Idaho State Police

Forensic Services

Health And Safety Manual

History Page

The original versions of the Health and Safety Manual are dated 1991 and 1996.

Revision 1, totally revised from revision 0 contains 21 chapters:
_____ 12-24-01 Revision 1 is effective February 1, 2002
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1
INTRODUCTION

This manual is comprised of a general laboratory safety plan, chemical hygiene plan, and an exposure control plan. The goal of this manual is to furnish employees with a safe environment and a place of employment where recognized hazards that cause, or are likely to cause, death or serious physical harm are minimized to the extent possible.

2
RESPONSIBILITIES

2.1 Laboratory Manager - The Laboratory Manager has the ultimate responsibility for safety within the Forensic Services laboratory and will, with other administrators, provide continuing support for safety training, inspections, and equipment.

2.2 Safety Officer – Safety Officers are responsible for safety in their laboratory section(s). This includes:

2.2.1 Ensuring employees know and follow safety rules; protective apparel and safety equipment are available and in working order; and appropriate training is provided (for instance, location and use of spill equipment).

2.2.2 Providing regular, formal safety and housekeeping inspections including routine inspections of safety equipment.

2.2.3 Ensuring the laboratory is in compliance with the department and unit health and safety policies on the safe handling of chemicals, blood borne pathogens, or other hazardous materials employees may come in contact with during laboratory operations.

2.2.4 Reviewing and updating the Health and Safety manual regularly (recommended annually), reflecting changes in work practices, and exposure to occupational hazards.

2.2.5 Providing for and coordinating vaccinations, post-exposure follow-up programs and work related accident and illness reporting.

2.2.6 Evaluating the necessity of using chemicals that are highly carcinogenic, flammable, or reproductive toxins.

2.2.7 Ensuring Material Safety Data Sheets (MSDS) are available in a location accessible to all employees (via Internet is acceptable).

2.3 Laboratory Employee - Each individual has a basic responsibility to himself/herself and colleagues to plan and execute laboratory operations in a safe manner. This includes:

2.3.1 Planning and conducting each operation in accordance with written and practical safety procedures.

2.3.2 Consulting the appropriate procedure and considering safety in each step.

2.3.3 Preparing a mental plan for actions that will be taken in the event of an accidental spill etc.

2.3.4 Developing good personal hygiene habits and using appropriate personal protective apparel and safety equipment.

2.3.5 Using universal precautions by treating all chemicals and materials as being potentially hazardous.

2.3.6. Treating safety as a first priority. Working safely as a regular, continuing effort, not merely a standby or short-term activity.

2.3.7 Reporting unsafe work conditions and other safety concerns to the Safety Officer or a supervisor.

2.3.8 Warning other personnel if they are entering a hazardous area and providing them with appropriate protective apparel or equipment, if needed, and/or restricting their access to the area.

2.4 Laboratory Safety Committee – The Safety Officers from all three laboratories comprise this committee. The Safety Officers may solicit assistance from other laboratory sections to perform their duties. The Laboratory Safety Committee has responsibilities, which include:

2.4.1 Acting as the designated Chemical Hygiene Committee.

2.4.2 Ensuring an annual safety inspection is completed and documented on each laboratory. This inspection may be done individually by each lab's Safety Officer with assistance from other lab personnel at the discretion of the Safety Officer. All Safety Committee members do not need to be present at each audit.

3
BEST PRACTICES

3.1 Use common sense when working with or around any area where chemicals are being used or stored.

3.2 Be aware of electrical hazards from equipment and other power sources. Many chemicals are efficient conductors of electricity.

3.3 All containers, other than from the manufacturer, must be properly labeled (see Chemical and Reagent Labeling section).

3.4 Keep only the minimum amount of hazardous chemical required at your workstation.

3.5 Store all chemicals and samples in appropriate closed containers and in their designated place (i.e. acid storage cabinet).

3.6 Separate stored chemicals by category, spaced to prevent reactions (i.e. acids, bases, flammables, etc.).

3.7 When chemicals are hand carried, the container should be placed in an outside container or bucket.

3.8 Use appropriate personal protective equipment, such as gloves, safety glasses, face shields, etc., when working with hazardous chemicals or potentially infectious materials.

3.9 Lab coats shall be worn while working in the laboratory. In certain cases, disposable clothing, crime scene outerwear and/or specialized eye, ear and body protection are also available. Employees should ensure visitors to areas where evidence is analyzed are offered protective apparel.

3.10 Keep chemicals and other potentially infectious materials off desks and out of non-laboratory areas such as the break room.

3.11 Evidence is not allowed in offices or on desks. The only acceptable areas for evidence are the front counters in the evidence receipt/return area, the evidence vault, evidence lockers, refrigerator/freezers designated for evidence storage, and in laboratories where evidence is analyzed. ***Exceptions:*** *Latent lift cards, firearms, and ammunition (fired or unfired) may be compared at the examiner's desk provided they are not biologically or chemically contaminated.*

3.12 No oral pipetting of any substance is permitted.

3.13 No food will be stored in the analytical areas or in an evidence or chemical storage refrigerator or freezer.

3.14 Spilled chemicals should be safely cleaned up immediately and disposed of properly. (i.e. Acids should be neutralized prior to disposal).

3.15 Do not taste chemicals for identification.

3.16 Smell chemicals only when absolutely necessary and only by wafting a small amount of vapor towards the nose.

3.17 Cover all open cuts and sores before working with chemicals.

3.18 Avoid working alone in a laboratory if the procedures being conducted are hazardous. If you must work alone, notify someone of your whereabouts.

3.19 Know the location and operation of the nearest eyewash, fire extinguisher, first aid kit, and shower. Become familiar with all exits from the laboratory and the building.

3.20 Provide adequate ventilation so harmful levels of chemical vapors are not achieved.

3.21 When working with hazardous materials it is essential to know about their physical properties and their potential health hazards. Consult Laboratory Chemical Safety Summaries (located in Appendix B of "Prudent Practices in the Laboratory – Handling and Disposal of Chemicals"), MSDS, reference books, periodicals and other reliable resource materials.

3.22 Report all accidents to your Safety Officer or supervisor as soon as practical.

3.23 Practice good personal hygiene by not eating, drinking, smoking, or placing personal items in areas where evidence or chemicals are present. Keep items that may be contaminated, i.e. hands, pens or other instruments, away from the face at all times.

3.24 Wash hands frequently. It is recommended hands be washed before leaving the laboratory. Laboratory coats should be removed before leaving areas where evidence is analyzed. Workers in the evidence receipt/return area where sinks are not closely available shall be provided disposable moist towellets for use but it is recommended that hands be washed with soap and water as soon as practicable.

3.25 The evidence receiving areas and all laboratory areas will be maintained in a clean and sanitary condition. These areas shall be cleaned and disinfected, where appropriate, with a disinfectant such as a 10% bleach solution. The counters in the evidence receiving area and in the laboratories where biohazards are processed shall be disinfected at least weekly.

3.26 Spills of liquid blood or other body fluids should be cleaned up and the area disinfected immediately. Keep in mind each time a piece of evidence is removed from its container and examined, the possibility of contamination of the hands and work area exists.

3.27 General clothing considerations: While in the laboratory, shoes with adequate gripping surfaces should be worn (many dress shoes do not meet this criteria), open-toed sandals are not permitted, long hair and loose-fitting clothing should be secured, and ties should not be worn. When worn in the laboratory, State Police identification tags should be secured inside of one's lab coat to prevent personal injury or contamination.

4
SAFETY TRAINING

4.1 The laboratory will provide educational materials to inform personnel regarding hazardous substances, harmful physical agents and infectious agents.

4.2 Training will include the review of this manual to ensure knowledge of chemical hazards and blood borne pathogens. Training on blood borne pathogens shall include the interactive CD-ROM provided by the California Criminalistics Institute in conjunction with the California Department of Justice. The Safety Officer shall forward the record of training generated by the software upon completion of the CD-ROM to the Quality Assurance Manager.

4.3 It is recommended this manual be reviewed annually with the staff, documented and the record of this training be forwarded to the Quality Assurance Manager.

4.4 It is recommended the staff review the book entitled *Prudent practices in the Laboratory – Handling and Disposal of Chemicals*, a publication of The National Research Council for general laboratory safety including basic electrical safety.

4.5 First Aid/CPR Training:

4.5.1 Mandatory Training – First Aid and CPR training is required for any laboratory personnel who wear respiratory protective equipment during clandestine lab processing. This training will be conducted during working hours and at the laboratory's expense.

4.5.2 Voluntary Training – It is the laboratory's desire to have as many people trained in First Aid and CPR as possible. For those personnel interested in this training, the laboratory will make this training available on an as-requested basis.

