazardous chemicals faced on your job;
* Your right to receive formal training and education on hazardous chemicals;
* What a Material Safety Data Sheet is, and how to use it;
* Where hazardous chemicals are used in your work area;

* Your physician's right to receive information on the chemicals to which you may be exposed.

YOU CANNOT BE FIRED, DISCRIMINATED AGAINST, OR
DISCIPLINED FOR EXERCISING YOUR RIGHT TO KNOW

No pay, position, seniority, or other benefits may be lost for exercising your right to know. You may present a written request to receive a Material Safety Data Sheet for any chemical used on your job. You have the right to refuse to work with a hazardous chemical if a Material Safety Data Sheet in your employer's possession has not been provided to you within 5 working days after your written request, unless you are required to perform essential services.

GRIEVANCE PROCEDURE

3.15. File a grievance through the established procedure for your agency.
3.16. If unresolved, or if no established grievance procedure exists, then file a grievance with:
Commissioner of Labor
c/o Safety Engineering Section
Georgia Department of Labor
223 Courtland St. NE, Suite 301
Atlanta, Georgia 30303
(404)-656-2966

4. RESPONSIBILITY

4.1 Department Level

The development and implementation of a generic Chemical Hygiene Plan (CHP) shall be the responsibility of the Department of Natural Resources, Environmental Protection Division Laboratories. Approval of the generic CHP shall be the responsibility of the Chemical Hygiene Officer (CHO). The Laboratory Director shall appoint a Chemical Hygiene Officer (CHO) who will facilitate the requirements of the CHP. Other individuals may be appointed to assist the laboratory CHO with implementation of the CHP.

4.2. Laboratory Level

Laboratory Managers, and Associates are responsible for chemical hygiene in the laboratory. They must ensure that everyone know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided. They will conduct regular, informal chemical hygiene inspections of their facilities and equipment, know the current requirements concerning regulated substances, determine the required levels of protective apparel and equipment, and ensure that facilities and training for use of any material being ordered are adequate. Laboratory workers are responsible for planning and conducting each operation in accordance with chemical hygiene procedures and for developing good personal chemical hygiene habits.

4.3. Employee Rights and Responsibilities

Employees have the right to be informed about the known physical and health hazards of the chemical substances in their work areas and to be properly trained to work safely with these substances. Employees have the right to file a complaint if they feel they are being exposed to unsafe or unhealthful work conditions. Employees cannot be discharged, suspended, or otherwise discriminated against by their employer because of filing a complaint, or exercising their rights under the law. Employees have the responsibility to attend training seminars conducted by the Chemical Hygiene Officer and other laboratory supervisors on Laboratory Safety and Chemical Hygiene Plan and to stay informed about the chemicals used in their work areas. They have the responsibility to use work practices and protective equipment required for safe performance of their job. Finally they have the responsibility to inform their supervisors of accidents and conditions or work practices they believe to be a hazard to their health or to the health of others.

5. DEFINITIONs

Chemical Hygiene Officer	an employee who is designated by the employer, and who is qualified by training and 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	a reasonable written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by toxic substances used in the particular workplace.
Hazardous Chemical	any element, chemical compound or mixture of elements and/or compounds which is a physical hazard or a health hazard.

Laboratory	any facility where the "laboratory use of hazardous chemicals" occur. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.
Laboratory Scale	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.
Regulated Area	a laboratory, an area of a laboratory or device such as a laboratory hood for which access is limited to persons who are aware of the hazards of the substances in use and the precautions required.
Use of Hazardous Chemicals	handling or use of such chemicals in which all of the following conditions are met: (a) Chemical manipulations are carried out on a laboratory scale, (b) Multiple chemical procedures or chemicals are used, (c) The procedures involved are not part of a production process, nor in any way simulate a production process, and (d) Protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

6. SCOPE AND APPLICATION

6.1. This applies to all employees working in laboratories using hazardous chemicals.

6.2. This amends (for laboratories) all other provisions of 29 CFR 1910, Subpart Z except for PEL.

6.3. This does not apply to activities that do not fit the term "laboratory use." All staff working in laboratories must comply with this standard as well as the State of Georgia's Employee Right-to-Know Act.

6.4. This Chemical Hygiene Plan describes the EPD Laboratory's safety programs, including but not limited to personal protective equipment used, control equipment inventory and operations (such as vented hoods), employee training programs, medical programs, and safety inspections. The Chemical Hygiene Plan is designed as a tool to coordinate safety procedures. Every employee in the laboratory must be trained in the applicable details of this Plan.

7. LABELS AND MATERIAL SAFETY DATA SHEETS (MSDS)

7.1. With respect to labels and Material Safety Data Sheets:

(a) Supervisors shall ensure that labels on hazardous chemicals are not removed or defaced.
(b) Employers shall maintain any MSDS received and make them readily available to employees.

7.2. Chemical substances developed in the laboratory:

(a) If the composition of a chemical substance produced for laboratory use is known and determined to be hazardous, the employer shall supply appropriate training.
(b) If the chemical produced is a by-product whose composition is not known, the employer shall assume that it is hazardous and implement the Chemical Hygiene Plan.
(c) If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.1200) including the requirements for the preparation of a Material Safety Data Sheet and labeling. Each laboratory with the EPD Laboratory is the repository for MSDS. A Material Safety Data Sheet (MSDS) is a document containing chemical hazard and safe handling information and is prepared in accordance with the OSHA Hazard Communication Standard. An MSDS should be obtained for each chemical used in the laboratory. Chemical manufacturers and distributors must provide the purchasers of hazardous chemicals with an appropriate MSDS for each hazardous chemical or product purchased. If an MSDS was not provided with the shipment of a hazardous chemical, one should be requested from the manufacturer or distributor in a timely manner. If you wish to review an MSDS, contact your supervisor or the Chemical Hygiene Officer. If you need an MSDS for your work area file, contact your Chemical Hygiene Officer or the supervisor.

An example of a Material Safety Data Sheet is given in the following pages.

MSDS for ACETONE Page 1

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1 - PRODUCT IDENTIFICATION

PRODUCT NAME: ACETONE
FORMULA: (CH3)2CO
FORMULA WT: 58.08
CAS NO.: 67-64-1
NIOSH/RTECS NO.: AL3150000
COMMON SYNONYMS: DIMETHYL KETONE; METHYL KETONE; 2-PROPANONE
PRODUCT CODES: 9010,9006,9002,9254,9009,9001,9004,5356,A134,9007,9005,9005
9008
EFFECTIVE: 08/27/86
REVISION #02

PRECAUTIONARY LABELLING
BAKER SAF-T-DATA(TM) SYSTEM

HEALTH - 1 SLIGHT
FLAMMABILITY - 3 SEVERE (FLAMMABLE)
REACTIVITY - 2 MODERATE
CONTACT - 1 SLIGHT
HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

SAFETY GLASSES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

PRECAUTIONARY LABEL STATEMENTS

DANGER
CAUSES IRRITATION
EXTREMELY FLAMMABLE
HARMFUL IF SWALLOWED OR INHALED
KEEP AWAY FROM HEAT, SPARKS, FLAME. AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE - WATER MAY BE INEFFECTIVE. FLUSH SPILL AREA WITH WATER SPRAY.

SAF-T-DATA(TM) STORAGE COLOR CODE: RED (FLAMMABLE)

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2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
ACETONE	90-100	67-64-1

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3 - PHYSICAL DATA

BOILING POINT: 56 C (133 F) VAPOR PRESSURE(MM HG): 181

MSDS for ACETONE Page 2

MELTING POINT: -95 C (-139 F) VAPOR DENSITY(AIR=1): 2.0

SPECIFIC GRAVITY: 0.79 (H2O=1) EVAPORATION RATE: ~10 (BUTYL ACETATE=1)

SOLUBILITY(H2O): COMPLETE (IN ALL PROPORTIONS) % VOLATILES BY VOLUME: 100

APPEARANCE & ODOR: CLEAR, COLORLESS LIQUID WITH A FRAGRANT SWEET ODOR.

---

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP: -18 C (0 F) NFPA 704M RATING: 1-3-0

FLAMMABLE LIMITS: UPPER - 13.0 % LOWER - 2.6 %

FIRE EXTINGUISHING MEDIA
USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE.
(WATER MAY BE INEFFECTIVE.)

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
VAPORS MAY FLOW ALONG SURFACES TO DISTANT IGNITION SOURCES AND FLASH BACK. CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE.

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5 - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 1780 MG/M3 (750 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 2375 MG/M3 (1000 PPM)

PERMISSIBLE EXPOSURE LIMIT (PEL): 2400 MG/M3 (1000 PPM)

TOXICITY:
LD50 (ORAL-RAT)(MG/KG)	-	9750
LD50 (ORAL-MOUSE)(MG/KG)	-	3000
LD50 (IPR-MOUSE)(MG/KG)	-	1297
LD50 (SKN-RABBIT) (G/KG)	-	20

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
VAPORS MAY BE IRRITATING TO SKIN, EYES, NOSE AND THROAT.
INHALATION OF VAPORS MAY CAUSE NAUSEA, VOMITING, HEADACHE, OR LOSS OF

CONSCIOUSNESS.
LIQUID MAY CAUSE PERMANENT EYE DAMAGE.
CONTACT WITH SKIN HAS A DEFATTING EFFECT, CAUSING DRYING AND IRRITATION.

MSDS for ACETONE Page 3

INGESTION MAY CAUSE NAUSEA, VOMITING, HEADACHES, DIZZINESS, GASTROINTESTINAL IRRITATION.
CHRONIC EFFECTS OF OVEREXPOSURE MAY INCLUDE KIDNEY AND/OR LIVER DAMAGE.

TARGET ORGANS
RESPIRATORY SYSTEM, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

ROUTES OF ENTRY
INHALATION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.
IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

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6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, SOURCES OF IGNITION

INCOMPATIBLES: HALOGEN ACIDS AND HALOGEN COMPOUNDS, STRONG BASES, STRONG OXIDIZING AGENTS, CAUSTICS, AMINES AND AMMONIA, CHLORINE AND CHLORINE COMPOUNDS, STRONG ACIDS, ESP. SULFURIC, NITRIC, HYDROCHLORIC

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SUITABLE PROTECTIVE CLOTHING. SHUT OFF IGNITION SOURCES; NO FLARES, SMOKING, OR FLAMES IN AREA. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH AREA WITH WATER.

J. T. BAKER SOLUSORB(R) SOLVENT ADSORBENT IS RECOMMENDED FOR SPILLS OF THIS PRODUCT.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: U002 (TOXIC WASTE)

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8 - PROTECTIVE EQUIPMENT

MSDS for ACETONE Page 4

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP TO 5000 PPM, A GAS MASK WITH ORGANIC VAPOR CANNISTER IS RECOMMENDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING APPARATUS WITH FULL FACE SHIELD IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, BUTYL RUBBER GLOVES ARE RECOMMENDED.

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9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: RED (FLAMMABLE)

SPECIAL PRECAUTIONS
BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID. KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED, FLAMMABLE LIQUID STORAGE AREA.

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10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	ACETONE
HAZARD CLASS	FLAMMABLE LIQUID
UN/NA	UN1090
LABELS	FLAMMABLE LIQUID
REPORTABLE QUANTITY	5000 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME	ACETONE
HAZARD CLASS	3.1
UN/NA	UN1090
LABELS	FLAMMABLE LIQUID

8. CHEMICAL INVENTORIES

The OSHA Laboratory Standard requires employees to be trained in the hazards of the chemicals present in the workplace. As a result, laboratories should develop inventories to assure proper

training for all chemicals is provided. An annual inventory can reduce the number of unknowns and the tendency to stockpile chemicals.

9.0 SAFE HANDLING/SHIPPING of HAZARDOUS MATERIALS and SAFETY GUIDELINES

9.1 Safe Handling of Chemicals

Know the physical and health hazards associated with the chemical(s) you are using. Consider the physical state (gas, liquid, or solid) of the material(s). Consider the process in which you are using the chemical(s), the facilities you have for storage of the materials, and the facilities and equipment you may need to handle an emergency. Know the procedures necessary for safe disposal of the chemicals. Questions you should consider:

(a) Is the material flammable, explosive, corrosive, or reactive?
(b) Is the material toxic, and if so, how can one be exposed to the material (inhalation, skin or eye contact, accidental ingestion, accidental puncture)?
(c) What kind of ventilation does one need for protection? What kind of personal protective equipment (i.e. gloves, respirator, goggles) does one need for protection?
(d) Will the process generate other toxic compounds, or could it result in a fire, explosion, etc.?
(e) Are the proposed storage facilities appropriate for the type of materials required? How can incompatible materials be segregated?
(f) What possible accidents can occur and what steps should be taken to minimize the likelihood and impact of an accident?
(g) What are the proper procedures for disposal of the chemical(s)?

