

BRUNSWICK

SEWER

DISTRICT

LABORATORY

CHEMICAL

HYGIENE

PLAN

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Brunswick Sewer District

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I. POLICY STATEMENT

Brunswick Sewer District is committed to providing a safe working environment and believes employees have a right to know about health hazards associated with their work. So that employees can make knowledgeable decisions about any personal risks of employment, this Chemical Hygiene Plan includes policies, procedures and responsibilities designed to develop in employees an awareness of potentially hazardous chemicals in the workplace and to train employees in appropriate, safe working conditions.

It is important that employers assume responsibility for laboratory safety. All employees will have access to pertinent safety information through their supervisory staff. The people who work in any given laboratory are best able to detect potential hazards in either the facility or in work procedures. When safety concerns arise, employees are encouraged to contact their supervisor.

A training program has been designed for the benefit and protection of all laboratory employees. necessary information will be available to inform the employee how best to handle hazardous chemicals and how to make use of the new law.

Health & Safety Committee

II. GLOSSARY

The following terms are used as part of the Chemical Hygiene Program:

ACUTE EFFECT An adverse effect on a human or animal body with several symptoms developing rapidly and coming quickly to a crisis.

CARCINOGEN A substance or agent capable of causing or producing cancer in mammals.

CHEMICAL AGENTS A wide variety of fluids that have a high potential for body entry by various means. Some are more toxic than others and require special measures of control for safety and environmental reasons.

CHRONIC EFFECT An adverse effect on a human or animal body with symptoms that develop slowly over a long period of time or which recur frequently.

COMBUSTIBLE LIQUID Liquid having a flash point of 100 degrees Fahrenheit (37.8 degrees C) or higher.

DOT Department of Transportation.

EPA Environmental Protection Agency.

FLAMMABLE LIQUID A liquid with a flash point below 100 degrees Fahrenheit (37.8 degrees C).

FLAMMABLE SOLIDS A solid which will ignite readily or is liable to cause fires under ordinary conditions of transportation through friction or retained heat from manufacturing or processing, and which burns so vigorously and persistently as to create a serious transportation hazard.

INFECTIOUS AGENTS Sources that cause infections either by inhalation, ingestion, or direct contact with the host material.

LABORATORY SCALE Work with chemicals that can easily and safely be manipulated by one person excluding the commercial production of chemicals for sale.

LABORATORY USE A workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

LC 50 The concentration of a material in air which, based on laboratory tests, is expected to kill 50% of a group of test animals when administered as a single exposure (usually 1-4 hours).

LD 50 A single dose of a material which based on laboratory tests is expected to kill 50% of a group of test animals.

MSDS (See SDS)

MUTAGEN A substance or agent capable of altering the genetic material in a living cell.

FEDERAL OSHA The regulatory branch of the Federal Department of Labor concerned with employee safety and health.

STATE OSHA The regulatory branch of the State of Maine Department of Labor concerned with employee safety and health and having jurisdiction over Maine Governmental facilities.

PEL Permissible Exposure Limit. This is the legally allowed concentration in the workplace that is considered a safe level of exposure for an 8-hour shift, 40 hours per week.

pH A measure of the acidity or alkalinity of a substance on a scale of 0 to 14. A pH below 7.0 (neutral) indicates a substance is acidic; a pH above 7.0 indicates a substance is alkaline (basic).

PHYSICAL AGENTS Workplace sources recognized for their potential effects on the body. Heat exposure or excessive noise levels are examples of this risk group.

SDS Safety Data Sheet

SENSITIZERS A substance which on first exposure causes little or no reaction in humans or test animals, but which on repeated exposure may cause a marked response not necessarily limited to the contact site.

STERILITY Changes made in male or female reproductive systems resulting in inability to reproduce.

TERATOGEN A substance or agent to which exposure of a pregnant female can result in malformations in the fetus.

TLV Threshold Limit Value. The airborne concentration of a material to which nearly all persons can be exposed day after day, without adverse effects.

TWA Time Weighted Average. The airborne concentration of a material to which a person is exposed, averaged over the total exposure time-generally the total workday (8-12 hours).

III. STANDARD OPERATING PROCEDURES

Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted to include minimizing exposure and assuming that any mixture of hazardous chemicals is more toxic than the most toxic component.