5
EVACUATION AND RELOCATION PROCEDURES

5.1 The Safety Officer of each lab shall draft and keep current an Emergency Evacuation and Relocation Plan for fires, bomb threats, utility failures, hazardous materials and other emergencies. This plan may be as simple as a map of the facility showing evacuation routes and the location of a safe meeting place. Evacuation procedures should be practiced annually and documented by the Safety Officer.

5.2 If the extent of the emergency may jeopardize other employees in the building, they will be notified by the Safety Officer or designee and advised to evacuate.

5.3 If there is time and personal safety is not jeopardized, turn off all lights and unnecessary electrical appliances, and close the doors.

5.4 The Laboratory Manager or Safety Officer shall be responsible to see that all laboratory occupants are safely evacuated. This could be achieved by a roll call at the post evacuation meeting place.

5.5 In the event of a hazardous materials incident involving highly toxic materials, only trained clandestine laboratory responders shall take action to contain or clean the spill.

5.6 No employee shall return to the evacuated area or building until the Lab Manager or the Safety Officer has established it is safe to return to the area or building.

6
PERSONAL PROTECTIVE APPAREL AND SAFETY EQUIPMENT

6.1 The proper use of specialized clothing and safety equipment will minimize or eliminate exposure to hazards associated with many laboratory operations.

6.2 The laboratory will provide and maintain a first aid kit(s), spill response equipment, fire extinguishers, emergency eye wash station(s), emergency shower(s), lab coats, protective gloves (i.e. non-latex, Viton, etc), safety glasses, particulate masks, and hand washing facilities or suitable substitute (i.e. anti-bacterial wipes). Other protective apparel and safety equipment may be provided and/or purchased with the approval of Laboratory Management. This equipment shall be maintained by the individual to whom it is issued (i.e. clan lab responder's APRs, Nomex suits, and steel-toed boots).

6.3 The Safety Officer shall provide training to the staff on the location and use of all protective apparel and safety equipment.

6.4 Exhaust hoods and other ventilation devices are available and should be used to prevent exposure to airborne substances.

6.5 Absorbent materials are available for chemical spills. Absorbent materials such as gauze pads and paper toweling are available for potentially infectious materials.

6.6 Specific cabinets are provided for the storage of flammable materials.

6.7 Hand trucks with a securing chain will be used when moving compressed gas cylinders. Securing devices must be provided to hold cylinders in an upright position when in storage or in use.

6.8 Appropriate waste containers and bags are available and must be used for the disposal of sharps and infectious waste.

6.9 Approved disinfectants are available in areas where potentially infectious materials are handled and examined.

7
LABORATORY SAFETY INSPECTIONS

7.1 The Laboratory Safety Officer is responsible to ensure laboratory safety equipment (emergency showers, fire extinguishers) is inspected at least annually. First aid kits should be inspected and restocked if necessary, and the solutions in any wall-mounted emergency eye wash stations should be replaced if they have expired.

7.2 Monthly safety checks of fume hood performance, emergency lighting system, and emergency eye wash station functions, shall be performed and documented by the Safety Officer or designee.

7.3 Locations of emergency eye wash stations, fire extinguishers, spill response equipment, and first aid kits shall be marked with signs.

7.4 Unsafe conditions, areas, and improper use (or non-use) of safety equipment will be brought to the attention of the individual(s) affected, the Safety Officer, and/or their supervisor.

7.5 The Safety Officer will assist in correcting problems that exist and/or meet with the necessary individual(s) to facilitate their correction.

Procedures:

7.5.1 **Emergency Showers:**

Step 1 - Obtain 5-gallon bucket and shower checking funnel.

Step 2 - Place bucket under shower and place funnel over showerhead.

Step 3 - Pull chain, rod or handle on shower.

Step 4 - Let shower run for approximately 30 seconds or until bucket is 1/2 full. Bucket should have one (1) gallon or greater of water after 30 seconds.

Step 5 - Release chain, rod or handle on shower.

Step 6 - Empty bucket.

Step 7 - Continue flushing until water is clean.

Step 8 - Allow excess water to drain from showerhead and funnel into bucket. Wipe up any water spilled on the floor.

Step 9 - Return bucket and funnel to the proper location.

7.5.2 **Emergency Eyewash Stations:**
Step 1 - Start flow of water.

Step 2 - Continue flushing until water is clean.

Step 3 - Observe flow to assure spray is even and meets in the center.

Step 4 - Stop flow of water. Wipe up any spilled water.

7.5.3 **Local Exhaust Systems (Fume hoods):** A baseline measurement of airflow patterns, velocities and volume will be made with a velometer or other similar instrument. Monthly measurements of the airflow patterns, velocities and volumes will be made utilizing the same type of instrument used during the baseline evaluation. The monthly measurements will be documented. An inspection of each ventilation hood shall be performed annually by an approved provider (i.e. Quality Control Services).

8
HEALTH HAZARD MONITORING AND SURVEYING

8.1 The Hepatitis A and B vaccination series and a Tetanus shot are offered to all laboratory employees. Immunization titer level will be tested after completion of the Hepatitis B series. If a titer is not developed, a booster shot shall be provided. If the booster shot does not provide a titer, then the individual cannot physically develop a titer for Hepatitis B. (Consult ISP Procedure "Exposure to Blood Borne Pathogens or Hazardous Materials" located in the ISP Employee Handbook (Outlook, Public Folders, All Public Folders, Employee Handbook).

8.2 Employees who decline the provided vaccinations must sign the Vaccination Declination Form located in the Appendix of this manual indicating they understand the potential health consequences of not receiving the vaccinations.

8.3 A baseline hearing test will be provided to firearms examiners. Assessment of hearing levels will be conducted annually after baseline is established. If test-firing tanks are located in a fully enclosed room, blood lead levels will also be assessed annually for laboratory firearm examiners.

8.4 Results of provided health tests will be made available to the individual at the time they are received and as requested by that individual.

8.5 Health monitoring records will be filed with the ISP Training Specialist assigned to health and fitness duties, as per ISP Procedure "Exposure To Bloodborne Pathogens or Hazardous Materials" located in the ISP Employee Handbook (Outlook, Public Folders, All Public Folders, Employee Handbook).

9

HANDLING AND USE OF FIREARMS, AMMUNITION, AND EXPLOSIVE DEVICES

9.1 Firearms, ammunition and explosive devices will be handled as if they are functionally operational.

9.2 All firearms being submitted or handled will be treated as if they are loaded until a safety inspection ensures that the weapon is unloaded.

9.3 No firearm should be loaded in the laboratory except in designated test-firing areas. Check the bore of the firearm for obstruction prior to loading.

9.4 Eye and ear protection will be worn when test firing.

9.5 Test firing should not be done alone if possible.

9.6 There should be proper ventilation during test-firings.

10
HANDLING AND USE OF LASER AND ALTERNATE LIGHT SOURCES

10.1 Goggles or other appropriate filters will be used for most examinations to minimize radiation exposure from laser and alternate light sources, which may cause eye or skin damage. The operator and any observers must be provided with adequate protection.

10.2 Individuals trained in their use will operate laser and alternative light sources.

10.3 Never look directly into the laser or light source aperture when the unit is emitting light. Care must be taken to protect the operator and observers from direct and reflected light.

10.4 Do not move optical elements or shiny objects into or out of the laser beam while the laser or alternate light source is operating unless barrier filters are being used. Potentially blinding stray reflections may occur.

10.5 Do not place hands into an unexpanded laser beam path. A full power unexpanded beam will burn human skin in 10 seconds or less.

11
ORDERING OF CHEMICALS

11.1 When it is determined that a chemical is not available in the laboratory, the following steps should be taken:

11.1.1 Order chemicals in the smallest quantity practical or what could be used in six (6) to nine (9) months.

11.1.2 Chemicals should be ordered in non-breakable or break- resistant containers whenever possible.

11.1.3 Orders for new chemicals identified as carcinogens, reproductive toxins and chemicals producing a high degree of chronic or acute toxicity, must be approved by the Laboratory Manager with the recommendation of the Safety Officer. See list of known or suspected carcinogens at www.bnl.gov/esh/shsd/cms/Safety_Carcinogens.htm. Consult MSDS sheet or www.msdssheets.com to determine if a chemical is an embryo toxin (harmful to the embryo), mutagen (substance which can cause changes in the DNA of cells), and/or teratogen (substance which can cause birth defects).

11.1.4 Prior to approval, the Safety Officer will determine sufficient control measures are available to minimize employee exposure and materials are available to handle potential spills.

12
CHEMICAL RECEIPT

12.1 Appropriate personal protective apparel and equipment should be used when opening packages. Packages containing carcinogens, suspected carcinogens, reproductive toxins, allergens and highly toxic materials should be opened in a hood or containment device where exposure will be minimized.