Once the potential hazards associated with the chemical(s) have been evaluated and the process has been evaluated, one can design the process and work procedures to minimize or eliminate the hazards. The Chemical Hygiene Plan provides work procedures and engineering controls, which can be used to minimize or eliminate hazards in the laboratory. Additional information on chemical hazards and health hazard control measures can be found in the references found in texts within the laboratory.

9.2.1 Hazardous Materials Shipping Guidelines

The EPD Laboratory Sample Custodian has over all responsibility for the shipment of hazardous materials and dangerous goods including packaging and documentation. The Sample Custodian's name will appear on all documentation of hazardous materials as the shipper of record. No other staff member may ship hazardous materials. The Sample Custodian must be certified to handle hazardous materials and dangerous by completing a DOT approved course. Additional requirements are presented below and must be reviewed on an annual basis by all staff members.

9.2.2 Hazardous Material Classification

A hazardous material is defined as a substance or material that has been determined by the Department of Transportation to be capable of posing an unreasonable risk to health, safety and property. It is the responsibility of the EPD Laboratory Sample Custodian and each staff member to properly classify materials that are subject to the Hazardous Materials Regulations and to determine whether a material is regulated by the requirements of 49 CFR. See Table below

Department of Transportation Hazard Classes

Class	Name of Class	49 CFR Section
1.1 - 1.6	Explosives	173.50
2.1 - 2.3	Flammable, non-flammable, or toxic gases	173.115
3	Flammable/combustible liquids	173.120
4.1 - 4.3	Solids that are flammable, spontaneously combustible, or dangerous when wet	173.124
5.1 - 5.2	Oxidizers and organic peroxide	173.127 and 173.128
6.1 - 6.2	Toxic and infectious substances	173.132 and 173.134
7	Radioactive	173.403
8	Corrosives	173.136
9	Miscellaneous hazardous materials	173.140

9.2.3 Packaging

Hazardous Material containers must meet DOT specifications or UN performance standards for the transportation of hazardous materials and wastes. Packaging material must be compatible with the intended contents. It is the Sample Custodian's responsibility to evaluate the effectiveness of material packaging and ensure the use of authorized packaging that meet the requirements of 49 CFR 173.24. and other applicable sections. See 49 CFR 173.27 for packages that require air shipment.

A container of hazardous material or waste must always remain closed unless it is necessary to add or remove contents from the container. Closures must be designed in such a manner that under normal conditions it will not allow the escape of the container's contents. Filling limits of each container must not be exceeded.

9.2.4 Class 2 Pressurized Gas Packaging Requirements

Requirements for Class 2 pressurized gases are presented in subpart G of Part 49 CFR 173. Subpart G includes the following sections that may relate to laboratory shipments:

- Shipping compressed gasses in cylinders and spherical pressure vessels
- Charging non-liquefied compressed gasses, compressed gases in solutions and liquefied compressed gases

- Shipping limited quantities of gases
- Shipping fire extinguishers
- Shipping cryogenic liquids

9.2.5 Labeling

It is the Sample Custodian's responsibility to apply the required labels to all hazardous material shipping containers. When reusing original shipping containers for compressed gas calibration standards the Sample Custodian will inspect the package to ensure the correct labeling is on the package. Label design and color are specific to denote a particular hazard class or division. It must be apparent to anyone handling the material or responding to a release as to possible dangers associated with the contents of the package. Specific labels are identified in 49 CFR 172.101 for shipping name, class and hazard label. Labels may be printed or affixed to a surface of the package or container. Labels may not be placed on the bottom of the package or container. The label should also be placed near the shipping name and clearly visible. When primary and secondary hazard labels are placed on the same package, the labels must be within 6 inches of each other. Hazardous materials forbidden on passenger aircraft but permitted on cargo aircraft must be labeled with the CARGO AIRCRAFT ONLY label.

9.2.6 Shipping Documentation

The Sample Custodian is responsible for properly completing shipping documents. This requirement applies to all hazardous materials shipped from the EPD Laboratory. This policy also applies to all hazardous waste shipments originating from the EPD Laboratory. The Sample Custodian will verify that the information on the shipping documentation accurately describes the hazardous materials being shipped and in accordance with DOT and EPA regulations. The Sample Custodian is the only EPD Laboratory staff member allowed to sign the shipping documentation certifying that the shipment has been properly prepared according to DOT and EPA requirements. Shipping documentation will include:

- Basic description of hazardous material
- Total quantity of material and unit of measure
- Shipper's certification statement
- Shipper's signature
- Emergency information including contact information

9.2.7 Security and Emergency Response

Shippers of certain hazardous materials are required to develop a written security plan and train their employees on the specifics of the plan. The requirements of the regulation identify the following hazardous materials:

- Highway route-controlled quantities of Class 7 radioactive materials
- More than 25kg (55 lbs) of Division 1.1, 1.2, or 1.3 explosive materials
- More than 1 L (1.06 qt) per package of any material that is extremely toxic by inhalation
- Hazardous materials in bulk packaging having a capacity of 13,248 L (3,500 gal) or more liquids or gases or 13.24 cubic meters (468 cubic feet) or more for solids
- Hazardous materials, not in a bulk package, of 2,268 kg (5,000 lbs) gross weight or more of class for which placecarding of the vehicle, rail car, or freight container is required
- Any quantity of hazardous material that requires placarding

- Select agents or toxins regulate by the Centers for Disease Control and Prevention under 42 CFR 73 or the U.S. Department of Agriculture under 9 CFR 121

A comprehensive inventory of chemicals in use at the EPD Laboratory has failed to locate any chemicals that would fall under the requirements of this section. Therefore a written security plan is not required.

9.2.8 Hazardous Materials and Dangerous Goods Records

All original documentation associated with the shipping of hazardous materials and dangerous goods shall be retained indefinitely. All original documentation will be archived in the files of the Sample Custodian. Copies may be retained in the individual laboratory sections, but original documentation will be retained under the control of the Sample Custodian.

10. ACTIVITIES REQUIRING PRIOR APPROVAL

The Chemical Hygiene Officer and Laboratory Managers have determined particular laboratory operations, procedures or activities which require approval before implementation. These operations are listed below.

Note: OSHA requires each employer to identify those activities which the employer believes to be of a sufficiently hazardous nature to warrant prior "employer approval" before implementation. Departments need to identify activities which involve extremely toxic chemicals, select carcinogens and reproductive hazards, and those activities with a high potential for personal injury and property damage. Departments will also need to identify existing activities subject to the requirements of this section. Except for the most hazardous activities, "employer approval" will occur at the local level (e.g. Lab Manager or Chemical Hygiene Officer).

10.1. Activities Requiring Prior Approval

(a) When specified in project write-up of new capital projects
(b) All class IV lasers
(c) Potentially explosive laboratory reactions
(d) Reactions using highly toxic, radioactive or carcinogenic chemicals
(e) Large scale operations (e.g. 22 liter volume or greater)
(f) Unattended operations, or longer than a normal eight-hour shift
(g) High pressure/low pressure operations (explosion/implosion hazards)

11. PHYSICAL HAZARDS/SPECIAL PRECAUTIONS

"Physical hazard" refers to a chemical for which there is evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water reactive. Materials that present a physical hazard can be safely used if the specific hazard(s) are understood, and measures are taken to address the hazards. If appropriate precautions are not taken, a fire, an explosion, unwanted corrosion, personal injury, or property damage could occur. Certain chemicals cannot be safely mixed or stored with other chemicals because a severe

reaction can take place or an extremely toxic reaction product can result.

Before a substance is received, information on the proper handling, storage, and disposal of the chemical should be known to all individuals handling the compound. No container will be accepted without an adequate identifying labels. Chemical and samples are received through the shipping and receiving area. The quantities of chemicals stored in the laboratory should be as small as is practical. Storage on bench tops or in hoods will not be permitted.

Proper chemical storage is needed to avoid storing incompatible chemicals together. The specific storage requirements for certain chemical groups is important. Table 11-1 lists chemicals that should not be stored together or have special storage requirements.

Table 11-1: List of Incompatible Chemicals

These chemicals	Should NOT be stored with these chemicals
Acids	Bases, metals
Oxidizing agents: chlorates, chromates, chromium trioxide, dichromates, halogens, halogenating agents, hydrogen peroxide, nitric acid, nitrates, perchlorates, peroxides, permangenates, persulfates	Reducing agents: ammonia, carbon, metals, metal hydrides, nitrites, organic compounds, phosphorous, silicon, sulfur
Acetylene and monosubstituted acetylenes (RC≡CH)	Group IB & IIB metals and salts, halogens, halogenating agents
Ammonia (anhydrous, aqueous)	Halogens, halogenating agents, mercury, silver
Alkali & alkali earth carbides, hydrides, hydroxides, metals, oxides, peroxides	Water, acids, halogenated organic compounds, halogenating agents, oxidizing agents
Azides, inorganic	Acids, heavy metals & salts, oxidizing agents
Cyanides, inorganic	Acids, strong bases
Mercury & amalgams	Acetylene, ammonia, nitric acid, sodium azide
Nitrates, inorganic	Acids, reducing agents
Nitric acid	Bases, chromic acid, chromates, metals, permanganates, reducing agents, sulfides, sulfuric acid
Nitrites, inorangic	Acids, oxidizing agents
Organic compounds	Oxidizing agents

These chemicals	Should NOT be stored with these chemicals
Organic acyl halides	Bases, organic hydroxy- and amino- compounds
Organic anhydrides	Bases, organic hydroxy- and amino- compounds
Organic halogen compounds	Group IA, IIA metals, aluminum
Organic nitro compounds	Strong bases
Oxalic acid	Mercury & salts, Silver & salts
Phosphorous	Oxidizing agents, oxygen, strong bases
Phosphorous pentoxide	Alcohols, strong bases, water
Sulfides, inorganic	Acids
Sulfuric acid (concentrated)	Bases, potassium permanganate, water

11.1. Special Precautions for Working with Flammables and Combustibles

Flammable/Combustible Liquids: Materials which under standard conditions can generate sufficient vapor to cause a fire in the presence of an ignition source. The vapors of these materials are invisible, and a vapor trail to an ignition source away from the immediate area can result in a flashback. Flammables are more hazardous at elevated temperatures due to more rapid vaporization. In addition, flammable and combustible materials react with oxidizers which can result in a fire. A flammable liquid is any liquid having a flashpoint below 100°F, and are also known as Class I liquids. Class I liquids are further divided as follows:
Class IA - Flashpoints below 73°F (22.8C) and boiling points below 100°F (37.8C)
Class IB - Flashpoints below 73°F (22.8C) and boiling points at or above 100°F (37.8C)
Class IC - Flashpoints at or above 73°F (22.8C) and boiling points below 100°F (37.8C)

(a) Eliminate ignition sources such as open flames, smoking materials, hot surfaces, sparks from welding or cutting, operation of electrical equipment, and static electricity. Post conspicuous "No Smoking" signs in areas where flammable materials are used or stored.
(b) Minimize the quantity kept in the work area.
(c) Store in approved flammable liquid containers (safety cans) and storage cabinets, or in a special storage room designed for that purpose. Store away from oxidizers. Ensure that no more than 60 gallons of Class I liquids are stocked in a storage cabinet.
(d) Flammable liquids stored in glass containers shall not exceed 1 quart. Exception: for conditions where chemical purity must be protected, flammable liquids stored in glass containers shall not exceed 1 gallon. Refer to Table 11-2 below for maximum container sizes.
(e) Refrigerators and freezers used for the storage of flammables shall be explosion proof or lab safe.
(f) Assure there is proper bonding and grounding when it is required, such as when transferring or dispensing a flammable liquid from a large container or drum. Assure bonding and grounding is

checked periodically.
(g) Assure appropriate sprinkler system and/or fire extinguishers are in the area.

Table 11-2: Maximum Table Allowable Flammable Liquid Container Sizes

Container Type	Class IA	Class IB	Class IC
Glass or Approved Plastic	1 pint (0.5L)	1 quart (1L)	1 gallon (4L)
Metal (not DOT drums)	1 gallon (4L)	5 gallons (20L)	5 gallons (20L)
Safety Cans	2 gallons (8L)	5 gallons (20L)	5 gallons (20L)
Metal Drums (DOT specs)	2 gallons (8L)	5 gallons (20L)	5 gallons (20L)

11.2. Special Precautions for Working with Corrosives

Corrosives: Materials which can react with the skin causing burns similar to thermal burns, and/or which can react with metal causing deterioration of the metal surface. Acids and bases are corrosives.

