

WRITTEN HAZARD COMMUNICATION PROGRAM

TOWN OF CLAYTON

I. General:

The purpose of this instruction is to ensure that the Town of Clayton is in compliance with the OSHA Hazard Communication Standard (HCS) 29CFR1910.1200.

The Occupational Safety and Health Manager (OSHM) is the coordinator of the facility program and shall be the same person as the Safety Officer, acting as the representative of the Town of Clayton Departments, who has overall responsibility.

In general, each employee in the facility will be appraised of the substance of the HCS, the hazardous properties of chemicals they work with, and measures to take to protect themselves from these chemicals.

II. List of Hazardous Chemicals:

The OSHM will maintain a list of all hazardous chemicals used in the facility, and update the list as necessary. The hazardous chemical list will be updated upon receipt of hazardous chemicals at the facility. The list of hazardous chemicals is maintained at the Town of Clayton Highway Department Office and the Town Supervisor's Office.

III. Material Safety Data Sheets (MSDS):

The OSHM will maintain an MSDS library on every substance on the list of hazardous chemicals in the workplace. The MSDS will consist of a fully completed OSHA Form 174 or equivalent. MSDS will be readily available to all employees.

The OSHM is responsible for acquiring and updating MSDS. The OSHM will review each MSDS for accuracy and completeness. All new procurements for the facility must be cleared by the OSHM. Whenever possible, the least hazardous substance will be procured.

MSDS that meet the requirements of the HCS must be fully completed and received at the facility prior to, or at the time of receipt of the first shipment of any potentially hazardous chemical purchased from a vendor. It may be necessary to discontinue procurements from vendors failing to provide approved MSDS in a timely manner.

IV. Labels and other Forms of Warning:

OSHM is designated to ensure that all hazardous chemicals in the facility are properly labeled. Labels should list at least the chemical identity, appropriate

hazard warnings, and the name and address of manufacturer, importer or other responsible party. The OSHM will refer to the importer or other responsible party. The OSHM will refer to the corresponding MSDS to verify label information. Immediate use containers, small containers into which materials are drawn for use on the shift by the employee drawing the materials, do not require labeling. To meet the labeling requirements of HCS for other in-house containers, refer to the label supplied by the manufacturer. All labels for in-house containers will be approved by the OSHM prior to their use.

The OSHM will check on a monthly basis to ensure that all containers in the facility are labeled and the labels are up-to-date.

V. Training:

Each employee who works with or is potentially exposed to hazardous chemicals will receive initial training on the HCS and the safe use of those hazardous chemicals. Additional training will be provided for employees whenever a new hazard is introduced into their work areas. Hazardous chemical training is conducted by the Town HR Office. A copy of course outline, PY training schedules, and description of course materials are maintained for each year.

The training will emphasize these elements:

- A summary of the standard and this written program;
- Hazardous chemical properties including visual appearance and odor and methods that can be used to detect the presence or releases of hazardous chemicals;
- Physical and health hazards associated with potential exposure to workplace chemicals;
- Procedures to protect against hazards, e.g., personal protective equipment, work practices, and emergency procedures;
- Hazardous chemical spill and leak procedures; and
- Where MSDS are located, how to understand their content, and how employees may obtain and use appropriate hazard information.

The OSHM will monitor and maintain records of employee training and advise the facility manager on training needs. **NOTE:** NYS Right-To-Know Law requires annual training of employees.

VI. Contractor Employers:

The OSHM, upon notification will advise outside contractors of any chemical hazards which may be encountered in the normal course of their work on the premises. Contractors will be asked about chemical hazards which may occur from the hazardous materials that they may use in the workplace.

VII. Non-Routine Tasks:

Personnel contemplating a non-routine task, e.g., boiler repair, will consult with the OSHM and will ensure that employees are informed of any chemical hazards associated with the performance of these tasks, and appropriate protective measures. This will be accomplished by meeting of supervisors and the OSHM with affected employees before such work is done.

VIII. Additional Information:

Further information on this program, the Hazard Communication Standard, State Right-To-Know Law, and applicable MSDS is available from the Highway Superintendent, phone number 315-686-5122 or the HR Office, phone number 315-686-3512.

HAZARDOUS MATERIAL INCIDENT PROCEDURES

For Employees who could Encounter Hazardous Material Incidents during performance of their Routine Duties: (Not for Emergency Responders).

I. When a Hazardous Materials Incident has been identified by Town of Clayton personnel, these personnel will secure the scene, but will stay away from the immediate accident site and will not become involved in rescue or mitigation. The appropriate Fire Service agency will be immediately notified via radio or phone.

II. In the event that Town of Clayton personnel must temporarily take charge of an incident, Incident Command will be transferred to a Fire Service Officer, Environmental Officer, or other appropriate agency as soon as is practical.

III. Town of Clayton personnel will confine their activities to those described herein, and will not engage in activities outside of the scope of their training.