12.2 Individual containers will be checked for content, breakage or leaks, and intact label(s). Do not accept containers that are broken, leaking, unlabeled, labels that are unreadable, or chemicals that were not ordered. Contact the supplier to have these items picked up. DO NOT take responsibility for the disposal of rejected chemicals and/or containers.

12.3 Chemical containers shall be marked with the date they were received.

13
CHEMICAL STORAGE

13.1 Suspected carcinogens, mutagens, teratogens, highly and moderately chronic toxins and highly acute toxins should be stored in areas, which are well ventilated with restricted access and with special warning signs. Store breakable containers in chemically resistant trays.

13.2 All chemicals must be stored in properly labeled, closed containers in a cool, dry location.

13.3 Utmost care must be exercised to ensure that incompatible chemicals cannot come in contact with each other. Chemicals in Column A are incompatible with the chemical directly across in Column B (table below) and should be kept separate.

CLASSES OF INCOMPATIBLE CHEMICALS

Column A	(incompatible with)	Column B
Acids		Bases
Alkali and alkali earth metals (i.e. sodium)		Water
Carbides		Acids
Hydrides		Halogenated organics
Hydroxides, oxides and peroxides		Oxidizing agents *
Inorganic azides		Acids
Heavy metals and their salts		Oxidizing agents *
Inorganic cyanides		Acids, strong bases
Inorganic nitrates		Acids, metals, nitrites, sulfur
Inorganic nitrites		Acids, oxidizing agents *
Inorganic sulfides		Acids
Organic compounds		Oxidizing agents *
Organic acyl halides		Bases, organic hydroxy compounds

Organic anhydrides	Bases, organic hydroxy compounds
Organic halogen compounds	Aluminum metal
Organic nitro compounds	Strong bases
Powdered metals	Acids, oxidizing agents *

(*Oxidizing agents: Chromates, dichromates, halogens, halogenating agents peroxides, hydrogen peroxide, nitric acid, nitrates, chlorates, perchlorates, permanganates persulfates).

13.4 Quantities of flammable liquids in excess of one (1) quart should be stored in a flammable liquid cabinet.

13.5 Hydrofluoric acid needs to be stored in plastic. All other strong acids or strongly acidic solutions should be stored in glass unless stored in the original manufacturer's container. Dilute acid solutions may be stored in plastic.

13.6 Known and suspected carcinogenic substances should be stored in areas of restricted access with warning labels. Consult www.bnl.gov/esh/shsd/cms/Safety_Careinogens.htm

13.7 Store allergens and embryotoxins, properly labeled, in an adequately ventilated area in a non-breakable container. Consult www.msdssheets.com

13.8 Liquids in quantities larger than one (1) pint should not be stored higher than eye level.

13.9 Return chemicals to their proper storage location after use.

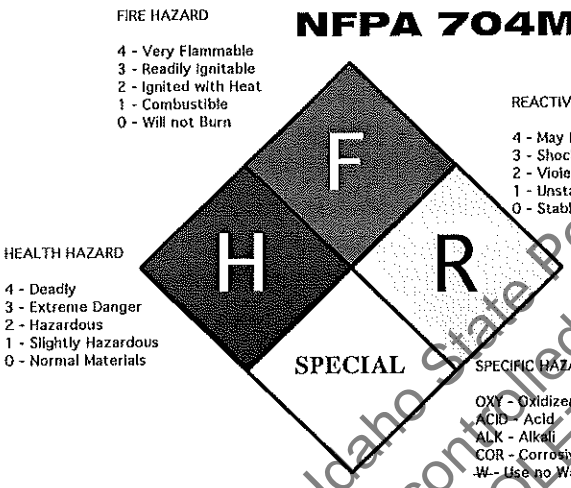
13.10 Whenever possible, substitute highly carcinogenic chemicals mentioned in procedures with a safer alternative chemical if it will not effect the quality of the procedure. (Ex. Toluene instead of benzene as a TLC solvent).

14
CHEMICAL AND REAGENT LABELING

14.1 Chemicals or reagents, not in the original shipping container, will be labeled with the following information:

14.1.1 Chemical or reagent name.

14.1.2 Appropriate NFR/NFPA hazard warnings. Reagents containing more than one chemical will be labeled with both the reagent name (i.e. Marquis) as well as the NFR/NFPA health, flammability and reactivity hazard warning of the most hazardous component (determined by information from the original shipping container, MSDS sheet or a list located in the Appendix). For example, if the most hazardous chemical in a reagent is sulfuric acid, the bottle should be labeled with the NFR/NFPA warnings for sulfuric acid.
Example of an NFR/NFPA label:



14.1.3 Preparation date (and/or lot number if desired).

14.1.4 Expiration date (if appropriate).

14.2 Consumer products in their original containers (i.e. hand soap) are considered acceptably labeled.

14.3 Immediate-use containers, such as test tubes, beakers, graduated cylinders, need not be labeled, with the provision they are not used to store chemicals for longer than one day.

14.4 Employees with questions concerning the appropriate information to use on a label should contact the Safety Officer. If desired, NFPA wall charts can be ordered for a quick reference guide to proper labeling.

15
HANDLING AND USE OF CHEMICALS

15.1 Each individual is responsible for knowing the physical properties and potential health hazards of the chemical(s) they are working with. This information is found on the Material Safety Data Sheets (MSDS) available in the laboratory or at www.msdssheets.com, Chemical Safety Summaries in *Prudent Practices in the Laboratory* (pages 235 – 415), or NFR/NFPA warnings located in the Appendix of this manual.

15.2 ACIDS AND BASES (Corrosives)

15.2.1 Corrosive: pH greater than 12 or less than 2.

15.2.2 Corrosive chemicals will irritate or burn the skin, eyes and respiratory tract. Severe exposure can cause permanent damage.

15.2.3 Add acids or bases to water, not vice versa.

15.2.4 Always pour acid or base slowly to avoid splashing or superheating. If necessary, pour down a glass rod to prevent splashes and spills.

15.2.5 Always make sure there is a source of water in the area when working with corrosive chemicals in case there is an emergency.

15.3 FLAMMABLE LIQUIDS

15.3.1 Whenever flammable vapors are present there are fire and explosion hazards. It is the vapor not the liquid that can burn. Workers must be aware of the hazards of flammable liquids and must take positive measures to eliminate the risk of injury.

15.3.2 Flash point is the temperature at which enough vapor is given off to form an ignitable mixture with air. Chemicals with a flash point of less than 100°F are classified as flammable.

15.3.3 Open flames and smoking are prohibited in all areas where flammable liquids are stored, handled or used.

15.3.4 Avoid prolonged or repeated skin contact.

15.3.5 Use non-sparking electrical equipment in areas where flammable liquids are stored, handled and used.

15.4 ALLERGENS, MUTAGENS, AND EMBRYOTOXINS/TERATOGENS

15.4.1 DEFINITION:

15.4.1.1 Allergen - Causing allergic reaction.

15.4.1.2 Mutagen - Causing a heritable change in the gene structure.

15.4.1.3 Embryo toxin - Poisonous to an embryo (without necessarily poisoning the mother).

15.4.1.4 Teratogen - Producing a malformation of the embryo.

15.4.2 PROTECTIVE EQUIPMENT NEEDED:

15.4.2.1 Allergens: Wear Nitrile or Viton™ gloves, and other personal protective clothing and equipment to prevent skin contact with allergens or substances of unknown allergenic activity. Work in a hood if there is an opportunity for particles to become airborne.

15.4.2.2 Mutagens and Embryotoxins/Teratogens: If you are a woman of childbearing age, handle these substances only in a hood using protective apparel, especially Viton™ (or similar material) gloves, to prevent skin contact.

15.4.2.3 Use of these chemicals should be reviewed with the supervisor prior to initial use, whenever a procedural change is made, and reviewed annually to determine if a less hazardous alternative is available.

15.4.2.4 Store these substances, properly labeled, in an adequately ventilated area in a non-breakable container. Notify the Lab Manager and Safety Officer of all incidents of exposure and a determination will be made if a medical evaluation is needed.

15.5 REACTIVE CHEMICALS

15.5.1 Reactive chemicals are unstable chemicals that can react violently with other chemicals or water to produce heat or dangerous gases. Some reactive chemicals burn when exposed to air or water. Oxidizers may provide extra oxygen in a fire. Consult the NFR/NFPA information located in the Appendix of this manual to find out the reactivity of a specific chemical. Also consult chemical MSDS at www.msdssheets.com

15.5.2 Prior to mixing chemicals of unknown compatibility, a compatibility test should be performed by mixing a small quantity of the chemicals under a fume hood and while wearing proper protective equipment.