Basic rules and procedures for working with chemicals:

1. Accidents and spills
 - a. Eye contact: promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention.
 - b. Ingestion: Follow instructions on SDS or call poison control.
 - c. Skin contact: promptly flush the affected area with water and remove any contaminated clothing; use a safety shower when contact is extensive. If symptoms persist after washing, seek medical attention.
 - d. Clean-up: promptly clean up spills, using appropriate protective apparel and equipment and proper disposal.
2. Avoid unnecessary exposure to chemicals.
 - a. Do not smell or taste chemicals. Apparatus that can discharge toxic chemicals (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices.
 - b. Inspect gloves before use.
 - c. Use only those chemicals for which the quality of the available ventilation system is appropriate.
 - d. Avoid eating, drinking, smoking, gum chewing, or applying cosmetics or lip balm in areas where laboratory chemicals are present. Wash hands before conducting these activities.

- e. Avoid storing, handling, or consuming food or beverages in storage areas, refrigerators, glassware, or utensils that are also used for laboratory operation.
- f. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.
- g. Wash areas of exposed skin thoroughly before leaving the laboratory.
- h. Avoid practical jokes or other behavior that might confuse, startle, or distract another worker.
- i. **Do Not** use mouth suction for pipetting or starting a siphon.
- j. Confine long hair and loose clothing.
- k. Always wear shoes in the laboratory, do not wear sandals, perforated shoes, sneakers, or any shoes made of canvas.
- l. Keep the work area clean and uncluttered, with chemicals and equipment properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.
- m. Ensure that appropriate eye protection, where necessary, is worn by all persons, including visitors, in areas where chemicals are stored or handled.
- n. Wear appropriate gloves when the potential for contact with toxic materials exist; inspect the gloves before each use, wash them before removal, and replace them periodically.
- o. Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls. Inspect the respirator before each use.
- p. Use any other protective and emergency apparel and equipment as appropriate.
- q. Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken.

- r. Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.
- s. Use a hood for operations that might result in release of toxic chemical vapors or dust.

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm.

Confirm adequate hood performance before use: keep hood closed at all times except when adjustments within the hood are being made. Keep materials stored in hoods to a minimum, and do not allow materials to block vents or air flow.

Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off."

- t. Be aware of unsafe conditions and see that they are corrected when detected.
3. Failure to follow the Standard Operating Procedures may result in disciplinary actions as set forth in the Personnel Rules and Regulations.

IV. CHEMICAL INVENTORY

A chemical inventory is performed annually, listing all the hazardous chemicals in the laboratory.

Chemicals are listed alphabetically by section according to the most commonly used name (e.g., bleach). A catalog number may be required by some manufacturers for SDS.

Inventories are computerized

V. SAFETY DATA SHEETS

SDSs will be available through SDS Binderworks. The laboratory relies on the chemical manufacturer's information to ascertain whether or not the chemical is hazardous.

The SDS for each chemical is located on SDS Binderworks or in the laboratory. An example of an SDS is in Appendix E.

VI. CHEMICAL STORAGE

Storage of laboratory chemicals presents an ongoing safety concern. Chemicals should be stored according to their compatibility with other chemicals. Chemical storage codes are listed in appendix H. Store only the minimal quantities of chemicals needed for use.

Chemical storage is kept as small as practical. Storage on bench tops and in hoods may cause potential exposure to fire and spills. Keep containers closed. Chemicals should not be stored near electrical outlets. Ventilated cabinets are used for chemical storage only. No food is permitted in lab refrigerators. Flammable liquids are stored in flammable storage cabinets with self-closing doors and proper ventilation according to NFPA standards. Safety cans with a spring-loaded spout are used for transporting flammable liquids.

Containers used for secondary storage of chemicals (a container a chemical is poured into) must be marked with the name of the chemical.

It is recommended that acids should **not** be stored in overhead compartments.

Toxic chemicals, including carcinogens, are stored in ventilated storage areas in unbreakable chemical resistant secondary containers. These containers are labeled "CAUTION: HIGH CHRONIC TOXICITY OR CANCER SUSPECT AGENT". A separate inventory list of carcinogens and suspected carcinogens is maintained by the Assistant General Manager according to federal and state regulations.

Cylinders of compressed gases are strapped or chained to a wall or bench top and are capped when not in use and/or transported.

VII. LABELING

The 29 CFR 1910.1450 contains specific labeling requirements. Labeling must be done on all hazardous chemicals that are shipped and used in the workplace. Labels must not be removed or defaced.