IV. The policy for Town of Clayton personnel when confronted with a hazardous materials incident is to:

- A. Attempt to safely assess hazards that are present in the situation whenever possible, keeping in mind the personal safety of department personnel, as well as the safety of others who may be present.
- B. Immediately report the situation to the dispatcher and request that the local Fire Department and Police agency be notified.
- C. Implement traffic and crowd control procedures when necessary.
- D. Carry out an evacuation of the immediate area if the situation is too critical to await emergency services personnel.

Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*

Section 13, Disposal considerations*

Section 14, Transport information*

Section 15, Regulatory information*










Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.

See Appendix D of 1910.1200 for a detailed description of SDS contents.

Pictograms

<p>Health Hazard</p>  <ul style="list-style-type: none"> ▪ Carcinogen ▪ Mutagenicity ▪ Reproductive Toxicity ▪ Respiratory Sensitizer ▪ Target Organ Toxicity ▪ Aspiration Toxicity 	<p>Flame</p>  <ul style="list-style-type: none"> ▪ Flammables ▪ Pyrophorics ▪ Self-Heating ▪ Emits Flammable Gas ▪ Self-Reactives ▪ Organic Peroxides 	<p>Exclamation Mark</p>  <ul style="list-style-type: none"> ▪ Irritant (skin and eye) ▪ Skin Sensitizer ▪ Acute Toxicity ▪ Narcotic Effects ▪ Respiratory Tract Irritant ▪ Hazardous to Ozone Layer (Non-Mandatory)
<p>Gas Cylinder</p>  <ul style="list-style-type: none"> ▪ Gases Under Pressure 	<p>Corrosion</p>  <ul style="list-style-type: none"> ▪ Skin Corrosion/Burns ▪ Eye Damage ▪ Corrosive to Metals 	<p>Exploding Bomb</p>  <ul style="list-style-type: none"> ▪ Explosives ▪ Self-Reactives ▪ Organic Peroxides
<p>Flame Over Circle</p>  <ul style="list-style-type: none"> ▪ Oxidizers 	<p>Environment (Non-Mandatory)</p>  <ul style="list-style-type: none"> ▪ Aquatic Toxicity 	<p>Skull and Crossbones</p>  <ul style="list-style-type: none"> ▪ Acute Toxicity (fatal or toxic)

Sample Label

Product Identifier

CODE _____

Product Name _____

Supplier Identification

Company Name _____

Street Address _____

City _____ State _____

Postal Code _____ Country _____

Emergency Phone Number _____

Precautionary Statements

Keep container tightly closed. Store in cool, well ventilated place that is locked.

Keep away from heat/sparks/open flame. No smoking.

Only use non-sparking tools.

Use explosion-proof electrical equipment.

Take precautionary measure against static discharge.

Ground and bond container and receiving equipment.

Do not breathe vapors.

Wear Protective gloves.

Do not eat, drink or smoke when using this product.

Wash hands thoroughly after handling.

Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon dioxide (CO₂) fire extinguisher to extinguish.

First Aid

If exposed call Poison Center.

If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.

Hazard Pictograms



Signal Word

Danger

Hazard Statement

Highly flammable liquid and vapor.

May cause liver and kidney damage.

Supplemental Information

Directions for use

Fill weight: _____ Lot Number _____

Gross weight: _____ Fill Date: _____

Expiration Date: _____

Appendix A

SUGGESTED LABEL/TRAINING CONTENT

PAINTING & COATING

- May cause irritation of skin, eyes, nose and throat
- May cause headache, nausea and dizziness
- May cause nervous system disorders
- May be reproductive hazard
- May cause allergic sensitization of skin/respiratory tract
- Some materials may be carcinogenic
- Very high levels may cause unconsciousness and death
- These materials can be flammable or highly flammable

COMPRESSED GASES

- Vessel rupture may result in a missile reaction
- Concentrated streams may cause skin rupture and body damage
- May result in toxic effects specific to each gas
- May cause asphyxiation in confined spaces

CARBON MONOXIDE

- May cause dizziness, nausea or a headache
- Excessive exposure may cause unconsciousness and death
- May aggravate heart and artery diseases

WOOD DUST

Short Term Exposure may cause:

- Irritation of eyes, nose, throat & lungs
- Allergies

Long term Exposure may cause:

- Accumulation in lungs
- Cancer (Hardwood)
- Asthma and related problems (Hardwood)

WELDING

- Fumes and gases may cause irritation of the eyes, nose and throat
- Fumes and gases may cause chest pain/pulmonary edema
- Fumes and gases may cause chronic lung diseases/lung cancer
- Fumes and gases may cause metal fume fever/lead poisoning
- Polyester and other man-made fibers may melt and cause severe burns if struck by a welding spark
- May result in asphyxiation in confined spaces

GENERAL EFFECTS OF CHEMICALS

Short term (acute) effects may include:

Burns from flammable materials
Eyes, nose, throat, lung irritation or injury
Dry skin or dermatitis
Nausea (sick feeling)
Vomiting
Fever
Nervous system effects (i.e., dizziness, headache, highs)
Unconsciousness
Death

Long Term (chronic) effects may include:

Damage to liver, kidney, stomach, central nervous system, muscles, brain, blood, bones and lungs
Sensitization
Cancer
Birth defects
Reproductive effects
Death