(a) Containers and equipment used for storage and processing of corrosive materials should be corrosion resistant.
(b) Eye protection and rubber gloves should always be used when handling corrosive materials. A face shield, rubber apron, and rubber boots may also be appropriate, depending on the work performed.
(c) When mixing concentrated acids with water, add the acid slowly to water. Never add water to acid.
(d) Acids and bases should be stored separately from each other. Organic acids should be stored with flammable materials, separate from oxidizers and oxidizing acids.
(e) An eyewash and safety shower must be readily accessible to areas where corrosives are used and stored. In the event of skin or eye contact with corrosives, immediately flush the area of contact with cool water for 15 minutes. Remove all affected clothing. Seek medical assistance.

11.3. Special Precautions for Working with Oxidizers

Oxidizers: Materials which react with other substances by accepting electrons and undergoing reduction. This reaction may result in fire or explosion. The intensity of the reaction depends on the oxidizing-reducing potential of the materials involved. Oxidation reactions are the most frequent cause of chemical accidents. Examples of oxidizers include: potassium hypochlorate, sodium isolate, potassium peroxide, sulfuric acid, and perchloric acid.

(a) Know the reactivity of the materials involved in the experiment or process. Assure there are not extraneous materials in the area which could become involved in a reaction.

(b) If the reaction can be violent or explosive, use shields or other methods for isolating the materials or the process.
(c) Use the minimum amounts necessary for the procedure. Do not keep excessive amounts of the material in the vicinity of the process.
(d) Store properly in a cool, dry area, away from organic materials, flammable materials and reducers.

11.4. Water Reactive Materials:

Materials which react with water to produce a flammable or toxic gas, or other hazardous condition. Often a fire or explosion results. Special precautions for safe handling of water reactive materials will depend on the specific materials, and the conditions of use and storage. Contact the Department Chemical Hygiene Officer or the Department of Occupational Health and Safety for information on the safe use of a specific material. Examples of water reactives include alkali metals such as lithium, sodium, and potassium; acid anhydrides, and acid chlorides.

11.5. Pyrophoric Materials:

Materials which ignite spontaneously upon contact with air. Often the flame is invisible. Examples of pyrophoric materials are silane, silicon tetrachloride, white or yellow phosphorous, and fine powders of cadmium, calcium, iron, lead, zinc and manganese. Pyrophorics should be used and stored in inert environments or in desiccators in a cool area of the laboratory.

11.6. Special Precautions for Working with Peroxidizables

Peroxidizables: Materials which react with oxygen to form peroxides which can explode with impact, heat, or friction such as removing a lid. Since these chemicals may be packaged in an air atmosphere, peroxides can form even though the container has not been opened. Examples of peroxidizables include ethyl ether, tetrahydrofuran, isopropyl ether, liquid paraffins (alkanes), and olefins (alkenes).

(a) Date all peroxidizables upon receipt and upon opening. Unless an inhibitor has been added by the manufacturer, materials should be properly disposed of after 18 months from the date of receipt or 3 months from the date of opening.
(b) Do not open any container which has obvious crystal formation around the lid.
(c) Other special precautions are similar to those used for flammables.

11.7. Special Precautions for Working with Light-Sensitive Materials

Light-Sensitive Materials: Materials which react in the presence of light, forming new compounds which can be hazardous, or resulting in conditions such as pressure build-up inside a container which may be hazardous. Examples of light sensitive substances include ethyl ether, mercuric iodide, and sodium iodide.

(a) Store light-sensitive materials in a cool, dark place in amber colored bottles or other containers

which reduce or eliminate penetration of light.
(b) Date containers on receipt and upon opening, and dispose of surplus material after one year if unopened or 6 months if opened.

11.8. Special Precautions for Working with Shock-Sensitive or Explosive Materials

Shock-Sensitive/Explosive Materials: Compounds which can spontaneously release large amounts of energy under normal conditions, or when struck, vibrated, or otherwise agitated. Some chemicals become increasingly shock-sensitive with age. Of great concern in the laboratory is the inadvertent formation of explosive or shock-sensitive materials such as peroxides, perchlorates (from perchloric acid), and azides.

(a) Contact the Chemical Hygiene Officer when work with shock-sensitive or explosive materials is planned or when it is suspected that the inadvertent formation of shock-sensitive materials in ductwork, piping, or chemicals being stored has occurred.
(b) Date all containers of explosive or shock-sensitive materials upon receipt and when opened. Unless an inhibitor has been added, unopened shock-sensitive materials should be discarded within 12 months after receipt. Open containers of shock-sensitive materials should be discarded within 6 months of the date opened.
(c) Use the minimum amount of materials necessary for a procedure. Keep a minimum amount of material on hand.
(d) If there is a chance of explosion, use barriers or other methods for isolating the materials or the process.

11.9. Special Precautions for Working with Compressed Gases

Compressed Gases: Special systems are needed for handling materials under pressure. Toxic and corrosive gases present special problems in designing engineering controls. The pressure hazard compounds other hazards which may be associated with a material.

(a) Always use the smallest size cylinder required to perform the work.
(b) Cylinders of compressed gases must be handled as high energy sources.
(c) When storing or moving a cylinder, have the cap securely in place to protect the stem. Use suitable racks, straps, chains, or stands to support cylinders during use, storage or transportation.
(d) Use an appropriate cart to move cylinders.
(e) Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out.
(f) Oil or grease on the high pressure side of an oxygen cylinder can cause an explosion. Do not lubricate an oxygen regulator or use a fuel gas regulator on an oxygen cylinder.
(g) Always wear goggles or safety glasses with side shields when handling compressed gasses.
(h) Always use appropriate gauges, fittings, and materials compatible with the particular gas being handled.
(i) When work with toxic, corrosive, or reactive gases is planned, the Chemical Hygiene Officer should be contacted for information concerning specific handling requirements for the gas involved. Generally, these gases will need to be used and stored with local exhaust ventilation such as a lab hood or a gas cabinet designed for that purpose.

11.10. Special Precautions for Working with Cryogens

Cryogens: Some of the hazards associated with cryogens are fire, pressure, embrittlement of materials, and skin or eye burns upon contact with the liquid. Cryogens condense oxygen from the air, creating an oxygen rich atmosphere, increasing potential for fire if flammable or combustible materials and a source of ignition are present. Pressure is a hazard because of the large expansion ratio from liquid to gas, causing pressure to build up in containers. Many materials become brittle at extreme low temperatures. Brief contact with materials at extreme low temperatures can cause burns similar to thermal burns.

(a) Equipment should be kept clean, especially when working with liquid or gaseous oxygen.
(b) Mixtures of gases or fluids should be strictly controlled to prevent formation of flammable or explosive mixtures.
(c) For flammable cryogens the precautions provided in the "Flammable/Combustible Materials" section of this booklet should be used.
(d) Always wear safety glasses with side shields or goggles when handling cryogens. If there is a splash or spray hazard, a full face protector, an impervious apron or coat, cuffless trousers, and high topped shoes should be worn. Watches, rings, and other jewelry should not be worn. Gloves should be impervious and sufficiently large to be readily thrown off should a cryogen be spilled. Pot holders could also be used. Respirators may be required if the cryogen is toxic and sufficient local exhaust ventilation is not available.
(e) Containers and systems containing cryogens should have pressure relief mechanisms.
(f) Containers and systems should be capable of withstanding extreme cold without becoming brittle.

12. HEALTH HAZARDS/SPECIAL PRECAUTIONS

"Health Hazard" refers to chemicals 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. This term includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

For many toxic materials, hygienic standards have been established and action must be taken to assure personnel do not receive exposures in excess of these standards. These standards may be referred to as Threshold Limit Values (TLVs) or Permissible Exposure Limits (PELs).

The MSDS will list the hygienic standard for the hazardous chemical or each component of a mixture. In addition, the Chemical Hygiene Officer has a complete listing of published TLVs and PELs and other works concerning the subject of industrial toxicology. If you would like to conduct a more thorough review of a particular compound, or if you would like an evaluation of the exposure to a specific material used in your work area, contact the Chemical Hygiene Officer.

Protection from health hazards is provided by assuring exposure to such hazards is minimized or eliminated. To minimize the exposure, it is necessary to determine the route by which the exposure may occur, i.e., inhalation, skin contact, puncture, ingestion, or a combination of exposure routes.

12.1. Special Precautions for Working with Allergens

Allergens: A wide variety of substances can produce skin and lung hypersensitivity. Examples include diazomethane, chromium, nickel bichromates, formaldehyde, isocyanates, and certain phenols. Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity. Conduct aerosol producing procedures in a fume hood.

12.2. Special Precautions for Working with Embryotoxins

Embryotoxins: Substances that act during pregnancy to cause adverse effects on the fetus. These effects include embryolethality (death of the fertilized egg, the embryo, or the fetus), malformation (teratologic effects), retard growth, and postnatal functional deficits. Examples include organomercurials, lead compounds, and formamide. Because the period of greatest susceptibility to embryotoxins is the first 8-12 weeks of pregnancy, which includes a period when a woman may not know she is pregnant, women of child-bearing potential should take care to avoid skin contact with all chemicals.

(a) Review each use of embryotoxins with the research supervisor, the Chemical Hygiene Officer. Review continuing uses annually or whenever a procedural change is made.
(b) Label containers as follows:
EMBRYOTOXIN: READ SPECIFIC PROCEDURES FOR USE.
(c) Store embryotoxins in unbreakable containers or unbreakable secondary containers in a well ventilated area.
(d) Guard against spills and splashes. Appropriate safety apparel, especially gloves, should be worn. All hoods, glove boxes, or other essential engineering controls should be known to be operating properly before work is started.
(e) Notify your supervisor or the Chemical Hygiene Officer of all incidents of exposure or spills. The Supervisor or Chemical Hygiene Officer will arrange for a medical consultation if necessary.

12.3. Special Precautions for Working with Chemicals of Moderate, Chronic, or High Acute Toxicity

Examples (list is not all inclusive) include diisopropylfluorophosphate, hydrofluoric acid, and hydrogen cyanide.

(a) Consult one of the standard compilations that list toxic properties of known substances and learn what is known about the substance that will be used. Follow the specific precautions and procedures for the chemical.
(b) Use and store these substances only in designated (restricted access) areas placarded with appropriate warning signs.

(c) Use a hood or other containment device for procedures which may result in the generation of aerosols or vapors; trap released vapors to prevent their discharge with fume hood exhaust.
(d) Avoid skin contact by use of gloves and long sleeves and other protective apparel as appropriate.
(e) Maintain records of the amounts of materials on hand, amounts used, and the names of the workers involved.
(f) Be prepared for accidents and spills. Assure that at least 2 people are present at all times if the compound in use is highly toxic or of unknown toxicity.
(g) Store breakable containers in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper.
(h) If a major spill occurs outside the hood, evacuate the area and call for assistance.
(i) Thoroughly decontaminate or dispose of contaminated clothing or shoes. If possible, chemically decontaminate by chemical conversion to a less toxic product.
(j) Store contaminated waste in closed, suitably labeled, impervious containers.

12.4. Special Precautions for Working with Chemicals of High Chronic Toxicity (i.e. Carcinogens)

Examples (list is not all inclusive) include dimethylmercury, nickel carbonyl, benzo-a-pyrene, N-nitrosodiethylamine, other human carcinogens or substances, for which all persons with access are aware of the substances being used and necessary precautions.

(a) Conduct all transfers and work in designated (restricted access) areas: a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances. Assure that all persons with access are aware of the substances being used and necessary precautions.
(b) Protect vacuum pumps against contamination with scrubbers or HEPA filters and vent effluent into the hood.
(c) Decontaminate vacuum pumps or other contaminated equipment, including glassware, before removing them from the designated area. Decontaminate the designated area before normal work is resumed.
(d) On leaving the designated area, remove protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck.
(e) Use a wet mop or a vacuum cleaner equipped with a HEPA filter to decontaminate surfaces. DO NOT DRY SWEEP SPILLED POWDERS.
(f) If using toxicologically significant quantities of a substance on a regular basis (in quantities above a few milligrams to a few grams, depending on the substance, 3 or more times per week), contact the Chemical Hygiene Officer.
(g) Keep accurate records of the amounts of these substances stored and used, the dates of use, and names of users.
(h) Assure that the designated area is conspicuously marked with warning and restricted access signs and that all containers are appropriately labeled with identity and warning labels (e.g., CANCER-SUSPECT AGENT).
(i) Assure that contingency plans, equipment and materials to minimize exposures of people and property in case of accident are available.
(j) For a negative pressure glove box, ventilation rate must be at least 2 volume changes/hour and at a pressure of at least 0.5 inches of water gauge. For a positive pressure glove box, thoroughly test for leaks before each use. In either case, trap the exit gases or filter them through a HEPA filter and then

release them into a fume hood.
(k) Use chemical decontamination whenever possible; ensure that containers of contaminated waste are transferred from the designated area under the supervision of authorized personnel.