SHIPPED CHEMICALS

Chemical manufacturers, importers and distributors make sure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked with the following information:

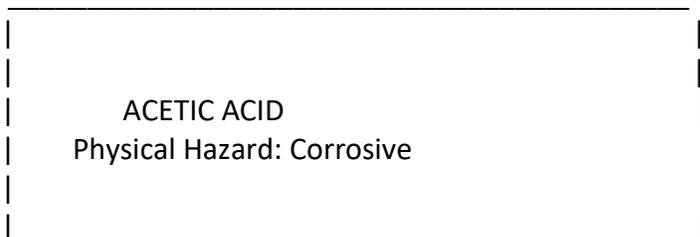
1. Identity of the hazardous chemical
2. Appropriate hazard warnings
3. Name and address of the chemical company (i.e., manufacturer).

ON IN-PLANT CHEMICALS

Each hazardous chemical transferred outside the laboratory that is not in its original container must also be labeled. These workplace labels must contain:

1. Contents of container using full name
2. Main hazard property (i.e. flammable, corrosive, toxic).

An example of a computer-generated label is shown below:



VIII. ENGINEERING CONTROLS

Fume hoods and other protective equipment must function properly. Below are the measures that must be taken to ensure proper and adequate performance of such equipment:

Any hood not passing inspection by the laboratory technician is taken out of service immediately and not used until the hood has passed inspection. As the employer, we accept the responsibility to purchase the parts and to replace the unit in a timely fashion so as not to endanger the health and well-being of an employee or place the facility at risk.

Eyewash fountains must be capable of flushing eyes for a minimum of 15 minutes. Eyewash fountains are inspected every month and records maintained in JobCal.

Safety showers are inspected, tested and flushed monthly and records maintained in JobCal.

Fire extinguishers are inspected monthly by staff and annually by a certified organization.

Ventilated storage cabinets for chemicals are provided as needed and have a separate exhaust duct. These cabinets are located in the laboratory.

Air flow through the laboratory should be relatively uniform and be exhausted to the exterior of the building.

All chemical hygiene-related equipment is monitored routinely and modified if inadequate.

IX. PERSONAL PROTECTIVE EQUIPMENT

Employees are required to wear gloves when the potential exists for the employee to have direct skin contact with blood, hazardous chemicals and infectious materials.

In areas where potential chemical splashes are significant an impervious apron appropriate for the task is worn.

All personal protective equipment is removed promptly after leaving the work area and laundered on site.

Masks and eye protection or face shields are worn to prevent splashes or sprays of potentially infectious materials or hazardous chemicals if there is a potential for eye, nose or mouth contamination. This equipment is obtained from your supervisor; once obtained, the employee is responsible for his/her own eye protection. Disposable air-purifying respirators are available through the safety coordinator or division supervisors.

Where the use of respirators is necessary to maintain exposure within or below permissible exposure limits, the employer provides, at no cost to the employee, the proper respiratory equipment is obtained from your supervisor; once obtained you are responsible for your own respirator. The respirators shall be selected and used in accordance with the requirement of 29 CFR 1910.134 and Brunswick Sewer District's Respiratory Program.

Eye protection, disposable air-purifying respirators and cartridges for the respirator are located in the Lab storage room.

X. CONTAMINATED WASTE REMOVAL\DISPOSAL

All disposal of waste laboratory chemicals is done in accordance with the Maine Department of Environmental Protection regulations.

Certain chemicals are permissible for drain disposal. The drain system connects to an acid neutralization tank, sanitary sewer system then ultimately flows to the wastewater treatment influent. Only those chemicals reasonably soluble in water are suitable for drain disposal. A compound is considered water soluble if it dissolves to the extent of at least 3%. These compounds are flushed with at least 100 volumes of excess water.

Some exceptions should be noted:

1. Those organics with boiling points less than 50 degrees C.
2. Those hydrocarbons, halogenated hydrocarbons, nitro compounds, thiol. and most compounds that contain more than five carbon atoms (e.g., freon).
3. Those chemical compounds that are potentially explosive, such as azides and peroxides.
4. Concentrated acids or bases.
5. Highly toxic malodorous or lachrymatory (eye irritants such as tear gas) substances, or substances which might interfere with the biological activity of the wastewater treatment plant, create fire or explosion hazards, cause structural damage or obstruct flow.