15.5.3 Store diethyl ether in metal containers with non-metal lids. Use extreme caution when evaporating ether to dryness during analysis procedures. Be very cautious of EXPLOSIVE PEROXIDE FORMATION.

16

CHEMICAL SPILLS: IMMEDIATE SPILL RESPONSE PROCEDURES

16.1 Evaluate - If necessary, use the safety shower, eyewash and/or sink to decontaminate eyes and skin. (Flush thoroughly for 15 minutes.)

16.2 Evacuate - Clear employees from the area. Remove all sources of ignition if the spilled material is ignitable.

16.3 Contain - Control and contain liquid spills using absorbent materials. Prevent liquids from traveling into sewage systems. Use lab staff trained in the use of personal protective apparel and safety equipment to assist.

16.4 Clean-up- Wear and use appropriate personal protective apparel and safety equipment. Collect spilled waste and absorbent material into a leak-proof closable container. Doubled, heavy-duty plastic bags are sufficient for most spills. Label and dispose of properly. Decontaminate areas where the spill occurred. Neutralize acid and base spills. Wash all potentially exposed skin areas thoroughly after completing the cleanup.

16.5 Notify - Notify the Lab Manager or Safety Officer as soon as practical that a spill has occurred. The Safety Officer will document the spill and evaluate if any further steps are necessary.

17
HAZARDOUS WASTE DISPOSAL

17.1 GENERAL CHEMICAL WASTE HANDLING:

17.1.1 See page 160, section 7.D of *Prudent Practices in the Laboratory – Handling and Disposal of Chemicals* for more in-depth procedures for laboratory-scale treatment of surplus and waste chemicals.

17.1.2 The proper disposal of chemical substances is the responsibility of all laboratory personnel.

17.1.3 All chemical waste containers must be labeled as "waste."

17.1.4 Care should be taken to segregate incompatible substances.

17.2 CHEMICAL DISPOSAL TO THE SEWER SYSTEM

17.2.1 DO NOT discharge to the sewer any combustible, flammable or explosive solids, liquids or gases which by their nature or quantity will or are likely to cause, either alone or by interactions with other substances, a fire or explosion.

17.2.2 Strong acids and bases must be diluted with cold water to the pH 5-10 range before they are neutralized to pH 7. Once acids and bases are neutralized, they can be poured into the sewer system.

17.2.3 DO NOT discharge highly toxic, malodorous or lachrymatory (causes eyes to water) chemicals down the drain (consult MSDS).

17.3 BATTERIES: Batteries should be collected and appropriately disposed of, for instance at the local landfills when they hold free waste disposal days. Contact your landfill for prior approval.

18
COMPRESSED GASES

18.1 Cylinders will be stored in an upright position. Chain or otherwise secure them so they cannot be upset, fall or strike each other.

18.2 Cylinders will be stored in the gas cylinder storage room(s) when not in use. Whenever possible store empty cylinders spaced away from the full cylinders.

18.3 Close all cylinder valves before moving, and when being stored (empty or full). Except when in use, the valve cap or valve protection device must always be in place. Mark the empty cylinders as "Empty" or "MT."

18.4 Extreme care should be used when handling compressed gas cylinders. Do not drop, jar or expose them to temperatures above 50°C (120°F). All cylinders should be handled as if they are full.

18.5 Do not use the valve or valve cap to lift or move cylinders. When moving a cylinder always use a hand truck with the chain secured. Do not roll cylinders.

18.6 Check cylinder labels before use. Color-coding is not a standardized means of identification.

18.7 Periodically check cylinders for rust, dents or leaks. Particularly check around the neck of the cylinder (including the screw threads) and at the bottom. If there is doubt about a cylinder's structural strength or the possibility of leakage contact the supplier for inspection, testing and/or replacement.

18.8 Use the fittings, gauges and regulators suitable for the particular gas being used. Safety valves, gauges and regulators should be securely mounted and may not be used if they are bent or damaged.

18.9 Protect cylinders from sparks, flames and contact with energized equipment.

18.10 Improperly fitting connections on cylinders should never be forced. Do not tamper with safety release devices or cylinder valves. Promptly notify the supplier indicating the type of problem and the cylinder's serial number. Follow the supplier's instructions and/or have the cylinder replaced.

18.11 To prevent contamination of instruments and gas lines, discontinue use of high-pressure cylinders when the pressure approaches 30 psi. Do not bleed cylinders completely empty. Leave a slight pressure to keep contaminants out.

19
HANDLING AND STORAGE OF INFECTIOUS MATERIALS

19.1 "Universal Precautions" is an approach to infection control. According to the concept of Universal Precautions all human blood and body fluids are treated as if known to be infectious for HIV, HBV and other blood borne pathogens. As a part of Universal Precautions, engineering controls and workplace practice controls are designed to minimize worker exposure to infectious materials and potentially infectious materials.

19.2 "Engineering Controls" are controls (e.g., ventilation hoods, sharps disposal containers, etc.), which isolate or remove the blood borne pathogen hazard from the workplace by physical or mechanical means.

19.2.1 Hand washing facilities are located throughout the laboratory and are readily accessible to employees. When provision of hand washing facilities is not feasible (i.e. crime scenes, evidence receiving areas, etc.) either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels, or antiseptic wipe will be provided.

19.2.2 Ventilation: Biological safety cabinets or ventilation hoods are located in laboratory sections where body fluids and other potentially infectious materials are handled and processed. In laboratory sections where contamination of the body fluids/infectious materials is not a factor in the analysis (i.e. latent section when dealing with fingerprints in blood), ventilation hood offers the same protection to the individual.

19.2.3 Waste containers used for the collection of contaminated infectious waste materials for disposal will be leak proof, closable, sealable and marked as above.

19.3 "Work Practice Controls" are controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., use of personal protective equipment, one-handed needle recapping method).

19.3.1 Handling: Specimens of blood or other potentially infectious materials must be placed in a container, which prevents leakage during handling, processing, storage, transport and shipping.

19.3.2 Apparel: Cover and bandage all cuts, wounds and abrasions prior to gloving or covering with protective clothing and before performing any work-related duties involving infectious materials. Analysts will wear gloves and lab coats, gowns or other protective clothing when handling items containing body fluids or other potentially infectious materials. Supervisors may determine additional precautions to be used. Blood tubes will be opened wearing gloves and lab coat and either:

19.3.2.1 Within a ventilation hood with the sash lowered or

19.3.2.2 Wearing a face shield or

19.3.2.3 Wearing safety glasses and a facemask.

19.3.3 Decontamination: Employees will wash their hands and any other exposed skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. It is recommended hands be washed before leaving the laboratory.
Contaminated areas shall be cleaned using a 10% bleach solution or a suitable substitute.

19.3.4 Sharps: Sharps, if submitted according to ISP Forensic Services Evidence Handling Procedure (Chapter 3 of Procedure Manual), must not be bent, recapped or removed except as noted below. Shearing or breaking of needles is prohibited.

19.3.4.1 Contaminated needles and sharps will not be recapped or removed unless no alternative is feasible.

19.3.4.2 Such recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

19.3.4.3 Sharps for disposal must be placed in containers that are:

19.3.4.3.1 Puncture resistant.

19.3.4.3.2 Marked either "Biohazard" or "Sharps."

19.3.4.3.3 Leak-proof on the sides and bottom.

19.3.4.3.4 Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found.

19.3.4.3.5 Maintained upright throughout use.

19.3.4.3.6 Replaced routinely and not allowed to overfill.

19.3.4.4 Broken glassware, which may be contaminated should not be picked up directly with the hands. It should be cleaned up using mechanical means such as a brush and dustpan, tongs or forceps.

19.3.4.5 Contaminated reusable sharps will be placed, immediately or as soon as possible after use, into appropriate containers until properly disinfected.

19.3.5 Laundry: Contaminated laundry should be handled as little as possible with a minimum of agitation. **Do not** allow sharps to be placed into laundry containers.

19.3.5.1 Laundry contaminated with excessive amounts of blood or other potentially infectious materials will be placed into a leak proof "biohazard" bag and the bag tied closed at the location where it was used, then autoclaved.

19.3.5.2 Employees who have contact with contaminated laundry must wear protective gloves and other appropriate personal protective equipment.

19.4 STORAGE

19.4.1 Liquid blood and other liquid potentially infectious materials shall be refrigerated or frozen when they are not being handled or processed. Small amounts of residual blood remaining in sexual assault kits after analysis may be stored with other evidence from the case provided care is taken to assure tubes are closed and liquid will not leak from the kit.

19.4.2 Warning labels (i.e. "Biohazard" stickers) should be affixed to containers used to store, transport or ship blood or other potentially infectious materials. Warning labels should also be affixed to containers of regulated waste and refrigerators and freezers containing blood or other potentially infectious material.