12.5. Radioactive Material Hazards

Use of radioactive materials at the EPD Laboratory is strictly controlled. Contact the Department's Radioactive Materials Program if you are planning on using radioactive materials.

13. EMERGENCY RESPONSE

Plan in advance for an emergency. What possible emergencies could occur during your work, e.g., fire, spill, high-level chemical exposure? Are systems available to indicate an emergency situation, e.g., chemical exposure monitoring systems? What supplies and equipment should be maintained in the area to assist emergency response personnel in the event of an emergency, e.g., eyewash and safety shower, spill control materials, personal protective clothing? What training is required to handle an emergency in the area, e.g., emergency first aid or respirator use training? Is it safe for you to work alone?
Evaluate the work area for the following:

- Chemical monitoring systems.
- Supplies and equipment required to assist emergency response personnel in emergency activities.
- Eyewash.
- Safety shower.
- Spill control materials.
- Personal protective clothing.

Also consider whether planned work activities are safe to conduct alone. Check to see that all personnel have received emergency training e.g. emergency first aid, respirator use training, etc.

14. ENGINEERING CONTROLS

Exposure to hazardous materials should be controlled to the greatest extent feasible by use of engineering controls. For assistance in determining engineering controls necessary for your work situation, contact the Chemical Hygiene Officer or your Supervisor. Engineering controls to reduce or eliminate exposures to hazardous chemicals include:

14.1. Substitution of less hazardous equipment, chemicals or processes (e.g., safety cans for glass bottles).
14.2. Isolation of the operator or the process (e.g., use of barriers when handling explosives, or completely enclosing the process in a glove box or other enclosure).
14.3. Local and general exhaust ventilation (e.g., use of fume hoods).

15. VENTILATION CONTROLS

15.1. General Laboratory Ventilation

The four air handling systems in the EPD Laboratory provide a source of air for breathing and for input to local ventilation devices. General ventilation must not be relied on for protection from toxic substances released into the laboratory. General ventilation ensures that laboratory air is continually replaced, preventing increased air concentrations of toxic substances during the work day. Air flow should not be turbulent and should be relatively uniform throughout the laboratory with no high velocity or static areas.

Check the MSDS to determine ventilation requirements. Expressions on an MSDS such as those listed below indicate a need for local ventilation:

*use with adequate ventilation
*use in a fume hood
*avoid vapor inhalation
*provide local exhaust ventilation

Ventilation recommendations must be adapted to the worksite and the specific process. Contact the Chemical Hygiene Officer or your Supervisor for assistance in determining specific ventilation requirements for your work situation.

15.2. Proper Use of Ventilation Systems

The function of a laboratory hood is to capture and retain the atmospheric contaminant generated. A hood is not designed to capture airborne contaminants elsewhere in the laboratory, nor is the hood intended to contain explosions. The successful operation of a hood depends primarily on the velocity of the air moving through it. Factors that affect the face velocity and movement of air through the hood are cross-currents, entrance shape, exhaust slot design, and obstructions. Good hood operations may also depend on its ability to confine a fire, withstand corrosion, and to be easily cleaned if contaminated. The lab hoods used by EPD Laboratory should be appropriate for use with flammable liquids, and must be constructed of materials that will withstand fire for several minutes so that the hood enclosure can maintain its integrity and confine the fire until it can be extinguished.

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a PEL or TLV of less than 50 ppm. Never do work with hazardous materials if the required ventilation system is not working. The laboratory should test and certify all fume hoods annually. In addition all local ventilation systems have been equipped with gauges to indicate operating status. If there are any questions concerning the adequacy of a fume hood or the procedures for safe use of a fume hood, contact your Supervisor or the Chemical Hygiene Officer.

General laboratory ventilation requires 4 to 12 room air changes per hour, if local exhaust systems (e.g., lab hoods) are used as the primary means of control. The velocity of air entering a hood at its face (opening) determines whether the hood is safe, because an adequate face velocity is necessary

for the control and capture of contaminants in the hood. The minimum face velocity a laboratory hood should have is 100 linear feet per minute (or 30 m/min). However, a face velocity of 100 fpm will not be adequate to capture contaminants released with great force. Higher capture velocities for lab hoods can be achieved by closing the sash or positioning bench shields to reduce the open face area.

Cross currents outside a hood can nullify or divert air flow into a hood and reduce its velocity. Therefore, it is important to locate hoods away from doors, windows, and air conditioning or heating outlets. Pedestrian traffic past a hood should be limited because a walking rate of 1 mile per hour causes a cross current velocity of 88 feet per minute; at 2 mph, cross current velocity reaches 176 fpm. At these cross current velocities, vapor contaminants near the front of the hood are drawn out by a passer-by.

15.3. Laboratory Fume Hood Operating Procedures

(a) Define the hazard level of the proposed work and locate a hood that meets the respective standard.

Hazard Level	Required Face Velocity (fpm)
low toxicity	60-80
moderate toxicity of odorous vapors	80-100
highly toxic, including carcinogens	100-125
radioactive materials	100-125

(b) Visually check the gauge to verify that the system is operational.
(c) Clear the hood deck.
    (1) When appropriate line the deck with plastic backed absorbent paper taking care not to block air foils.
(d) Locate work at least 6 inches inside the sash and center relative to the hood sides. Set up equipment/apparatus to allow maximum flow of air across the deck surface. It may be necessary to elevate large pieces of equipment on blocks to allow air to flow under the equipment.
(e) To achieve maximum entrainment of room air and to increase the capture capacity of the hood:
    (1) Close windows and doors.
    (2) Limit pedestrian traffic in the hood area.
    (3) Limit operator body movement.
    (4) Lower the hood sash to the operating level.
(f) A fume hood is to be used in conjunction with the appropriate personal protective equipment.
(g) Report unsatisfactory fume hoods to your Supervisor.

15.4. Laboratory Fume Hood Evaluation

Every year, the Chemical Hygiene Officer or Lab Manager should check each hood to determine if functioning properly.

(a) Check condition of the hood
    (1) Check blockage of slots, leaks, obstruction of ducts, condition of fan
(b) Check capture effectiveness
    (1) Use smoke candle (or similar device) to determine if smoke is captured, retained and exhausted to roof
    (2) Use anemometer (air velocity meter) to measure velocity quantitatively (set fan switch at 125 fpm)
        a) At center location inside hood, sash raised
        b) At center location inside hood, sash lowered (must be >100 fpm)
        c) At front left, right sides of hood
        d) At front center of hood, sash lowered until >100 fpm reached: working sash level

16. PERSONAL PROTECTIVE EQUIPMENT

16.1. Eye and Face Protection

Suitable eye protection must be worn at all times in designated areas by laboratory personnel or visitors who enter the laboratory. The design and construction of the eye protection must be in accordance with the American National Standards for Occupational and Educational Eye and Face Protection, Z87.1. Protectors shall meet the following requirements:

(a) They shall provide adequate protection against the particular hazards for which they are designed.
(b) They shall be reasonably comfortable when worn under the designated conditions.
(c) They shall fit snugly and shall not unduly interfere with the movements of the wearer.
(d) They shall be durable.
(e) They shall be capable of being disinfected.
(f) They shall be easily cleanable.

Personnel whose vision requires the use of corrective lenses in spectacles will be provided with spectacles whose protective lenses provide optical correction. Visitors will be provided with goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles. Contact lenses cannot be worn in the laboratory in designated areas.

Explosions and implosions are major causes of serious eye injuries in laboratories. Vacuum vessels should be operated in a laboratory hood with the hood sash completely closed. Operations involving the potential of acid or alkali splashing or the release of irritating fumes shall be performed in a laboratory hood, if possible. Individuals handling these chemicals must wear, as a minimum, flexible fitting hooded ventilation plastic goggles (i.e., chemical splash goggles).

16.2. Protective Clothing

No standards have yet been established for the selection of chemically resistant clothing. Therefore, the selection of garments for a particular laboratory task requires good judgment. Laboratory coats made of cotton or rayon are used for most laboratory operations, however, these fabrics are easily degraded (see table16-1 below). Polyethylene aprons provide adequate resistance to most chemicals, however, they tend to tear and puncture easily. The Chemical Hygiene Officer or Lab Manager should evaluate whether clothing worn provides adequate protection for the application being done.

Table 16-1: Weaknesses of Clothing Fibers

Fiber	Weakness
Cotton, Rayon	Degraded by alkalis, Fair durability, Needs dry cleaning, Many chemicals not removed when cleaned
Wool	Degraded by acids, Fair durability, Many chemicals not removed when washed
Nylon, Orlon, Dacron	Static build-up, Melts when heated, Requires flame retardant, High heat transfer
Polyethylene, Polypropylene	Static build-up, Requires flame retardant, Not very durable

16.3. Gloves

Gloves must be worn when working with chemicals. The selection of material for the gloves should be based on its resistance to chemical degradation and on its ability to resist permeation. Consult table 16-2 below for chemical resistances of specific materials. Natural latex, neoprene, nitrile, butyl rubber, and polyvinyl are commonly used materials for glove fabrication and each provides optimum protection for certain classes of compounds.

Other general rules about the use of gloves include:

(a) Gloves should be inspected regularly for discoloration, punctures, and tears.
(b) Gloves should be carefully removed to avoid skin contamination.
(c) Gloves should be replaced periodically, depending on the frequency of use and permeability to substances handled.
(d) Insulated gloves should be used when handling hot or cold objects.
(e) Specialized gloves are available for specific jobs. Information can be obtained from glove manufacturers.

Table 16-2: Chemical Protection of Glove Materials by Chemical Class

Key: E=Excellent, G=Good, F=Fair, P=Poor Chemical Class — Glove Material	Butyl Rubber	Polyvinyl Chloride	Neoprene	Natural Latex
Alcohols	E	E	E	E
Aldehydes	E-G	G-F	E-G	E-F
Amines	E-F	G-F	E-G	G-F
Esters	G-F	P	G	F-P
Fuels	F-P	G-P	E-G	F-P
Halogenated Hydrocarbons	G-P	G-P	G-F	F-P
Hydrocarbons	F-P	F	G-F	F-P
Inorganic Acids	G-F	E	E-G	F-P
Inorganic Bases & Salts	E	E	E	E
Ketones	E	P	G-F	E-F
Natural Fats & Oils	G-F	G	E-G	G-F
Organic Acids	E	E	E	E

16.4. Respirators

Respirators should be used in emergencies or where the use of respirators is required to maintain exposure below the PEL. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.

17. ADMINISTRATIVE CONTROLS

17.1. General administrative controls are procedural measures which should be taken to reduce or eliminate hazards associated with the use of hazardous materials. Administrative controls include the following:

(a) Careful planning of experiments and procedures with safety in mind. Planning includes the development of written work procedures for safe performance of the work.
(b) Restricting access to areas in which hazardous materials are used.
(c) Using signs or placards to identify hazardous areas (designated areas).
(d) Use of labels on hazardous materials.
(e) Substitution of less toxic materials for toxic materials.

(f) Good housekeeping.
(g) Good hygiene (e.g., washing hands and other areas of possible chemical contact).
(h) Prohibiting eating, drinking, and smoking in areas of chemical/biological use, and providing break areas for this purpose.
(i) No mouth pipetting.
(j) Adding acid to water, never water to acid.
(k) Assuring employees are provided adequate training for safe work with hazardous materials.
(l) Food items may not be stored in laboratory areas or laboratory refrigerators at any time.

17.2. Restricted/Designated Areas

(a) Facilities placarded with the following warning signs are restricted access, designated areas:
*CAUTION - BIOHAZARDS
*CAUTION - HIGH RADIATION AREA
*CAUTION - HIGHLY ACUTE TOXICITY
*CAUTION - LASER
*CAUTION - RADIATION AREA
*CAUTION - RADIOACTIVE MATERIAL
*CAUTION - REPRODUCTIVE TOXIN
*CAUTION - X-RAY

(b) A list with names and phone numbers of responsible personnel should be posted on the door(s) to any restricted access, designated areas.
(c) Staff should not enter a restricted area, except when accompanied by an authorized user of the facility.
(d) In general, all support personnel must have a minimal level of training to enter any laboratory. Additional awareness training must be given by the Chemical Hygiene Officer or the Supervisor for support personnel to enter restricted areas.
(e) Custodians are permitted to enter restricted areas to perform routine tasks; however, custodians should not touch labeled waste containers, other research equipment or materials.
(f) Other support personnel, such as Police, are permitted to enter restricted areas provided the work to be performed does not involve disturbing a use area within the facility, equipment, or materials. Examples include: fume hoods, biological safety cabinets, sinks, placarded equipment, chemicals or materials on lab benches

18. EXPOSURE EVALUATIONS

An exposure evaluation will be conducted for employees who, as a consequence of a laboratory operation, procedure, or activity, reasonably suspect or believe they have sustained an overexposure to a toxic substance. The exposure evaluation will be conducted by the Chemical Hygiene Officer under the direction of the Department Training Coordinator.