Hoods are not to be used as a means of disposal for volatile chemicals. Disposal by recycling or chemical decontamination is used when possible.

XI. ADMINISTRATIVE CONTROLS

The Chemical Hygiene Officer is responsible for the safe operation of the area when work is being done with the following list of Toxic and Hazardous Substances.

Before working with the following Toxic and Hazardous substances approval must be granted, and the Chemical Hygiene Officer will sit down with the employees to go over specific instructions.

29 CFR 1910 Subpart Z - Toxic and Hazardous Substances

1910.1000	Air Contaminants
1910.1001	Asbestos, tremolite, anthophyllite, and actinolite (eff. 7-21-86)
1910.1002	Coal tar pitch volatiles; interpretation of term
1910.1003	4-Nitrobiphenyl
1910.1004	alpha-Naphthylamine
1910.1005	(Reserved)
1910.1006	Methyl chloromethyl ether
1910.1007	3,3-Dichlorobenzidine (and its salts)
1910.1008	bis-Chloromethyl ether
1910.1009	beta-Naphthylamine
1910.1010	Benzidine
1910.1011	4-Aminodiphenyl
1910.1012	Ethyleneimine
1910.1013	beta-Propiolactone
1910.1014	2-Acetylaminofluorene
1910.1015	4-Dimethylaminoazobenzene
1910.1016	N-Nitroso dimethylamine
1910.1017	Vinyl chloride
1910.1018	Inorganic arsenic
1910.1025	Lead
1910.1027	Cadmium
1910.1028	Benzene
1910.1029	Coke oven emissions
1910.1030	Bloodborne Pathogens
1910.1043	Cotton dust
1910.1044	1,2-dibromo-3-chloropropane
1910.1045	Acrylonitrile
1910.1047	Ethylene oxide
1910.1048	Formaldehyde

1910.1050	Methylenedianiline
1910.1051	1,3 Butadiene
1910.1052	Methylene Chloride
1910.1096	Ionizing Radiation
1910.1101	Asbestos

Chemical spills are contained using the "Think C.L.E.A.N." Plan:

- * Contain the spill.
- * Leave the area.
- * Emergency: eye wash, shower, medical care.
- * Access MSDS.
- * Notify a supervisor.

All spills are contained according to OSHA guidelines, and appropriate spill kits, located in the laboratory, are used.

XII. MEDICAL CONSULTATIONS AND EXAMINATIONS

A First-aid kit must be available to lab personnel.

All employees needing medical attention use the employee health services at Midcoast Hospital, telephone (207) 729-0181 during its hours of operation. For non-emergency care call Concentra 725-2697

All medical examinations and consultations are performed by or under the direct supervision of a licensed physician without cost to the employee, at a reasonable time and place. A board-certified physician in occupational medicine is used whenever possible.

The employee is sent for medical evaluation:

1. Whenever signs and symptoms associated with a hazardous chemical develop.
2. When environmental monitoring reveals an exposure level routinely above the action level.
3. Whenever an event takes place in the work area such as a spill, leak or explosion resulting in hazardous chemical exposure.

The laboratory provides the following information to the physician:

1. Identity of the hazardous chemical(s) to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred -- including quantitative exposure data (if available).
3. A description of the signs and symptoms of exposure.
4. A copy of the SDS for the chemical(s) involved.

The physician provides a written opinion that will not reveal specific finding of diagnosis unrelated to the exposure but will include:

1. Any recommendations for further medical follow-up.
2. Results of the medical examination and any associated tests.
3. Any medical conditions that may be revealed in the course of the examination

that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace.

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

XIII. CHEMICAL HYGIENE OFFICER/DISTRICT

The chemical hygiene responsibilities rest with the Chemical Hygiene Officer who is the Laboratory Technician and receives backing from the District.

The Chemical Hygiene Officer has overall responsibility to:

- * Work with the Supervisors and other employees to develop and implement appropriate chemical hygiene policies and practices
- * Monitor procurement, use and disposal of chemicals used in the lab
- * See that appropriate audits are maintained
- * Help project directors develop precautions and adequate facilities
- * Know the current legal requirements concerning regulated substances
- * Seek ways to improve the chemical hygiene program
- * Have the authority to "shut down" the laboratory if unsafe practices are evident
- * Have a competent designee if he/she leaves the premises

The Laboratory Technician has overall responsibility to:

- * Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided
- * Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment
- * Know the current legal requirements concerning regulated substance
- * Determine the required levels of protective apparel and equipment
- * Ensure that facilities and training for use of any material being ordered are adequate.