20
INFECTIOUS MATERIAL SPILLS: IMMEDIATE SPILL RESPONSE PROCEDURES

20.1 Evaluate - If necessary, use the safety shower, eyewash and/or sink to decontaminate eyes and skin. (Flush thoroughly for 15 minutes.)

20.2 Evacuate - Warn employees in the immediate area of the spill. If appropriate, clear employees from the area.

20.3 Contain - Control and contain liquid spills using absorbent materials. Wear appropriate clothing and equipment (**a minimum** of Nitrile gloves and lab coat, gown or other protective outer garment). Goggles and facemask and/or shoe coverings may also be appropriate.

20.4 Clean up - Use appropriate personal protective apparel and safety equipment. Collect spilled waste and absorbent material into an infectious waste container. Contaminated broken glass should be cleaned up using mechanical means such as a brush and dustpan, tongs or forceps. Label and dispose of properly following waste procedures. Decontaminate areas where the spill occurred and the equipment used to clean up the spill with a 10% bleach solution.

20.5 Notify - Notify the Lab Manager or Safety Officer that a spill has occurred, how it was cleaned-up and the generation of any infectious waste as soon as practicable. The Safety Officer will document the spill and evaluate if further steps are necessary.

21
HANDLING AND DISPOSAL OF INFECTIOUS WASTE

21.1 Liquid blood and urine may be discharged to the sewer system only after autoclaving. Decontaminate sinks and other work surfaces as soon as feasible. Decontaminate reusable containers prior to reuse.

21.2 Solid infectious waste will be autoclaved and disposed with other solid waste.

APPENDIX

VACCINATION DECLINATION FORM

(Mandatory)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis A virus (HAV), hepatitis B virus (HBV), and/or Tetanus. I have been given the opportunity to be vaccinated for the above listed infections at no charge to myself.

However, I decline the _____ vaccination(s) at this time. I understand that by declining the vaccine(s), I continue to be at risk of acquiring hepatitis A, hepatitis B, and Tetanus. If in the future I continue to have occupational exposure to blood or other potentially infectious material and I want to be vaccinated with the above mentioned vaccine(s), I can receive the vaccination series at no charge to me.

Signature _____

Printed name _____

Job Title _____

Date _____

NFPA Table

Chemical Name	CAS #	H	F	R	Special
ACETALDEHYDE	75070	2	4		
ACETIC ACID, [GLACIAL]	64197	2	2		
ACETIC ANHYDRIDE	108247	2	2		
ACETONE	67641	1	3		
ACETONE CYANOHYDRIN	75865	3	2		
ACETONITRILE	75058	3	3		
ACETOPHENONE	98862	1	2		
ACETYL CHLORIDE	75365	3	3		**No water**
ACETYLENE	74862	1	4		
ACETYLENE TETRABROMIDE	79276	3	1		
ACETYL PEROXIDE SOLUTION,[<=25% PEROXIDE]	110225	1	2		
ACROLEIN DIMER, [STABILIZED]	100732	1	2		
ACROLEIN, [INHIBITED]	107028	3	3		
ACRYLAMIDE	79061	3	2		
ACRYLIC ACID	79107	3	2		
ACRYLONITRILE	107131	4	3		
ADIPIC ACID	124049		1		
ADIPONITRILE	111693	4	2		
ALKYL ALUMINUM HALIDES		3	4		**No water**
ALLYL ALCOHOL	107186	3	3		
ALLYLAMINE	107119	3	3		
ALLYL BROMIDE	106956	3	3		
ALLYL CHLORIDE	107051	3	3		
ALLYL CHLOROCARBONATE	2937500	3	3		
ALUMINUM ALKYL CHLORIDE		3	4		**No water**
ALUMINUM CHLORIDE, [ANHYDROUS]	7446700	3	0		**No water**
ALUMINUM PHOSPHIDE	20859738	3	4		**No water**
ALUMINUM POWDER, [METALLIC]	7429905	0	1		
ALUMINUM TRIETHYL	97938	3	4		**No water**
AMMONIA, [ANHYDROUS]	7664417	3	1		
AMMONIUM BICHROMATE	7789095	2	1		**Oxidizer**
AMMONIUM FLUORIDE	12125018	3	0		
AMMONIUM NITRATE, [NO ORGANIC COATING]	6484522	1	0		**Oxidizer**
AMMONIUM NITRATE, [ORGANIC COATING]	6484522	1	0		**Oxidizer**
AMMONIUM PERCHLORATE, [OXIDIZER]	7790989	1	0		**Oxidizer**
AMMONIUM PERMANGANATE	13446101	1	0		**Oxidizer**
AMYL ACETATE	628637	1	3		
AMYL ALCOHOL	71410	1	3		
N-SEC-AMYL ALCOHOL		0	2		
TERT-AMYL ALCOHOL	75854	1	3		
AMYLAMINE	110587	2	3		

AMYL MERCAPTAN	110667	2	3	0	
AMYL NITRATE	1002160	2	2	3	Oxidizer
ANILINE	62533	3	2	0	
ANTIMONY PENTACHLORIDE	7647189	3	0	1	
ANTIMONY PENTAFLUORIDE	7783702	3	0	1	
ANTIMONY SULFIDE, [SOLID]	12627520	2	1	1	
ARSENIC PENTOXIDE, [SOLID]	1303282	2	0	0	
ARSENIC TRICHLORIDE, [LIQUID]	7784341	3	0	0	
ARSENIC TRIOXIDE, [SOLID]	1327533	2	0	0	
ARSENIC TRISULFIDE	1303339	2	0	0	
ARSINE	7784421	4	4	2	
ASPHALT	8052424	0	1		
BARIUM CHLORATE	13477004	2	0	1	Oxidizer
BENZALDEHYDE	100527	2	2	0	
BENZENE	71432	2	3	0	
BENZOTRICHLORIDE	98077	3	3	1	
BENZOYL CHLORIDE	98884	3	2	1	No Water
BENZYL CHLORIDE	100447	2	2	1	
BERYLLIUM, [POWDER]	7440417	3	1	0	
BIS(CHLOROMETHYL) ETHER	542881	3	3	1	
BORON TRIBROMIDE	10294334	4	0	2	No water
BORON TRIFLUORIDE	7637072	4	0	1	
BROMINE	7726956	3	0	0	Oxidizer
BROMINE PENTAFLUORIDE	7789302	4	0	3	No Water; Oxidizer
BROMINE TRIFLUORIDE	7787715	4	0	3	No Water; Oxidizer
BROMOPENTANE	29756385	1	3	0	
BROMOPROPYNE	106967	4	3	1	
1,3-BUTADIENE, [INHIBITED]	106990	2	4	2	
BUTANE	106978	1	4	0	
BUTENE	25167673	1	4	0	
BUTYL ACETATE	123864	1	3	0	
BUTYL ACRYLATE	141322	2	2	2	
BUTYL ALCOHOL	35296721	1	3	0	
N-BUTYL ALCOHOL	71363	1	3	0	
SEC-BUTYL ALCOHOL	78922	1	3	0	
TERT-BUTYL ALCOHOL	75650	1	3	0	
BUTYLAMINE	109739	3	3	0	
1,2-BUTYLENE OXIDE	106887	2	3	2	
BUTYL ETHER	142961	2	3	1	
TERT-BUTYL HYDROPEROXIDE	75912	1	4	4	Oxidizer
BUTYL LITHIUM	109728	3	4	2	No water
TERT-BUTYL PEROXYACETATE, [<= 76% IN SOLUTION]	107711	2	3	4	Oxidizer
TERT-BUTYL PEROXYACETATE	107711	2	3	4	Oxidizer
TERT-BUTYL PEROXYBENZOATE, [TECHNICALLY PURE]	614459	1	3	4	Oxidizer