18.1. Initial Monitoring - If there is reason to believe that exposure levels exceed the PEL or action

level for a regulated substance, the employee's exposure will be measured.

18.2. Periodic Monitoring - If initial monitoring indicates employee exposure above the PEL or action level, the monitoring provisions of the Chemical Hygiene Plan will be implemented.

18.3. Termination of Monitoring - The employer may terminate monitoring in accordance with the relevant standard.

18.4. The employee must be notified of the result of the monitoring within 30 days of the employer's receipt of the results.

19. MEDICAL SURVEILLANCE

19.1. Each Laboratory Technician, Scientist, Associate and Manager who work with hazardous chemicals shall be provided an opportunity to receive medical attention under the following circumstances:

(a) An initial and exit medical screening at the beginning and end of employment with the laboratory.
(b) Those staff who are directly in contact with hazardous chemicals (that can produce acute or chronic health effects) should be monitored once every three years if under the age of 45 and annually at the age of 45 and above.
(c) When the employee develops signs and/or symptoms that may be associated with a hazardous chemical to which the employee was exposed in the laboratory;
(d) When routine monitoring reveals an exposure above the PEL or action level;
(e) When an event takes place in the work area such as a spill or leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure.

19.2. All medical examinations and consultations shall be performed by a licensed physician or under his/her direct supervision. EPD Laboratory uses Occupational Medical Associates as the medical provider.

19.3. The employer shall provide the following information to the physician:
(a) The identity of the hazardous chemicals to which the employee may have been exposed;
(b) A description of the conditions under which the exposure occurred; and
(c) A description of the signs and symptoms of exposure the employee is experiencing, if any.

19.4. The Physician shall provide a written opinion which shall include:
(a) Any recommendation for further medical follow-up;
(b) The results of the 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; and
(d) A statement that the employee has been informed by the physician of the results of the

examination and any medical condition that may require further examination or treatment.
The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

19.5. All medical consultations shall be coordinated by the Department's Training Coordinator.

20. EMPLOYEE INFORMATION AND TRAINING

20.1. Employees shall be provided with information and training to ensure that they are appraised of the hazards of chemicals in their work area.

20.2. 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.
20.3. Information - Employees Shall be Informed of:

(a) The contents of this Chemical Hygiene Plan;
(b) The location and availability of the Chemical Hygiene Plan;
(c) The PELs for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where PELs do not exist;
(d) Signs and symptoms associated with exposures to the hazardous chemicals used in the laboratory; and
(e) The location and availability of known reference materials such as MSDSs. See your Chemical Hygiene Officer or your Supervisor for additional information.

20.4. Training - Employee Training Shall Include:
(a) Methods and observations that may be used to detect the presence or release of a hazardous chemical;
(b) The physical and health hazards of chemicals in the work area;
(c) Measures employees can use to protect themselves from these hazards, including specific procedures such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

21. RECORDKEEPING

21.1. 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/or examinations including tests or written opinions required by this standard.

21.2. The employer shall assure that such records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

22. CHEMICAL WASTE MANAGEMENT GUIDELINES

22.1 Introduction

The following guidelines are to be used for the safe handling and disposal of Hazardous Chemical Waste. No Radioactive Material will be handled through this procedure. Consult the Radiation Safety Manual for the proper disposal of Radioactive Waste.

22.2 Chemical Waste Management

The responsibility for chemical waste identification, labeling, and packaging rests with the Lab Scientist or Associate. The supervisor should follow all of the procedures in the guidelines and provide proper instruction to personnel under their supervision.

When ordering chemicals, minimize volumes by purchasing the smallest quantity of a chemical consistent with protocol. Chemicals should be dated when received in a permanent and legible fashion. This procedure will aid in evaluating the hazard when a particular chemical becomes waste.

(a) Storage of Chemicals

(1) Chemicals should always be segregated according to compatibility and hazard class.
(2) Excess or outdated chemicals should not be allowed to accumulate in any location to a point that would create an unsafe working environment for laboratory personnel. NOTE: Before disposing of excess chemicals, determine if any other researcher has a need for them.
(3) Unknown chemicals cannot be disposed of until the compound has been properly identified. Personnel responsible for the area where unknowns are found are expected to identify these chemicals through communications and/or chemical analysis.
(4) Inventories of all chemicals in each laboratory should be conducted every twelve months. Check for damaged labels, outdated chemicals, damaged containers, peroxide forming compounds.

a.) Name
b.) Laboratory Name and Room #
c.) Quantities of solvents to be picked up

(5) Do not overfill container.
(6) Only mix compatible solvents.
(7) Segregate and store chemicals in the laboratory where generated for pick up according to hazard class and compatibility.

22.3 Chemical Disposal

The following procedures are to be used when disposing of chemical waste. Every person requesting a chemical waste pick up must complete a Chemical Waste Disposal Form. This form will provide information on the chemicals during storage. The Lab will arrange for a pick up chemical waste as generation volume requires.

(a) Single Chemical Containers

(1) Do not mix chemicals.

(2) Each chemical for disposal must be stored in individual, sealed containers. Only use containers made with materials, which are compatible with the chemicals to be stored. Example: Do not use a metal container to store a corrosive material.

(3) Complete all sections of the chemical waste label. Use a separate label for each container. NOTE:Chemicals without labels will not be picked up from the laboratory (see waste label).

(4) Complete a chemical waste disposal form.

(5) After material is properly labeled, packaged, and disposal form is filled out contact the Chemical Hygiene Officer.

(6) Segregate and store chemicals in the laboratory where generated for pick up according to hazard class and compatibility.

(b) Mixed Organic Solvents

(1) Labels for organic solvents should be obtained prior to starting a mixed solvent container (see waste label).

(2) Use 55 gallon drums for storage of mixed solvent waste. If glass bottles are used, a secondary containment system is required.

(3) List the name and volume of each solvent on the label at the time of addition.

(4) When the container is full, complete a chemical waste disposal form.

(c) Chemical Mixtures

The following guidelines are to be used when disposing of chemical mixtures which are generated as a result of chemical reactions, preparation of standards, etc.

(1) Containers used for storage of chemical mixtures must be properly labeled. It is important to list the name and percentage of each chemical constituent.

(2) Chemical mixtures for disposal must be stored in sealed containers. Only use containers made with materials, which are compatible with the chemical mixture to be stored. Example: Do not use a metal container to store a corrosive mixture.

(3) Complete a chemical waste disposal form.

(4) After material is properly labeled, packaged and disposal form is filled out, contact the Chemical Hygiene Officer.

(5) Do not overfill containers

(6) Do not combine mixtures.

(7) Segregate and store chemicals in the laboratory where generated for pick up according to hazard class and compatibility.

23. CHEMICAL SPILLS

23.1. General Information

(a) Anticipate spills by having the proper safety equipment on hand.

(b) Alert personnel in the area that a spill has occurred.

(c) Do what is necessary to protect life.
(d) The MSDS will contain special spill clean-up information, if applicable.
(e) Confine the spill if possible.
(f) If the spill is too large for you to handle; is a threat to personnel or the public; involves radioactive material; involves an infectious agent; or involves a corrosive, highly toxic, or reactive chemical, call for assistance.
(g) For specific spill clean-up information, contact your supervisor.

23.2. Low Hazard Material Spills

(a) No fire hazard; not particularly volatile, toxic or corrosive (e.g. salt solutions).
(b) Use an absorbent material that will neutralize the spill if available.
(1) trisodium phosphate
(2) sand
(3) sodium bicarbonate for acids
(4) powdered citric acid for bases
(5) "Oil-Dri", "Zorb-All", "Speedi-Dri", etc.
(6) paper towels
(c) A dustpan and brush should be used and rubber gloves and goggles should be worn.
(d) Decontaminate area with soap and water after clean-up.
(e) Place residue in a container for waste collection.
(f) Contact your supervisor or the Chemical Hygiene Officer for disposal information.

23.3. Volatile, Flammable, or Toxic Material Spills

(a) Notify all personnel in the area.
(b) Extinguish flames and all sources of ignition such as brush-type motors.
(c) Maintain fume hood ventilation.
(d) Vacate the area and call for assistance.
(e) The following compounds are very hazardous. You should not clean them up yourself.
aromatic amines, bromine, carbon disulfide, cyanides
ethers, hydrazine, nitriles, nitro compounds, organic halides
(f) If you spill a highly toxic material, immediately contact the Chemical Hygiene Officer and your supervisor.

23.4. Acid Chloride Spills

(a) Absorb spill with "Oil-Dri", "Zorb-All", "Speedi-Dri" or other clay type absorbent.
(b) Avoid contact with skin.
(c) Place residue in container for waste collection.
(d) For specific clean-up information, contact your supervisor.

23.5. Mercury Spills

(a) Use a trapped vacuum line attached to a tapered glass tube similar to a medicine dropper to pick

up mercury droplets.
(b) Do not use a domestic or commercial vacuum cleaner.
(c) Cover small droplets in accessible areas with one of the following:
(1) Decontaminate surfaces after mercury spills with mercury sponges or mercury absorb powder. These spill kits are available through Lab Safety Supply and Baker Chemical Supply.
(2) Powdered sulfur
(3) Silver metal compounds
(d) Place residue in container for waste collection.
(e) For specific clean-up information, contact your supervisor.

23.6. Alkali Metal Spills
(a) Smother with powdered graphite or "Met-L-X."
(b) Call for assistance.
(c) For specific clean-up information, contact your supervisor.

23.7. White Phosphorus

(a) Smother with wet sand or wet absorbent.
(b) Call for assistance.
(c) For specific clean-up information, contact your supervisor.

24. INJURY, ILLNESS, PERSONAL CONTAMINATION, MINOR FIRST AID

24.1. Injury and Illness

(a) Employees and students must notify their immediate supervisor of all illnesses and injuries related to exposure to hazardous chemicals.
(b) Employees should report to a Workers' Compensation Board approved doctor if medical attention is required. Employees should be accompanied by a supervisor. In emergency situations, Piedmont or Grady Hospitals should be used.
(c) If transportation is necessary, an ambulance service (9-911) should be called to transport the victim.
(d) Do not move a seriously injured person unless they are in further danger.
(e) In cases of serious injury or illness, it is imperative appropriate actions be followed immediately.
(f) When in doubt as to what should be done, telephone the Fulton County Emergency Services (9-911) for assistance.
(g) Tell emergency and medical personnel:
(1) your name, location and nature of the emergency
(2) name of the chemical involved
(3) the amount involved
(4) area of the body affected

(5) symptoms

(h) If you have any questions regarding injury and illness procedures, contact your supervisor or the Chemical Hygiene Officer.

24.2. Personal Contamination

(a) General Information

(1) Do what is necessary to protect life. Remain calm.
(2) The MSDS will contain special first aid information.
(3) Do not move an injured person unless they are in further danger.
(4) A blanket should be used immediately to protect the victim from shock and exposure.
(5) Get medical attention promptly by dialing: 9-911
(6) For specific instruction regarding personal contamination, contact your supervisor or the Chemical Hygiene Officer.

(b) Chemicals Spilled Over a Large Area of the Body

(1) Quickly remove all contaminated clothing while using the safety shower or other available source of water.
(2) Immediately flood the affected body area in cold water for at least 15 minutes.
(3) Wash off chemical with water but do not use neutralizing chemicals, unguents, creams, lotions, or salves.
(4) Get medical attention promptly.

(c) Chemicals on the Skin in Confined Areas

(1) Immediately flush with cold water.
(2) If there is no visible burn, remove jewelry to facilitate removal of any residual material and scrub area with warm water and soap, removing any jewelry to facilitate removal of any residual material.
(3). If a delayed action is noted (often the next day), report immediately for medical attention and explain carefully what chemicals were involved.
(4) If the incident involves hydrofluoric acid (HF), seek immediate medical attention.
(5) If there is any doubt, seek immediate medical attention.

(d) Chemicals in the Eyes

(1) Irrigate with plenty of cool water for at least 15 minutes. Use eyewash or other water source.
(2) Simultaneously check for and remove contact lenses.
(3) Get medical attention promptly.

(e) Smoke and Fumes

(1) Anyone overcome with smoke or chemical fumes should be removed to uncontaminated air and treated for shock.
(2) Do not enter the area if a life threatening condition still exists:
    a) oxygen depletion
    b) explosive vapors

c) cyanide gas, hydrogen sulfide, nitrogen oxides, carbon monoxide

(3) If certified, follow standard CPR protocols.