The laboratory employee is responsible for:

- * Planning and conducting each operation in accordance with the facility chemical hygiene procedures
- * Developing good personal chemical hygiene habits.

XIV. TRAINING

The Chemical Hygiene Officer is responsible for implementing the Laboratory Chemical Hygiene Plan.

Training is a necessary and important part of the Chemical Hygiene Plan. All employees are trained at the time of the employee's initial assignment to a work area where hazardous chemicals are present and before assignments involving new exposure situations. Refresher information and retraining sessions are held periodically. Training is conducted by a person qualified to train employees in Laboratory Chemical Hygiene. All training is documented in writing by attendance records.

Before training can begin, a lesson plan outlines the expectations of the program and the timeframe for the learning outcome. The lesson plan includes:

I. OBJECTIVES

Upon completion of the Chemical Hygiene Training Program, the employee will be able to:

- A. Locate the potentially hazardous chemicals in the workplace
- B. Recognize the chemical labeling and its meaning
- C. Locate the SDS in the workplace
- D. Locate the health hazard, physical hazard, environmental protection, and special protection sections of the SDS and explain their use
- E. Identify the department Chemical Hygiene Officer by name and title
- F. Discuss the major components of the facility's standard labeling system
- G. Identify the appropriate protective clothing for the area and demonstrate its use
- H. Demonstrate emergency procedures in the event of a hazardous chemical spill
- I. Describe the environmental monitoring protocol.

XV. HOUSEKEEPING

The entire laboratory is to receive a thorough cleaning at least once each week. This includes:

- A. Cleaning and washing the floors
- B. Cleaning all glassware
- C. Dusting and cleaning shelves as needed
- D. Checking for proper storage of chemicals.

The laboratory is to be cleaned at the end of each day and left in a neat and orderly fashion. The minimum items to be taken care of on a daily basis include:

- A. Waste is deposited in appropriate receptacles and properly removed from the laboratory.
- B. Proper storage is accomplished to minimize clutter
- C. Glassware is cleaned and properly stored
- D. All spills are cleaned.

One of the most important safety precautions in the laboratory is to clean and pickup on a continuing bases. This includes:

- A. Cleaning up spills immediately
- B. Cleaning and putting away glassware, test equipment, and laboratory equipment immediately after each use.

EVERYONE'S COOPERATION IS EXPECTED!

A CLEAN LABORATORY IS THE FIRST STEP TO A SAFE LABORATORY!

XVI. RECORDKEEPING

Accident records are written and retained by the Supervisors.

Inventory and usage records for high-risk substances are maintained by the Assistant General Manager.

Medical consultation records are maintained by the Assistant General Manager.

Training attendance records are maintained by the Assistant General Manager.

All records are kept, transferred and made available in accordance with 29 CFR 1910.20.

XVII. REFERENCES

The following references were used to assist in the preparation of this plan:

1. U.S.Department of Labor, final rule part II. Federal Register 29 CFR Part 1910. Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.
2. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, 1981.
3. National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, 1983.
4. Laboratory Safety Policy for Great Salt Bay Sanitary District, Northern General Services
Freeport, ME
5. Maine Wastewater Control Association - Laboratory
Committee: Mary Smith, Sue Romatzick, Janet Abrahamson, Gerry Kamke,
Phyllis Rand, Tom Hambrock, Tom Bouchard.
6. Raymond Lussier, Life Safety Consultants of New
England.
7. J.D. Warren, Maine Department of Labor, Bureau of
Labor Standards.

XVIII. APPENDICES

A. DOT Hazard Classification List

B. EPA Hazard Classification List

C. Target Organs

D. Chemical Storage Codes

APPENDIX A

DOT HAZARD CLASSIFICATION LIST

(Reference Title 49 Code of Federal Regulations)