TERT-BUTYL PEROXYPIVALATE, [<= 77% IN SOLUTION]	927071	0	3		**Oxidizer**
N-BUTYL PHTHALATE	84742	0	1		
BUTYRALDEHYDE	123728	2	3		
BUTYRIC ACID	107926	3	2		
CALCIUM CARBIDE	75207	1	3		**No Water**
CALCIUM CHLORATE	10137743	1	0		**Oxidizer**
CALCIUM CYANIDE, [SOLID]	592018	3	0		
CALCIUM HYPOCHLORITE MIXTURE, [DRY, WITH >39% AVAILABLE CHLORINE]	7778543	1	0		**Oxidizer**
CALCIUM, METAL	7440702	1	1		**No water**
CALCIUM, METAL, [CRYSTALLINE]	7440702	1	1		**No water**
CALCIUM OXIDE	1305788	1	0		
CARBON DISULFIDE	75150	2	4		
CARBON MONOXIDE	630080	3	4		
CARBON TETRACHLORIDE	56235	3	0		
CHLORINATED PHENOLS/CHLOROPHENOLS		3	2		
CHLORINE	7782505	3	0		**Oxidizer**
CHLORINE TRIFLUORIDE	7790912	4	0		**No water; Oxidizer**
CHLOROACETIC ACID, [SOLID]	79118	3	1		
CHLOROACETONITRILE	107142	3	2		
CHLOROACETYL CHLORIDE	79049	3	0		
CHLOROBENZENE	108907	2	3		
CHLOROETHANOL	107073	4	2		
CHLOROFORM	67663	2	0		
CHLOROMETHYL METHYL ETHER, [ANHYDROUS]	107302	3	3		
CHLOROPENTANE, [FLAMMABLE LIQUID]	29656631	1	3		
CHLOROPHENOLS, [LIQUID]	25167800	3	2		
CHLOROPHENOLS, [SOLID]	106489	3	1		
CHLOROPICRIN, [LIQUID]	76062	4	0		
CHLOROSILANE, [CORROSIVE LABEL]	13465786	3	3		**No water**
CHLOROSILANE, [EMITS FLAMMABLE GAS WHEN WET, CORROSIVE LABELS]	13465786	3	3		**No water**
CHLOROSILANE, [FLAMMABLE, CORROSIVE LABELS]	13465786	3	3		**No water**
CHLOROSULFONIC ACID	7790945	3	0		**No Water, Oxidizer**
CHROMIC ACID, [SOLID]	7738945/ 11115745	3	0		**Oxidizer**
CHROMIC CHLORIDE	10025737	3	0		
CHROMIUM OXYCHLORIDE	14977618	3	0		**No Water**
COLLODION	9004700	2	3		
CRESOL	1319773	3	2		
M-CRESOL	108394	3	2		
O-CRESOL	95487	3	2		
P-CRESOL	106445	3	2		
CROTONALDEHYDE	4170303	3	3		
CUMENE, [FLAMMABLE LIQUID]	98828	2	3		
CUMENE HYDROPEROXIDE	80159	1	2		**Oxidizer**

CYANOACETIC ACID	372098	3	1	0	
CYANOGEN BROMIDE	506683	3	0	1	
CYANOGEN GAS	460195	4	4	2	
CYCLOHEXANE	110827	1	3	0	
CYCLOHEXANOL	108930	1	2	0	
CYCLOHEXANONE	108941	1	2	0	
CYCLOHEXYLAMINE	108918	2	3	0	
CYCLOPENTANE	287923	1	3	0	
CYCLOPROPANE	75194	1	4	0	
DECABORANE	17702419	3	2	1	
DECANE	124185	0	2	0	
DECYL ALCOHOL	112301	0	2	0	
DIAMYLAMINE	2050922	3	2	0	
DIBORANE	19287457	3	4	3	**No Water**
DIBUTYLAMINE	111922	3	2	0	
DI-TERT-BUTYL PEROXIDE, [TECHNICALLY PURE]	110054	3	2	4	**Oxidizer**
DICHLOROACETYL CHLORIDE	79367	3	2	1	**No water**
DICHLOROANILINE	27134276	3	1	0	
O-DICHLOROBENZENE, [LIQUID]	95501	2	2	0	
DICHLOROETHYLENE	25323302	2	3	2	
1,2-DICHLOROETHYLENE	540590	2	3	2	
1,2-DICHLOROETHYLENE	156605	2	3	2	
DICHLOROETHYL ETHER	111444	3	2	1	
DICHLOROMETHANE	75092	2	1	0	
1,2-DICHLOROPROPANE	78875	2	3	0	
DICHLOROPROPENE	26952238	3	3	0	
1,3-DICHLOROPROPENE	542756	3	3	0	
DICHLOROSILANE	4109960	3	4	2	**No water**
DIETHANOLAMINE	111422	1	1	0	
DIETHYL ALUMINUM CHLORIDE	96106	3	4	3	**No water**
DIETHYLAMINE	109897	3	3	0	
DIETHYLCARBINOL	584021	1	2	0	
DIETHYLENE GLYCOL	111466	1	1	0	
DIETHYLENETRIAMINE	111400	3	1	0	
DIETHYL PHTHALATE	84662	0	1	0	
DIETHYL SULFATE	64675	3	1	1	
DIETHYLZINC	557200	1	4	3	**No water**
DIISOPROPYLAMINE	108189	3	3	0	
DIISOPROPYL ETHER	108203	2	3	1	
DIKETENE	674828	3	2	2	
DIMETHYLAMINE, [ANHYDROUS]	124403	3	4	0	
DIMETHYLAMINE, [AQUEOUS SOLUTION]	124403	3	4	0	
DIMETHYLHYDRAZINE, [UNSYMMETRICAL]	57147	3	3	1	
DIMETHYL SULFATE	77781	4	2	0	
DIMETHYL SULFIDE	75183	2	4	0	

2,4-DINITROANILINE	97029	3	1		
O-DINITROBENZENE	528290	3	1		
DINITROCHLOROBENZENE	97007/25567673	3	1		
DINITROTOLUENE, [LIQUID]	25321146	3	1		
DINITROTOLUENE, [SOLID]	25321146	3	1		
DI-N-OCTYL PHTHALATE	117840	0	1		
1,4-DIOXANE	123911	2	3		
DIPROPYLENE GLYCOL	25265718	0	1		
DIVINYL BENEZENE, [COMBUSTIBLE LIQUID LABEL]		2	2		
DIVINYL BENZENE, [FLAMMABLE LIQUID LABEL]	108576	2	2		
DIVINYL ETHER	109933	2	3		
EPICHLOROHYDRIN	106898	3	3		
ETHYL ACETATE	141786	1	3		
ETHYL ACRYLATE, [INHIBITED]	140885	2	3		
ETHYL ALCOHOL	64175	0	3		
ETHYLAMINE SOLUTION	75047	3	4		
N-ETHYLANILINE	103695	3	2		
ETHYLBENZENE	100414	2	3		
ETHYLBUTANOL	97950	2	3		
ETHYL BUTYL ACETATE	123660	1	2		
ETHYL CHLORIDE	75003	2	4		
ETHYL CHLOROFORMATE	541413	3	3		
ETHYLENE	74851	1	4		
ETHYLENE CYANOHYDRIN	109784	2	1		
ETHYLENEDIAMINE	107153	3	3		
ETHYLENE DIBROMIDE	106934	3	0		
ETHYLENE DICHLORIDE	107062	2	3		
ETHYLENE GLYCOL	107211	1	1		
ETHYLENEIMINE, [INHIBITED]	151564	3	3		
ETHYLENE OXIDE	75218	2	4		
ETHYL ETHER	60297	2	4		
2-ETHYLHEXYL ACRYLATE	103117	2	2		
ETHYL METHYL ETHER	540670	2	4		
ETHYL NITRITE	109955	2	4		
FLUOBORIC ACID	16872110	3	0		
FLUORINE	7782414	4	0		**No Water; Oxidizer**
FLUORINE, [CRYOGENIC LIQUID]	7782414	4	0		**No Water; Oxidizer**
FORMALDEHYDE SOLUTION, [FLASH POINT <= 141 DEG F.; IN CONTAINERS <= 110 GALLONS]	50000	3	2		
FORMIC ACID	64186	3	2		
FUEL OIL, [COMBUSTIBLE LIQUID LABEL]		0	2		
FUEL OIL, [DIESEL]		0	2		
FUEL OIL, [NO. 1]		0	2		
FUEL OIL, [NO. 2]		0	2		