(4) Get medical attention promptly.

(f) Burning Chemicals on Clothing

(1) Extinguish burning clothing by using the drop-and-roll technique or by dousing with cold water or use emergency shower.

(2) Remove contaminated clothing; however, avoid further damage to the burned area. If possible, send clothing with the victim.

(3) Remove heat with cool water or ice packs until tissue around burn feels normal to the touch.

(4) Cover injured person to prevent shock.

(5) Get medical attention promptly.

(g) Ingestion of Hazardous Chemicals

(1) Identify the chemical ingested.

(2) Call for an ambulance (9-911).

(3) Call the Poison Information Center (9-404-616-9000).

(4) Cover injured person to prevent shock.

(5) Provide the ambulance crew and physician with the chemical name and any other relevant information. If possible, send the container or the label with the victim.

24.3. Minor First Aid

(a) First Aid Kits

(1) Each laboratory should have a first aid kit for treatment of minor first aid cases (cuts, scratches, minor burns).

(2) First aid kits must be readily accessible. If the kit is not visible, the area where it is stored must be clearly marked.

(3) First aid kits must be fully stocked at all times.

(4) Do not dispense or administer any medications, including aspirin.

(5) Do not put any ointments or creams on wounds or burns. Use ice, cold pack or cold water.

(6) The MSDS contains special first aid information.

(7) After giving first aid, direct or transport the victim to a medial facility for evaluation.

25. INCIDENT INVESTIGATION REPORT

In the event of a laboratory accident, managers are to begin an investigation of what occured. The following form should be used to assist the interviewing of people involved in the incident.

Laboratory Incident Report Form

This report is to assist you in recalling the events leading up to a laboratory accident and what happened immediately afterwards. Please note any details that you can remember.

Your Name: _____

Date of Report: _____

Date/Time of Accident: _____

Location/Room: _____

Location inside Room where accident happened: _____

Where were you at the time? _____

What were you doing? _____

Describe what you observed: _____

What did you do afterwards? _____

Any other remarks? _____

(continue on reverse, if needed) Signed: _____

26. CHEMICALS USED WITHIN THE LABORATORY

26.1. Air Laboratory
Acetone
Ammonium Hydroxide
Barium Chloride
Barium Perchlorate
Bromine
Chloroform
Citronellal
Contrad 70 (Potassium Hydroxide)
Electrode Storage Solution (Potassium Hydrogen Phthalate, Potassium Chloride)
Ethyl Alcohol
Ethyl Ether
Hydrochloric Acid
Hydrogen Peroxide
Label-Off (Mineral Spirits)
Lead Reference Standard Solution
Mercury
Methyl Orange
Nitric Acid
pH Buffer Solutions (4,7,10)
Phenol
Phenolphthalein
Potassium Chloride
Potassium Hydrogen Phthalate
Potassium Hydroxide
Potassium Nitrate
2-Propanol
Propionaldehyde
Silica Gel
Silicone
Silver Nitrate
Sodium Perchlorate
Sodium Hydroxide
Sulfuric Acid
Thorin
Toluene
Un-du Adhesive Remover (Hydrotreated Light Distillate Aliphatic Petroleum Naptha)
p-Xylene

26.2. Bacteriological Laboratory
Acetone
Alkaline Detergent #18 (Potassium Hydroxide)

Ammonium para-Molybdate
Analytab Oxidase Test Kit (N,N,N',N'-tetramethyl-p-phenylenediamine dihydrochloride, Ascorbic Acid)
API 20-E
Apiezon H Grease
Azide Dextrose Broth
Bactrol Disks
Cidex Formula 7 (Glutaraldehyde, 1,5-Pentanedial)
Colilert
Colisure (Proteose Peptone, Sodium Chloride, Sodium Phosphate, Ammonium Sulfate, Potassium Phosphate)
Crystal Violet (Ethanol, Methanol, Phenol)
N,N-Diethyl-p-Phenylenediamine (DPD #1)
Ethyl Alcohol
Ferric Chloride Spottest reagent
Glycerine
Gram Decolorizer (Acetone, Isopropyl alcohol)
Iodine
Kilit Ampules (Bacillus Stearothermophilus)
M Coliblue Broth
M Enterococcus Agar
M Endo Agar LES
M Enterococcus
Magnesium Chloride Hexahydrate
Mercury
Methyl Alcohol
Mineral Oil
Nalgene L900 liquid detergent
Nitric Acid
pH Buffer 7.0
Phosphoric Acid
The Pill (Unipine, Terpineol, Orange Oil, Nonyl Acetate, Lemon Grass Oil, Diphenyl Oxide, Aldehyde C-10)
Rosolic Acid
Silver Nitrate
Sodium Chloride solution
Sodium Hydroxide
Sodium Hypochlorite solution (bleach)
Sodium Phosphate, Dibasic
Sodium Phosphate Monobasic
Sodium Thiosulfate Pentahydrate
Sparkle Jet detergent
Sparkleen I detergent
Tris (hydroxymethyl) aminomethane
Voges-Proskauer Spottest reagent

26.3. GC/MS Laboratory
Acenaphthene
Acenaphthylene
Acetic Acid
Acetone
Acetonitrile
Acetophenone
Acrolein
Acrylamide
Acrylonitrile
Aldrin
Allyl Alcohol
Aniline
Anthracene
Arochlor 1016
Arochlor 1221
Arochlor 1232
Arochlor 1242
Arochlor 1248
Arochlor 1260
Aviation Fuel (Jet-A) Standards
Benzene
Benzidiene
Benzo(a)anthracene
Benzo(b)fluroanthene
Benzo(k)fluroanthene
Benzo(a)pyrene
Benzo(g,h,i)perylene
Benzoic acid
Benzyl alcohol
Benzyl chloride
a-Benzene Hexachloride
b-Benzene Hexachloride
d-Benzene Hexachloride
g-Benzene Hexachloride
bis(2-chloroethoxy) methane
bis(2-chloroethyl) ether
bis(2-chloroisopropyl) ether
bis(2-ethylhexyl) adipate
bis(2-ethylhexyl) phthalate
Bromobenzene
Bromochloromethane
Bromochloromethane-d2
2-Bromo-1-chloroproane-d6

4-Bromofluorobenzene
Bromoform
Bromomethane
Butyl benzyl phthalate
Carbon disulfide
Carbon tetrachloride
4-Chloroaniline
Chlorobenzene
Chlorobenzilate
p-Chloro-m-cresol
Chlorodibromomethane
Chloroethane
2-Chloroethyl vinyl ether
Chloroform
1-Chloro-2-fluorobenzene
2-Chloronaphthalene
4-Chlorodiphenyl ether
2-Chlorophenol
3-Chlorophenol
4-Chlorophenol
3-Chloropropionitrile
2-Chlorotoluene
4-Chlorotoluene
Chyrsene
2-Cresol
3-Cresol
4-Cresol
Cyclohexanol
Cyclohexanone
Decafluorotriphenylphosphine
4,4'-DDD
4,4'-DDE
4,4'-DDT
2,4-Diaminotoluene
Dibenzo(a,h)anthracene
Dibenzofuran
Dibromochloromethane
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane
Dibromomethane
Dibutyl ether
4,4'-Dibromooctafluorobiphenyl
1,2-Dichlorobenzene
1,2-Dichlorobenzene-d4
1,3-Dichlorobenzene

1,4-Dichlorobenzene
3,3'-Dichlorobenzidine Dihydrochloride
Dichlorobromoethane
cis-1,2-Dichloroethylene
1,4-Dichlorobutane-d8
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
cis-1,2-Dichloroethylene
trans-1,2-Dichloroethylene
Dichlorodifluoromethane
2,4-Dichlorophenol
2,6-Dichlorophenol
1,2-Dichloroethane
1,2-Dichloropropane
1,3-Dichloropropane
2,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
1,1-Dichloro-1-propene
2,3-Dichloropropylene
1,3-Dichloropropylene (cis-, trans- isomers)
2,4-Dichlorotoluene
p-Chlorotoluene
Dieldrin
Diesel Fuel Standards
Diethyl ether
Diethyl phthalate
Diisodecyl Phthalate
7,12-Dimethylbenz(a)anthracene
Dimethyldichlorosilane
N,N-Dimethylforamide
2,4-Dimethylphenol-3,5,6-d3
Dimethyl phthalate
4,6-Dinitro-o-cresol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
p-Dioxane
Diphenylamine
Diphenyl ether
alpha-Endosulfan
beta-Endosulfan

Endosulfan Sulfate
Endrin
Endrin aldehyde
Epichlorohydrin
1,2-Epoxybutane
Ethyl Acetate
Ethylbenzene
Ethylenediamine
Ethylenethiourea
Ethylene Glycol
#2 Fuel Oil Standards
#3 Fuel Oil Standards
#4 Fuel Oil Standards
#6 Fuel Oil Standards
Fluroinert FC-43 (Perfluoro compounds C5-C18)
Fluoranthene
Fluorene
2-Fluoroactamide
Fluorobenzene
2-Fluorobiphenyl
1-Fluoronaphthalene
2-Fluorophenol
Fluorotrichloromethane
Gasoline Range Hydrocarbons Standards
Gasoline Standards
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
n-Hexane
Indeno(1,2,3-c,d)pyrene
Inland 19 (paraffinic oil)
Inland 45 (Synthetic Aliphatic Hydrocarbon)
Ion Exchange Resins
Isophorone
4-Isopropyltoluene
Isopropyl alcohol
JP-1 Jet Fuel Standards
JP-4 Jet Fuel Standards
Kerosene Standards
Malononitrile
Methanol
Methyl Bromide

Methyl Chloride
Methylene Chloride
1-Methylethylbenzene
Methyl Ethyl Ketone
Methyl Methacrylate
2-Methylnaphthalene
Methyl-tert-Butyl Ether
Naphthalene
2-Nitroaniline
3-Nitroaniline
4-Nitroaniline
Nitrobenzene
2-Nitrophenol
3-Nitrophenol
4-Nitrophenol
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Pentachlorobenzene
Pentachloronitrobenzene
Pentachlorophenol
Pentachlorophenol-13C6
n-Pentadecane
Phenacetin
Phenanthrene
Phenanthrene-d10
Phenol
Phenol-d5
Propyl Alcohol
Isopropyl Alcohol
Propionitrile
n-Propylbenzene
Pyrene
Pyridine
Resorcinol
Safrole
Styrene
1,2,3,4-Tetrachlorobenzene
1,2,4,5-Tetrachlorobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
alpha,alpha-2,6-Tetrachlorotoluene
Tetradecane

Tetrahydrofuran
Toluene
Toxaphene
2,4,6-Trichloroaniline
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,3,5-Trichlorobenzene
1,1,1-Trichloroethane
Trichloroethylene
2,3,5-Trichlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
1,2,3-Trichloropropane
n-Tridecane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
2,2,4-Trimethylpentane
Turbine Jet Fuel Standards
Vinyl Acetate
Vinyl Chloride
m-Xylene
o-Xylene
p-Xylene

26.4. Inorganics Laboratory
Acetic Acid
Acetone
Acetonitrile
Adsorber Resins (Amberlite)
Alconox
Alizarin Complex
Alkali Mixture (Sodium Hydroxide, Sodium Iodide, Sodium Azide)
4-Aminoantipyrine
Ammonium Chloride
Ammonium Hydroxide
Ammonium Molybdate
Ammonium Sulfate
Anion Mix or Standard
Antimony Potassium Tartrate, Trihydrate
Ascorbic Acid
Bio-Rex 70 (cation exchange resin)
Barium Chloride Dihydrate
BOD Nutrient Buffer Pillows
Boric Acid
Brij-35 (Surfactant)