Hazard Classifications	Label Name
1.1	Explosive 1.1
1.2	Explosive 1.2
1.3	Explosive 1.3
1.4	Explosive 1.4
1.5	Explosive 1.5
1.6	Explosive 1.6
2.1	Flammable Gas
2.2	Non-flammable Gas
2.3	Poison Gas
3 (flammable liquid)	Flammable Liquid
Combustible liquid	(none)
4.1	Flammable Solid
4.2	Spontaneously Combustible
4.3	Dangerous When Wet
5.1	Oxidizer
5.2	Organic Peroxide
6.1 (Packing Groups I and II)	Poison
6.1 (Packing Group III)	Keep Away From Food
6.2	Infectious Substance 1
7 (ref. 49 CFR sect. 172.403)	Radioactive White-I
7	Radioactive Yellow-II
7	Radioactive Yellow-III
7 (empty packages, 49 CFR sect. 173.427)	Empty
8	Corrosive
9	Class 9

The ETIOLOGIC AGENT label specified in regulations of the Department of Health and Human Services at 42 CFR 72.3 may apply to packages of infectious substances.

APPENDIX B

EPA HAZARD CLASSIFICATION LIST

1. IGNITABLE WASTE- Flash point > 140F
Flammable solids (4.1)
Oxidizers (5.1)
Flammable gases (2.1)
Some combustible liquids
Flammable liquids (3)
Pyrophoric liquids
2. CORROSIVES- Any liquid having a pH less than or equal to 2 or greater than 12.5 (8)
3. REACTIVE- Explosives A, B, or C (1.1,1.2,1.3,
1.4,1.5,1.6)
Water reactive (4.3)
Cyanide or sulfide
Organic peroxides (5.2)
Poison B (6.1)
4. EXTRACTION PROCEDURE TCLP

Volatiles:

Benzene	Carbon Tetrachloride
Chlorobenzene	Chloroform
1,1-Dichloroethene	Methyl Ethyl Ketone
Vinyl Chloride	

Herbicides:

2,4-Dichlorophenoxyacetic acid (2.4-D)
2,4,5-Trichlorophenoxypropionic acid (Silvex)

Semi-Volatiles/Pesticides:

m-Cresol	o-Cresol
p-Cresol	1,4-Dichlorobenzene
2,4-Dinitrotoluene	Hexachlorobutadiene
Hexachlorobenzene	Hexachloroethane
Nitrobenzene	Pentachlorophenol
2,4,5-Trichlorophenol	2,4,6Trichlorophenol
Chlordane	Endrin
Heptachlor	Lindane
Methoxychlor	Toxaphene

Metals:

Arsenic	Barium
Cadmium	Chromium
Lead	Mercury
Selenium	Silver

NOTE: Numerals in parentheses indicate chemical categories on the DOT list.

APPENDIX C**TARGET ORGANS****HEPATOTOXINS**

Signs and Symptoms
Chemicals

Chemicals that produce liver damage
Jaundice; liver enlargement
Carbon tetrachloride; nitrosamines

NEPHROTOXINS

Signs and Symptoms
Chemicals

Chemicals that produce kidney damage
Edema; proteinuria
Halogenated hydrocarbons; uranium

NEUROTOXINS

Signs and Symptoms
Chemicals

Chemicals that produce their primary toxic effects on the nervous system
Narcosis; behavioral changes; decrease in motor functions
Mercury; carbon disulfide

AGENTS THAT ACT ON THE BLOOD OR HEMATOPOIETIC SYSTEM

Signs and Symptoms
Chemicals

Decrease hemoglobin function; deprive body tissues of oxygen
Cyanosis; loss of consciousness
Carbon monoxide; cyanides

AGENTS THAT DAMAGE THE LUNG

Signs and Symptoms
breath
Chemicals

Chemicals that irritate or damage the pulmonary tissue
Cough; tightness in chest; shortness of
Silica; asbestos

REPRODUCTIVE TOXINS

Signs and Symptoms
Chemicals

Chemicals that affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis)
Birth defects; sterility
Lead

CUTANEOUS HAZARDS

Signs and Symptoms
Chemicals

Chemicals that affect the dermal layer of the body
Defatting of the skin; rashes; irritation
Ketones; chlorinated compounds

EYE HAZARDS

Signs and Symptoms
Chemicals

Chemicals that affect the eye or visual capacity
Conjunctivitis; corneal damage
Organic solvents; acids

APPENDIX D

CHEMICAL STORAGE CODES

Orange - minimal or no hazard, general storage

Green - minimal or no hazard, general storage

Yellow - reactivity hazard, keep separate from flammables and combustibles

White - contact hazard, store in corrosives area

Gray Stripe - incompatible substance, store separately

Blue - poison