FUEL OIL, [NO. 4]		0	2	0	
FUEL OIL, [NO. 5]		0	2	0	
FUEL OIL, [NO. 6]		0	2	0	
FURFURAL	98011	2	2	0	
GALLIUM TRICHLORIDE	13450903	3	0	1	
GASOLINE	8006619	1	3	0	
GERMANE	7782652	4	4	0	
GLYCERINE, [CRUDE, CONCENTRATED]	56815	1	1	0	
HEPTANE	142825	1	3	0	
HEXANE	110543	1	3	0	
HEXANOL	111273	1	2	0	
HYDRAZINE, [ANHYDROUS]	302012	3	3		
HYDROBROMIC ACID, [> 49% STRENGTH]	10035106	3	0		
HYDROCYANIC ACID, [LIQUEFIED]	74908	4	4		
HYDROFLUORIC ACID SOLUTION	7664393	4	0	1	
HYDROGEN	1333740	0	4	0	
HYDROGEN BROMIDE	10035106	3	0	0	
HYDROGEN CHLORIDE, [ANHYDROUS]	7647010	3	0	0	
HYDROGEN CHLORIDE, [REFRIGERATED LIQUID]	7647010	3	0	0	
HYDROGEN CYANIDE, [ABSORBED]	74908	4	4		
HYDROGEN FLUORIDE	7664393	4	0	1	
HYDROGEN PEROXIDE SOLUTION, [> 52% PEROXIDE]	7722841	2	0	3	**Oxidizer**
HYDROGEN PEROXIDE SOLUTION, [40% TO 52% PEROXIDE]	7722841	2	0	1	**Oxidizer**
HYDROGEN, [REFRIGERATED LIQUID]	1333740	3	4	0	
HYDROGEN SULFIDE	7783064	3	4	0	
HYDROXYLAMINE	7803498	2	0	3	
ISOAMYL ALCOHOL	123513	1	2	0	
ISO-BUTYL ACETATE	110190	1	3	0	
ISOBUTYRALDEHYDE	78842	2	3		
ISOPHORONE	78591	2	2	0	
ISOPRENE	78795	2	4		
ISOPROPANOL	67630	1	3	0	
ISOPROPYLAMINE	75310	3	4	0	
ISOPROPYL FORMATE	625558	2	3	0	
ISOPROPYL PERCARBONATE, [STABILIZED]	105646	0	4	5	**Oxidizer**
ISOPROPYL PERCARBONATE, [UNSTABILIZED]	105646	0	4	5	**Oxidizer**
KEROSENE	8008206	0	2	0	
LEAD ARSENATE	3687318	2	0	0	
LEAD ARSENATE, [SOLID]	7645252/ 7784409/ 10102484	2	0	0	
LIQUEFIED NATURAL GAS		3	4	1	
LITHIUM ALUMINUM HYDRIDE	16853853	3	2		**No water**
LITHIUM HYDRIDE	7580678	3	2		**No Water**
LITHIUM METAL	7439932	3	2		**No water**

MAGNESIUM ALLOY, [WITH > 50% MAGNESIUM, PELLETS, TURNINGS]		0	1	i	No water
MAGNESIUM ALLOY, [WITH > 50% MAGNESIUM, POWDER]		0	1	i	No water
MAGNESIUM GRANULES COATED, [PARTICLE SIZE >= 149 MICRONS]	7439954	0	1	i	No water
MAGNESIUM, METAL, (POWDERED, PELLETS, TURNINGS, OR RIBBON)	7439954	0	1	i	No water
MALEIC ANHYDRIDE	108316	3	1	i	
MERCURIC CYANIDE, [SOLID]	592041	3	0		
MESITYL OXIDE	141797	3	3	i	
METHACRYLIC ACID	79414	3	2		
METHANOL	67561	1	3		
METHYL ACETATE	79209	1	3		
METHYL ACRYLATE, [INHIBITED]	96333	2	3		
METHYLAMINE, [ANHYDROUS]	74895	3	4		
METHYLAMINE, [AQUEOUS SOLUTION]	74895	3	4		
METHYL BROMIDE AND > 2% CHLOROPICRIN MIXTURE, [LIQUID]	8004099	3	1		
METHYL BROMIDE, LIQUID, [WITH < 2% CHLOROPICRIN]	74839	3	1		
METHYL CHLORIDE	74873	2	4		
METHYLCYCLOPENTANE	96377	2	3		
METHYL DICHLOROSILANE	75547	3	3		No water
METHYL ETHER	115106	2	4		
METHYL ETHYL KETONE	78933	1	3		
METHYL ETHYL PYRIDINE	104905	2	2		
METHYL FORMATE	107313	2	4		
METHYL HYDRAZINE	60344	3	3		
METHYL ISOBUTYL KETONE	108101	2	3		
METHYL ISOCYANATE	624839	4	3		
METHYL METHACRYLATE MONOMER, [INHIBITED]	80626	2	3		
METHYL METHACRYLATE MONOMER, [UNINHIBITED]	80626	2	3		
METHYL ORTHOSILICATE	681845	3	3	i	
METHYLTRICHLOROSILANE	75796	3	3		No water
METHYL VINYL KETONE, [INHIBITED]	78944	3	3		
MONOETHANOLAMINE	141435	2	2		
MORPHOLINE	110918	2	3		
MORPHOLINE, AQUEOUS MIXTURE, [CORROSIVE LABEL]	110918	2	3		
MORPHOLINE, AQUEOUS MIXTURE, [FLAMMABLE LIQUID LABEL]	110918	2	3		
NAPHTHALENE	91203	2	2		
NAPHTHALENE, [MOLTEN]	91203	2	2		
NATURAL GAS, [COMPRESSED]		0	4		
NATURAL GAS, [REFRIGERATED LIQUID]		3	4		

NICKEL CARBONYL	13463393	4	3	0	
NICKEL CATALYST, [DRY]	7440020	2	3	0	
NITRIC ACID, [<=40%]	7697372	3	0	0	
NITRIC ACID, [> 40%]	7697372	3	0	0	**Oxidizer**
NITRIC ACID, [FUMING]	7697372	3	0	1	**Oxidizer**
NITRIC OXIDE	10102439	3	0	0	**Oxidizer**
P-NITROANILINE, [SOLID]	100016	3	1	2	
NITROBENZENE, [LIQUID]	98953	3	2	1	
NITROCELLULOSE, [COLLOIDED, GRANULAR OR FLAKE, WET WITH >= 20% ALCOHOL OR SOLVENT, OR BLOCK, WET WITH >= 25% ALCOHOL]		2	3	0	
NITROCELLULOSE, [COLLOIDED, GRANULAR OR FLAKE, WET WITH >= 20% WATER]		2	3		
NITROCELLULOSE, [WET WITH >= 30% ALCOHOL OR SOLVENT]	9004700	2	3	0	
NITROCELLULOSE, [WET WITH >= 20% WATER]	9004700	1	2	2	
NITROCHLOROBENZENE	121733/100005	3	1	0	
O-NITROCHLOROBENZENE, [LIQUID]	88733	3	1	N	
NITROETHANE	79243	1	3	3	
NITROGEN	7727379	3	0	0	
NITROGEN DIOXIDE, [LIQUID]	10102440	3	0	0	**Oxidizer**
NITROGEN, [REFRIGERATED LIQUID]	7727379	3	0	0	
NITROGEN TETROXIDE, [LIQUID]	10544726	3	0	0	**Oxidizer**
NITROGEN TRIOXIDE	10544737/12033497	3	0	0	**Oxidizer**
NITROMETHANE	75525	1	3	4	
4-NITROPHENOL	100027	3	1	2	
NITROPROPANE	25322014	1	3	2	
2-NITROPROPANE	79469	1	3	2	
NITROTOLUENE	1321126	3	1	1	
P-NITROTOLUENE	99990	3	1	1	
OCTANE	111659	0	3	0	
OCTANOL	111875	1	2	0	
OIL, [MINERAL]		0	1	0	
OILS, EDIBLE: COCONUT		0	1	0	
OILS, EDIBLE: COTTONSEED		0	1	0	
OILS, EDIBLE: LARD		0	1	0	
OILS, EDIBLE: PALM		0	1	0	
OILS, EDIBLE: PEANUT		0	1	0	
OILS, EDIBLE: SOYA BEAN		0	1	0	
OILS, EDIBLE: TUCUM		0	1	0	
OILS, EDIBLE: VEGETABLE		0	1	0	
OILS, MISCELLANEOUS: LINSEED		0	1	0	
OIL, [TRANSFORMER]		0	1	0	