Bromophenol Blue
Buffer, pH (4,7,10)
Cadmium
Carbon, Activated
Calcium Chloride
Chlorine (gas)
Chloramine-T Trihydrate
Choride 2 Indicator
Chloroform
Chromaver 3 Chromium Reagent
CuVer 1 Copper Reagent
Cupric Sulfate, 5-Hydrate
Cyanide Quality Control Sample (Potassium Cyanide)
Demand Quality Control Sample (Potassium Hydrogen Phthalate, L-Glutamic Acid)
Detergents (Alconox, Jet Clean, Liqui-Nox, Sparkleen, SparkleJet)
Dextrose, Anhydrous
Diethylamine
Digestion Solution COD (Sulfuric Acid, Mercuric Sulfate, Chromic Acid, Silver Sulfate)
Diphenyl Carbazone
1,5-Diphenylcarbohydrazide
s-Diphenylcarbazone
EDTA, Disodium salt Dihydrate or Tetrasodium salt (Ethylenediaminetetraacetic Acid)
Electrode Filling Solution (Potassium Chloride, Silver Chloride)
Electrode Storage Solution (Potassium Hydrogen Phthalate, Potassium Chloride)
Ethyl Acetate
Ethyl Alcohol
Ferric Nitrate, 9-Hydrate
FerroVer Iron Reagent (Sodium Thiosulfate, Sodium Metabisulfite, Sodium Hydrosulfite)
Fluoride Standard (Sodium Fluoride)
Freon-113 (1,1,2-Trichloro-1,2,2-Trifluorethane)
Hardness Buffer Solution (Aminomethylpropanol, Acetic Acid)
Hardness Indicator (Hydroxylamine Hydrochloride, Isopropanol, Calmagite, Propylene Glycol)
Hardness Titration Solution (Propylene Glycol)
Hexane
Hotplate (Refractory Ceramic Fibers aluminosilicate)
Hydranal Standard Sodium Tartrate
Hydranal Working Medium for Ketones (Chloroform, 2-Chloroethanol)
Hydranal Composite Ketones (Diethylene Glycol, Imidazole, Sulfur Dioxide, Iodine)
Hydrazine Sulfate
Hydroclhoric Acid
Hydrofluoric Acid
Hydrogen Peroxide
Hydroxylamine Hydrochloride
Hypophosphorus Acid
Lanthanum Nitrate Hexahydrate

Lauric Acid
Lead Carbonate
Leak Detector (Snoop)
M Endo Agar LES (basic fuchsin, sodium sulfite)
Magnesium Chloride, 6-Hydrate
Manganous Sulfate
Manganous Sulfate Monohydrate
Mercuric Nitrate Monohydrate
Mercuric Sulfate
Mercuric Thiocyanate
Mercury
Mercury Oxide
Methanol
Methylene Blue Solution
Methylthymol Blue

Micro Concentrated Cleaning Solution
Minerals Quality Control Sample
N-1-Naphthylethylenediamine Dihydrochloride
Nitrification Inhibitor
Nitric Acid
Nitrogen
Nutrients Quality Control Samples (Ammonium Chloride, Potassium Nitrate, Potassium Phosphate)
Oxygen
Pentachlorophenol
1,10-Phenanthroline Monohydrate
Phenol
Phenolics Quality Control Sample (Phenol, 2-Chlorophenol, 2,4-Dichlorophenol, 2,4-Dinitrophenol)
Phenolphthalein
Phosphoric Acid
Platinum Chloride
Polyseed (BOD Seed Inoculum)
Potassium Biiodate
Potassium Chloride
Potassium Cyanide
Potassium Dichromate
Potassium Hydrogen Phthalate
Potassium Ferricyanide
Potassium Hydroxide
Potassium Iodide
Potassium Nitrate
Potassium Permanganate
Potassium Persulfate
Potassium Phosphate Tribasic N-Hydrate
Potassium Phosphate Monobasic

Potassium Sodium Tartrate 4-Hydrate
Potassium Sulfate
Potassium Thiocyanate
1-Propanol
2-Propanol
Proprietary Solvent Anhydrous (denatured alcohols)
Pyridine
Salicylic Acid Sodium Salt
Silicone
Silver Sulfate
Silver Sulfate - Sulfuric Acid
Sodium Acetate Anhydrous
Sodium Borate Decahydrate
Sodium Carbonate Anhydrous
Sodium Dodecyl Sulfate
Sodium Hydroxide
Sodium Nitrite
Sodium Nitroferricyanide Dihydrate
Sodium Phosphate Dibasic Anhydrous
Sodium Phosphate Monobasic Monohydrate
Sodium Salicylate
Sodium Selenate Anhydrous
Sodium Sulfate Anhydrous
Sodium Sulfide
Sodium Sulfite Anhydrous
Sodium Thiosulfate Pentahydrate
Sulfamic Acid
Sulfuric Acid
Tannic Acid
t-Butanol
Tetrahydrofuran
Triton X-106 (Octylphenoxypolyethoxythanol)
o-Tolidine Dihydrochloride
Zinc Nitrate 6-Hydrate

26.5. Metals Laboratory
Acetic Acid
Aluminum (metals in Nitric Acid)
Ammonium Chloride
Analytes B (metals in Nitric Acid)
Antimony (metals in Nitric Acid)
Antimony (metals in Tartaric Acid)
Arsenic (metals in Nitric Acid)
Barium (metals in Nitric Acid)
Beryllium (metals in Nitric Acid)

Bismuth (metals in Nitric Acid)
Boron (metals in Boric Acid, Ammonium Hydroxide)
Cadmium (metals in Nitric Acid)
Calcium (metals in Nitric Acid)
Cerium (metals in Nitric Acid)
Chromium (metals in Nitric Acid)
CLP Primary Analytes (metals in Nitric Acid)
CLP Primary Interferents (metals in Nitric Acid)
Cobalt (metals in Nitric Acid)
Copper (metals in Nitric Acid)
Cupric Sulfate Anhydrous
N,N-Dimethylacetamide
Extracted Metals Pollutant Standard
Gallium (metals in Nitric Acid)
Germanium
Gold (metals in Hydrochloric Acid)
Hydrochloric Acid
Indium (metals in Nitric Acid)
Interference Check Standard (metals in Nitric Acid)
Interferents A (metals in Nitric Acid)
Iron (metals in Nitric Acid)
Kimwipes Lens Cleaning Solution (Isopropyl alcohol, 1,2-Propylene Glycol)
Lanthanum (metals in Nitric Acid)
Lead (metals in Nitric Acid)
Lithium (metals in Nitric Acid)
Lutetium (metals in Nitric Acid)
Magnesium (metals in Nitric Acid)
Manganese (metals in Nitric Acid)
Mass Calibration Matrix (metals in Nitric Acid)
Molybdenum (metals in Nitric Acid)
Neodymium (metals in Nitric Acid)
Nickel (metals in Nitric Acid)
Nitric Acid
Palladium Matrix Modifier (metals in Nitric Acid)
Potassium (metals in Nitric Acid)
Praseodymium (metals in Nitric Acid)
Primary Drinking Water (metals in Nitric Acid)
Quality Control Standard 7,19 (metals in Nitric Acid)
Riverine Water
Scandium (metals in Nitric Acid)
Selenium (metals in Nitric Acid)
Silver (metals in Nitric Acid)
Sodium (metals in Nitric Acid)
Strontium (metals in Nitric Acid)
TCLP Extraction Fluids 1,2

Thallium (metals in Nitric Acid)
Tin (metals in Nitric Acid)
Titanium (metals in Nitric Acid)
Vanadium (metals in Nitric Acid)
Yttrium (metals in Nitric Acid)
m-Xylene
Zinc (metals in Nitric Acid)
Zirconium (metals in Nitric Acid)

26.6. Organics Laboratory
Acetic Acid
Acetone
Acetonitrile
Ammonium Hydroxide
Antimony Pentachloride in Dichloromethane
Ascorbic Acid
Benzene
Calcium Hypochlorite
Carbon Disulfide
Chloroform
Cyclohexane
Cyclohexanol
Diethylamine
2,4-Dinitrophenylhydrazine
1,4-Dioxane
Ethyl Acetate
Ether Anhydrous
Ethylene Glycol
Florisil (Magnesia-Silica)
Formaldehyde
Fluoroglide CP (Fluoropolymer Resin, 1,1,1-Trichloroethane)
1-Heptanesulfonic Acid Sodium Salt
Hexane
1-Hexane Sulfonic Acid Sodium Salt
Hexadecane
Hexadecyltrimethylammonium Bromide
Hydrochloric Acid
Hydra-point Solvent G
Hydra-point Titrant
Hydrofluoric Acid
Iron
Methanol
n-Methyl-n-Nitroso-p-Toluenesulfonamide
Methyl-tert-Butyl Ether
Methylene Chloride

Monochloroacetic Acid
Nitric Acid
Octadecyl Bonded Silica Gel
Pentane
Petroleum Ether
Phenol
Phosphoric Acid
o-Phthaladehyde
Potassium Acetate
Potassium Hydroxide
Potassium Phosphate Dibasic
Potassim Phosphate Monobasic
1-Propanol
Propylene Glycol
Sodium Acetate
Sodium Bicarbonate
Sodium Borate 10-Hydrate
Sodium Borohydride
Sodium Chloride
Sodium Citrate
Sodium Fluoride
Sodium Hydroxide
Sodium Phosphate Dibasic
Sodium Salicylate
Sodium Sulfate
Sodium Sulfite
Sulfanilamide
Sulfuric Acid
TCLP Extraction Fluid 1
t-Butyl Alcohol
Tetrahydrofuran
Thiofluor

27. **FIRE PREVENTION AND SUPPRESSON PLAN**

1. Introduction

The EPD Laboratory located in Norcross has been designed to meet construction and fire prevention and suppression guidelines required by local and state agencies. This Plan meets the requirements of NFPA 45 6.6.3 for an emergency fire plan. The requirements of the plan enhance the safety characteristics of the building and also reduce the potential for property loss and business interruption as a result of a fire. Environmental testing laboratories have a high potential for small fire events. Large fires are a rare occurrence in laboratories. Staff members are encouraged to recognize laboratory conditions that may result in fire and take action to reduce fire potential or notify their laboratory Manager. Policies and procedures for reducing fire potential are included in this chapter of the EPD Laboratory Chemical Hygiene and Fire Prevention and Suppression Plan. Additional chemical handling and storage requirements are presented in other Chapters of the Chemical Hygiene Plan.

This plan provides instructions for laboratory staff during a fire emergency. Each staff member is required to be familiar with the requirements of the plan. Each laboratory section should review this plan one time per year. Laboratory Managers will document that each staff member has attended the initial plan training and annual refresher training.
Copies of attendance records will be maintained in each employee's file.

2. Management Responsibility

The fire prevention and suppression policy of the EPD Laboratory first ensures that procedures are in place to prevent fires and secondly, in the unlikely event of a fire, ensure all staff members understand the procedures for attempting to suppress the fire and if necessary vacate the laboratory in a safe manner. It is also a goal of this policy in the event of a fire to minimize property damage and to minimize the impact of a fire on laboratory production. The policy also provides for providing fire department responders with an up to date chemical inventory and quantities along with additional information to ensure the safety of the responders.

EPD Laboratory Management will provide and maintain the laboratory resources necessary for the staff to carry out their assignments in a safe environment. Management has also insured sufficient fire suppression infrastructure was included in the design and construction of the laboratory and that fire suppression infrastructure within the laboratory will be maintained at all times and inspected on an annual basis. Fire extinguishers in sufficient numbers and types appropriate for laboratory fires will be maintained and inspected on an annual basis. Documentation of maintenance and inspections will be retained in the Laboratory Director's office.

Additional Management Responsibilities include:

- Update and improvement of the fire prevention and suppression policy as necessary.
- Ensure the EPD Laboratory Chemical Hygiene and Fire Prevention and Suppression Plan is provided to each staff member.
- Ensure the policy and procedures of the plan are followed by all staff members.
- Review all laboratory fire prevention procedures and ensure existing and new staff members are trained in the policy and procedures.
- Ensure that staff concerns of unsafe working conditions with respect to fire and other hazards are addressed in an expeditious manner.
- Conduct annual training and review of fire prevention and suppression procedures and policy.
- Conduct annual fire safety drills.
- Ensure local fire departments are kept informed of hazardous chemicals that can impact responder safety. Update and provide chemical inventory as necessary.
- Ensure hazardous chemical storage areas are identified and appropriately marked.
- Establish and maintain laboratory evacuation plan including policy for avoiding interference with responding fire department personnel.
- Laboratory Director and Managers serve as the responsible personnel and are designated and trained to be liaison personnel for the fire department responders.

3. Staff Responsibility

Each EPD Laboratory staff member will be issued a controlled copy of the EPD Laboratory Chemical Hygiene and Fire Prevention and Suppression Plan. Staff members should review the plan requirements and become familiar with primary and secondary fire exit routes for evacuation of the laboratory. They should also locate and know how to operate the fire extinguishers located throughout their laboratory area.

- EPD Laboratory staff members are responsible for maintaining their copy of the EPD Laboratory Chemical Hygiene and Fire Prevention and Suppression Plan.
- Staff members are required to become familiar with and abide by the requirements of the plan.
- Notify laboratory Managers of unsafe working conditions with respect to fire and other hazards.
- Participation in annual training and fire drills.

4. Location of Fire Alarms and Emergency Equipment

If fire prevention efforts have failed and resulted in a fire the next step is to attempt to extinguish small fires with the appropriate fire extinguisher. Fire extinguishers are located throughout each laboratory department as well as the administrative areas. Fire extinguishers are available for

each type of fire that could occur in an environmental testing laboratory. Laboratory staff members are advised not to attempt to suppress a fire unless they have been trained in identifying fire classes and use of the appropriate type of fire extinguisher. Fire extinguishers at the EPD Laboratory include the following:

- Class ABC Multipurpose Dry Chemical: This type of extinguisher is applicable for many types of fires including class A, B, and C. Class ABC Multipurpose Dry Chemical fire extinguishers are effective on solvent and solid fuel fires. This type sprays a stream of ammonium dihydrogen phosphate that cuts off the oxygen supply and smothers the flame. This type of extinguisher is not recommended for laboratory instrumentation except in a last effort case because the dry chemical is a powder that is gritty and corrosive. It can permanently damage some sensitive instrumentation. Care must be exercised when using this fire extinguisher because the dry chemical spray can have sufficient force to break glassware and spread flammable solvent. It is recommended to use as little hand pressure on the extinguisher trigger as possible to prevent the breakage of glassware when attempting to smother a fire.

- Halon Fire Extinguisher: Halon fire extinguishers are located in instrumentation laboratories and in other areas where sensitive equipment is located. Halon extinguishers should be used with caution and only in a large room with sufficient ventilation. While Halon gas is an effective fire retardant, it decomposes into toxic the gases hydrogen fluoride and/or hydrogen chloride when heated. These extinguishers should be used immediately on a small instrumentation or equipment fire and should not be used to suppress an established fire where the dry chemical multipurpose extinguisher would be more effective.

- Automatic Sprinkler System: The EPD Laboratory is equipped with an automatic sprinkler system designed to thoroughly flood an area with water. Once this system is activated it cannot be turned off until authorized by the fire department responders. As would be expected, the sprinkler system will have a dramatic impact on laboratory instrumentation and equipment. For this reason, staff should attempt to suppress the fire when possible with one of the appropriate fire extinguishers.

5. Fire Suppression System Maintenance and Testing

Fire Extinguishers and the automatic sprinkler system are inspected and tested on an annual basis. The inspection program meets the requirements of NFPA. Documentation of the inspection and maintenance is available in the Laboratory Director’s office. This is done under a contract the property management company has with an independent testing and maintenance company. Fire extinguisher expiration dates are monitored as part of the quarterly health and safety inspections conducted by Laboratory Managers or their designee.

Fire Alarms, including smoke, fire and heat detectors are also inspected and tested on an annual basis. Documentation of the testing is maintained in the Laboratory Director’s office.

6. Flammable Chemicals

As in all cases of fire, laboratory fires require three specific conditions or elements:

- Fuel such as a flammable liquid or solid
- A source of Oxygen from air or chemical oxidizer
- An ignition source of sufficient energy

These conditions together will not always result in a fire. Each must be introduced into the mixture in the correct ratio. Flammable liquids must be present within a specific range called the flammable range or explosive limit. The explosive limits are presented as a Lower Explosive Limit, below which the fuel/air mixture is too lean and will not ignite and a the Upper Explosive Limit at which above the fuel/air mixture is too rich and will not ignite.

Flammable liquids are also characterized by their ignitability or flash point. The ignitability point is the lowest temperature that sufficient vapor from the flammable liquid is capable of creating an ignitable condition. Laboratory solvents with flash points at or below ambient room temperature are especially prone to creating an ignitable mixture with air. Often laboratory solvents are heated during an analytical method well above these temperatures, increasing the likelihood of ignition and fire. Common laboratory solvents with flash points in this range at the EPD Laboratory include:

- Acetone: -18°C
- Hexane: -7°C
- Pentane: -40°C
- Acetonitrile: 2°C
- Ethyl Ether: -45°C
- Petroleum Ether: -18°C
- Methanol: 11°C
- Isooctane: 4.5°C
- MTBE: -10°C
- Ethyl Acetate: -4°C

Additionally, a chemical inventory of all chemicals present at the EPD Laboratory is available in the Quality Assurance Manager's office. This inventory provides information concerning the amount of the chemical present in the laboratory along with health, flammability, and reactivity rating for each chemical. MSDS sheets for each chemical are also maintained in the laboratory of use in the EPD Laboratory. A Right to Know handbook has been issued to every staff member and laboratory management encourages every staff member to review the MSDS for all chemicals used during their assigned analytical methods.

7. Common Causes of Fires and Additional Fire Prevention Guidelines

Most laboratory fires are the result of flammable solvents and vapors coming into contact with hot plates or other electrical devices. Flammable solvents have a tendency to flash boil and boil over onto hot equipment and counters. This can result in flammable vapors migrating several feet from the source and coming into contact with electric thermo switches or other electrical switches. When the switch cycles, an electric spark ignites the solvent resulting in a flash fire. This type of fire may exceed the vacuum capacity of the fume hood and expand outside of the hood, endangering people in close proximity to the fume hood. Always work in a fume hood and using the mildest heat source necessary for condensing the solvent volume can prevent this type of fire. A cold or ambient temperature solvent should never be immersed directly into boiling water. The water bath temperature should be raised from ambient with the glassware immersed or the solvent should be brought to the boiling point by suspending the glassware above the hot water before slowing lowering the glassware into the hot water. Sample concentration equipment should be inspected by supervisors to ensure the temperature of the water has not been raised over time to speed up the concentration time. Use of other laboratory sample concentration instruments such as the Turbovap or Rapidvap greatly reduce the fire potential.

Diazomethane should be treated with extreme caution. Only senior laboratory staff members and Supervisors are authorized to generate diazomethane for use in the herbicide methods. Not only is diazomethane very toxic, the gas and liquids can explode readily if handled improperly.

The procedure to generate Diazomethane reagent for the methylation of herbicide extracts from water, soil, and waste samples must be carefully followed. The final product, Diazomethane, is an explosive agent, and ether is a very flammable solvent. Therefore, the procedure must be performed under a hood, at no point it should be left unattended, and flammable solvents must be kept away from the hotplate. Also, to avoid explosion, none of the glassware joints can be ground glass joints. All other normal safety precautions should also be taken.

Glass solvent containers should always be carried with one hand supporting the bottom of the container and another holding the neck area. When carrying solvents for distances further than across an aisle a rubber carrier should be used to transport the solvent bottle.

Work with the minimum amount of flammable solvent required by the testing procedure. Transfer solvents under a fume hood. All chemicals should be returned to the appropriate storage cabinet or area at the completion of the test or end of the day. All compressed gas cylinders are to be secured to a Laboratory bench or the wall. Gas cylinders cannot be secured to a bench that has wheels. See other chapters in the Chemical Hygiene Plan for chemical handling and storage requirements.

8. Hazard Identification Markings for Storage Areas

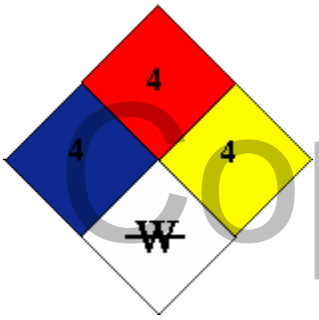
All hazardous and flammable solvents, acids, bases and solid chemical are stored in appropriate storage containers and cabinets. All storage areas and cabinets are identified with the type of

storage and appropriate hazard codes. The major classes identified by storage label are:

- Flammables
- Oxidizers
- Corrosives
    - acids
    - bases
- Highly Reactives
- Extreme Toxics/Regulated Materials
- Low Hazard

The NFPA labeling system utilizes a diamond diagram divided into four color coded sections:

- Blue – Health Hazard
- Red – Fire Hazard
- Yellow – Reactivity Hazard
- White – Other Hazard Information



Within each section is a number ranking the degree of the hazard:

- 4 – Extreme Hazard
- 3 – Serious Hazard
- 2 – Moderate Hazard
- 1 – Slight Hazard
- 0 – No or Minimal Hazard

The white section alerts the user to special hazards the material may possess such as water reactivity, strong oxidizer, corrosivity, and radioactivity.

See additional chemical handling and storage requirements in the EPD Laboratory Chemical Hygiene Plan.

9. Location of posted Emergency Procedures

Emergency response procedures such as evacuation routes are posted next to the exit door of every room in the laboratory. Primary and secondary routes are always presented along with instructions. Additional emergency procedures are posted when necessary and provided in this

plan.

The daily sign in sheet and a blank Laboratory Staff Report, Form 1 must be kept where the two documents can be taken with the Laboratory Manager or Supervisor as they evacuate the laboratory building in an emergency. The Laboratory Staff Report will be presented to the arriving fire department to identify staff members present that day and have been accounted for after building evacuation. Any missing staff members will be immediately brought to the fire department's attention.

10. Emergency Evacuation Plan

In the event of any fire, the first response of any laboratory staff member is to sound the fire alarm by locating and pulling the alarm. Only then and if the fire can be immediately controlled should a staff member attempt to extinguish a fire. Conditions other than a fire that may require building evacuation include flammable solvent spills, large volume gas leaks, or any other emergency in which health and life are a concern.

The Laboratory Manager or Supervisor in the absence of the Manager should take the daily sign in sheet and a Laboratory Staff Report upon evacuating the building. Each Laboratory should meet in its assigned area or another area as instructed by the responding fire department and immediately accounts for each staff member present that day. It is critical to the efforts of the responding fire department that no staff member from the EPD Laboratory interferes with efforts to extinguish the fire. All laboratory personnel are to exit the Laboratory and proceed to the vacant parking lot across Peachtree CNRS. Laboratories exiting the back of the Laboratory are to walk around the North end of the Laboratory and move to the vacant parking lots across Peachtree CNRS. Once in the parking lot each laboratory section should join their Laboratory Managers who should quickly account for all staff members present and complete the Laboratory Staff Report. If a staff member is missing, immediately locate and notify the fire department liaison informing them of the person's assigned area. The Laboratory Director and QA Manager will gather the Staff Reports and deliver them to the appropriate Fire Department liaison.

The Laboratory Director, QA Manger or Manager in charge of the Laboratory should immediately notify the EPD Branch Chief or in his absence the Assistant Division Director of the nature of the incident and actions being taken. No information is to be given to directly to news reporters or media outlets unless approved to do so by the Branch Chief or Assistant Director.

11. Fire Event Procedure

1. Sound the fire alarm.
2. Attempt to extinguish with the appropriate fire extinguisher.
3. If attempts to extinguish the fire appear to be failing, exit the building quickly and safely.

4. If attempt to extinguish the fire have succeeded, exit the building and locate your Laboratory Manager.
5. Notify your Laboratory Manager once outside about what has happened.

12. Evacuation Procedure

Upon hearing a fire alarm:

1. Do not assume the alarm is a drill.
2. Stop working and stabilize any test activities if it can be accomplished safely and quickly. Pull fume hood sashes down.
3. Notify others if it appears they do not hear the alarm.
4. Leave all lights on, exit the room and close the door.
5. Exit the building through the closest and safest route. Evacuation maps are posted next to each laboratory door. Note secondary routes in case the primary route is blocked.
6. If you left your work area in a condition that could pose a hazard, notify your Laboratory Manager as soon as possible. Managers should notify the fire department liaison immediately.
7. Move as quickly and safely to the vacant parking lot across Peachtree CRNS.
8. A Laboratory Manager or Director should call 911 and report the fire.
9. Only through the Laboratory Managers will the fire department liaison provide notification that it is safe to reenter the building.
10. Do not return to the building until directed to do so by your Laboratory Managers.

13. Additional Evacuation Procedure for Physically Challenged

For Laboratory Managers and Supervisors:

1. If you have a staff member or guest with a physically challenging condition you are responsible for assisting the staff member or guest from the building. Quickly locate the staff member and escort them from the building quickly and safely.
2. Individuals in wheel chairs should be evacuated from the building through sample receipt or the front entrance to the building. Both are equipped with ramps.

14. Building Re-entry Procedures.

1. Only Laboratory Managers and Supervisors are to re-enter the building after a fire event or other emergency requiring the evacuation of the building.
2. All other staff members are to wait in the vacant parking lot across Peachtree CNRS.
3. Managers and Supervisors are to immediately inspect each laboratory area under their supervision and report any unsafe conditions to the fire department liaison and Laboratory Director.
4. All aspects of the unsafe condition must be resolved before the staff can be allowed to

return.

5. After the laboratory inspections the Manager and/or Supervisor should report all safe to the Laboratory Director.
6. The remaining laboratory staff may then re-enter the building.

16. Post Incident Response and Reports

The Laboratory Director, QA Manger, or Manager in charge will immediately notify the Branch Chief or Assistant Director of the outcome of the fire department response. A complete report of the incident will be completed using the incident form in section Y of the Chemical Hygiene Plan. A complete narrative and picture report will be included with the form.