OLEIC ACID	112801	0	1	0	
OLEUM	8014957	3	0	2	**No water**
OXALIC ACID	144627	2	1	0	
OXYGEN, [COMPRESSED]	7782447	3	0	0	**Oxidizer**
OXYGEN, [REFRIGERATED LIQUID]	7782447	3	0	0	**Oxidizer**
PARAFORMALDEHYDE	30525894	2	1	0	
PARALDEHYDE	123637	2	3	1	
PENTABORANE	19624227	4	4	2	
PENTACHLOROPHENOL	87865	3	0	0	
PENTANE	109660	1	4	0	
PERACETIC ACID	79210	3	2	1	**Oxidizer**
PERCHLORIC ACID, [> 50% BUT <= 72% STRENGTH]	7601903	3	0	0	**Oxidizer**
PHENOL, [LIQUID]	108952	3	2	0	
PHENOL, [MOLTEN]	108952	3	2	0	
PHENOL, [SOLID]	108952	3	2	0	
PHENYLMERCURIC ACETATE	62384	3	1	0	
PHENYLMERCURIC ACETATE, [LIQUID]	62384	3	2	0	
PHOSGENE	75445	4	0	1	
PHOSPHINE	7803512	3	4	2	
PHOSPHORIC ACID	7664382	3	0	0	
PHOSPHORUS, [AMORPHOUS, RED]	7723140	1	1	1	
PHOSPHORUS OXYCHLORIDE	10025873	3	0	2	**No water**
PHOSPHORUS PENTACHLORIDE, [SOLID]	10026138	3	0	2	**No water**
PHOSPHORUS PENTASULFIDE	1314803	2	1	2	**No water**
PHOSPHORUS TRIBROMIDE	7789608	3	0	2	**No water**
PHOSPHORUS TRICHLORIDE	7719122	3	0	2	**No water**
PHOSPHORUS, [WHITE, MOLTEN]	7723140	3	4	2	
PHTHALIC ANHYDRIDE	85449	2	1	0	
PICRIC ACID, [WET, WITH >= 10% WATER]	88891	3	4	1	
POLYCHLORINATED BIPHENYLS	various	2	1	0	
POTASSIUM CHLORATE	3811049	1	0	1	**Oxidizer**
POTASSIUM CYANIDE, [SOLID]	151508	3	0	0	
POTASSIUM CYANIDE SOLUTION	151508	3	0	0	
POTASSIUM DICHLORO-S-TRIAZINETRIONE, [DRY, WITH > 39% AVAILABLE CHLORINE]	2244215	3	0	2	**Oxidizer**
POTASSIUM HYDROXIDE, [DRY SOLID, FLAKE, BEAD, OR GRANULAR]	1310583	3	0	1	
POTASSIUM HYDROXIDE, [LIQUID]	1310583	3	0	1	
POTASSIUM, [METAL]	7440097	3	3	2	**No water**
POTASSIUM PERCHLORATE	7778747	1	0	1	**Oxidizer**
POTASSIUM PEROXIDE	17014710	3	0	1	**Oxidizer**
POTASSIUM SULFIDE	1312738/12136491/12136504/37488758	3	1	0	

PROPANE	74986	1	4	0	
PROPARGYL ALCOHOL	107197	3	3	3	
PROPIONALDEHYDE	123386	2	3	2	
PROPIONIC ACID	79094	2	2	0	
PROPIONIC ACID, [SOLUTION]	79094	2	2	0	
PROPIONIC ANHYDRIDE	123626	2	2	1	
PROPYL ACETATE	109604	1	3	0	
N-PROPYLAMINE	107108	3	3	0	
PROPYLENE	115071	1	4	1	
PROPYLENE GLYCOL	57556	0	1	0	
PROPYLENE OXIDE	75569	4	2	2	
PROPYL NITRATE	627134	2	3		**Oxidizer**
PROPYL TRICHLOROSILANE	141571	3	3	1	
PYRIDINE	110861	2	3	0	
PYROXYLIN PLASTIC, RODS, SHEETS, ROLLS, OR TUBES		2	3	2	
SILANE	7803625	2	4	3	
SILANE, (4-AMINOBUTYL)DIETHOXYMETHYL-	3037727	3	2	1	
SILICON CHLORIDE	10026047	3	0	2	**No water**
SILICON TETRAFLUORIDE	7783611	3	0	2	**No water**
SODIUM CHLORATE	7775099	1	0	1	**Oxidizer**
SODIUM CHLORITE	7758192	1	1	1	**Oxidizer**
SODIUM CYANIDE, [SOLID]	143339	3	0	0	
SODIUM CYANIDE SOLUTION	143339	3	0	0	
SODIUM DICHLORO-S-TRIAZINETRIONE, [DRY, CONTAINING > 39% AVAILABLE CHLORINE]	2893789	0	3	2	**No Water; Oxidizer**
SODIUM FLUORIDE, [SOLID]	7681494	2	0	0	
SODIUM HYDRIDE	7646697	3	3	2	**No water**
SODIUM HYDROGEN SULFITE, [SOLID]	7631905	3	1	2	
SODIUM HYDROXIDE, [DRY SOLID, FLAKE, BEAD]	1310732	3	0	1	
SODIUM HYDROXIDE, [LIQUID]	1310732	3	0	1	
SODIUM, [METAL]	7440235	3	3	2	**No water**
SODIUM PERCHLORATE	7601890	2	0	1	**Oxidizer**
SODIUM PEROXIDE	1313606	3	0	1	**Oxidizer**
SODIUM POTASSIUM ALLOY, [LIQUID]	11135812	3	3	2	**No water**
SODIUM POTASSIUM ALLOY, [SOLID]	11135812	3	3	2	**No water**
SODIUM SULFIDE, [ANHYDROUS]	1313822	3	1	1	
SODIUM SULFIDE, [HYDRATED, WITH >= 30% WATER]	1313822	3	1	1	
SODIUM SUPEROXIDE	12034127	3	0	1	**Oxidizer**
STIBINE	7803523	4	4	2	
STYRENE MONOMER, [INHIBITED]	100425	2	3	2	
SULFUR CHLORIDE (MONO)	10025679	2	1	1	
SULFUR DIOXIDE	7446095	3	0	0	
SULFURIC ACID	7664939	3	0	2	**No water**
SULFURIC ACID, [SPENT]	7664939	3	0	2	**No water**

SULFUR, [MOLTEN]	7704349	2	1	0	
SULFUR MONOCHLORIDE	12771083	2	1	1	
SULFUR, [SOLID]	7704349	1	1	0	
SULFURYL CHLORIDE	7791255	3	0	1	
TALLOW		0	1	0	
TETRACHLOROETHYLENE	127184	2	0	0	
TETRAETHYL LEAD, [LIQUID]	78002	3	3	3	
TETRAFLUOROETHYLENE, [INHIBITED]	116143	2	4	3	
TETRAHYDROFURAN	109999	2	3	1	
TETRAHYDRONAPHTHALENE	119642	1	2	0	
TETRAMETHYLLEAD	75741	3	3	3	
THIONYL CHLORIDE	7719097	3	0		**No water**
TIN TETRACHLORIDE, [ANHYDROUS]	7646788	3	0	1	
TIN TETRACHLORIDE, [HYDRATED]	10026069	3	0	1	
TITANIUM TETRACHLORIDE	7550450	3	0		**No Water**
TOLUENE	108883	2	3	0	
TOLUENE-2,4-DIISOCYANATE	584849	3	1		
O-TOLUIDINE	95534	3	2		
TRIBUTYLAMINE	102829	3	2	0	
1,1,1-TRICHLOROETHANE	71556	2	1	0	
1,1,2-TRICHLOROETHANE	79005	3	1	0	
TRICHLOROETHYLENE	79016	2	2	0	
TRICHLOROETHYLSILANE	115219	3	3		**No Water**
MONO-(TRICHLORO) TETRA-(MONOPOTASSIUM DICHLORO)-PENTA-S-TRIAZINETRIONE, [DRY, WITH > 39% AVAILABLE CHLORINE]		3	0		**No Water; Oxidizer**
TRICHLOROSILANE	10025782	3	4		**No water**
TRICHLORO-S-TRIAZINETRIONE, [DRY, CONTAINING > 39% AVAILABLE CHLORINE]	87901	3	0		**Oxidizer**
TRIETHANOLAMINE	102716	2	1	1	
TRIETHYLAMINE	121448	2	3	0	
TRIETHYLENE GLYCOL	112276	1	1	0	
TRIISOBUTYL ALUMINUM	100992	3	4	3	**No water**
TRIMETHOXY SILANE	2487903	3	3	2	
TRIMETHYLAMINE, [ANHYDROUS]	75503	3	4	0	
TRIMETHYLAMINE, AQUEOUS SOLUTION	75503	3	4	0	
TRIPROPYLALUMINUM	102670	3	4	3	**No water**
TURPENTINE	8006642/ 9005907	1	3	0	
VANADIUM TETRACHLORIDE	7632511	3	0		**No water**
VINYL ACETATE	108054	2	3	2	
VINYL CHLORIDE	75014	2	4	2	
VINYLIDENE CHLORIDE, [INHIBITED]	75354	2	4		
VINYL TOLUENE	25013154	2	2	2	
WAXES: PARAFFIN		0	1	0	

XYLENE	1330207	2	3	0	
M-XYLENE	108383	2	3	0	
O-XYLENE	95476	2	3	0	
P-XYLENE	106423	2	3	0	
XYLIDINE	1300738	3	1	0	
2,6-XYLIDINE	87627	3	1	0	
ZINC CHLORATE	10361952	1	0	i	**Oxidizer**
ZINC PHOSPHIDE	1314847	3	3	1	
ZINC PHOSPHIDE, [CONC. > 10%]	1314847	3	3	i	
ZIRCONIUM TETRACHLORIDE, [SOLID]	10026116	3	0	2	**No Water**