Appendix A
SUGGESTED LABEL/TRAINING CONTENT

ORGANIC SOLVENTS

Short term exposure may cause:

Low Levels -

- Irritation of eye, nose and throat
- Skin irritation/disease
- Headache, nausea, or light-headedness

High Levels -

- Unconsciousness or coma
- Sudden collapse
- Death

Long term exposure may cause these additional problems:

- Nervous system damage
- Blood disorders
- Permanent eye damage/blindness

HALOGENATED SOLVENTS AND VAPOR DEGREASERS

Short term exposure may cause:

Low levels -

- Irritation of eyes, nose and throat
- Skin irritation/disease
- Headache, nausea or light-headedness

High Levels -

- Dizziness, drowsiness
- Unconsciousness
- Death

Long term exposure may cause these additional problems:

- Permanent nervous systems damage
- * Some of these materials may be carcinogenic
- High exposure to heat or flames may release toxic gases

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

- PAH may be contained in coal tar pitch products, asphalt products, untreated oils and greases, byproducts of overheating and burning hydrocarbon oils and emissions from coke ovens
- May cause skin and eye irritation
- Can cause skin and lung cancer
- * Some of these materials may be carcinogenic
- * Exposed skin should be kept out of sunlight (sunlight worsens effect)

LEAD

May cause:

Lower Levels -

- Headache
- Joint and muscle pain
- Abdominal cramping

High Levels -

- Anemia
- Kidney disease
- Damage to nervous system

Very High Levels -

- Seizures - coma - death
- May be reproductive hazard

SILICA

- May cause silicosis (scarring of the lungs)
- May cause lung cancer
- * Exposure is usually associated with inhalation of silica dust particles

ASBESTOS & FIBERGLASS

- May cause cancer of lung and digestive tract/throat, kidney
- May cause asbestosis/scarring of the lungs
- May cause skin irritation
- * Exposure is usually associated with inhalation of fibers

METALWORKING FLUIDS

- May cause skin, eye, nose, and throat irritation
- May cause skin rash, red eyes, cough or sneezing and respiratory problems
- May cause bacterial infections
- Some materials may be carcinogenic
- May cause skin, colon and stomach cancer

DIISOCYANATES

- May cause irritation of the eyes, skin, nose and throat
- May cause allergic breathing problems
- Allergic sensitization may occur
- Some of these materials may be carcinogenic

Appendix A
SUGGESTED LABEL/TRAINING CONTENT

CAUSTICS & ACIDS

- Skin contact may cause severe burns/delayed burns/skin ulcers
- Eye exposure causes blindness
- Inhalation may cause respiratory problems, nasal damage
- Ingestion may burn throat and stomach
- Chromic acid may be carcinogenic
- * These materials are highly reactive. Improper mixing may cause fire or explosions.

ADHESIVES

- May cause irritation of eye, nose, throat and lungs
- May cause skin rash and allergic reactions
- May cause respiratory allergies
- Liquid resins may contain flammable solvents
- Glycidyl ethers are a possible carcinogenic.
- Allergic sensitization may occur

PLASTICS & POLYMERS

- May cause skin rash and respiratory irritation
- May use skin and respiratory allergies
- May cause eye irritation
- These problems may occur from direct contact or through dust or vapors in the air
- * Burning or heating may produce hazardous vapors or smoke.
- Allergic sensitization may occur

GLYCOL ETHERS & ACETATES

- Can pass directly through the skin into blood stream
- May be reproductive hazard
- May cause kidney injury
- May cause blood disorders/anemia
- May cause headaches and drowsiness
- * These compounds do not have strong odors and cannot be detected by smell at hazardous levels.

ALDEHYDES, AMINES & AMIDES

- May cause irritation or burns of the skin, eyes, nose, throat, and lungs
- May cause allergic reactions
- May cause nervous system or internal organ damage
- Allergic sensitization may occur
- * Some of these chemicals are easily absorbed through the skin.

DICTIONARY

OF TERMS USED ON
MSDSs AND LABELs

AAP - Asbestos Action Program.

ABATEMENT - Reducing the degree or intensity of, or eliminating, pollution.

ABSOLUTE - Free from imperfection; free or relatively free from mixture.

ABSORB - To take in, suck up, especially a solid taking in a liquid, as a sponge takes in water.

ABSORPTION - The passage of one substance into or through another; e.g., an operation in which one or more soluble components of a gas mixture are dissolved in a liquid.

AC - Alternating Current.

ACA - American Conservation Association.

ACBM - Asbestos-Containing Building Material.

ACCLIMATIZATION - The physiological and behavioral adjustments of an organism to changes in its environment.

ACFM - Actual Cubic Feet Per Minute.

ACGIH - See American Conference of Governmental Industrial Hygienists.

ACH - See air changes per hour.

ACID - A chemical compound that yields hydrogen ions when dissolved in water; whose hydrogen can be replaced by metals or basic radicals; or which reacts with bases to form salt and water (neutralization).

ACIDOSIS - An abnormal condition characterized by reduced alkalinity of the blood and of the body tissues.

ACL - Alternate Concentration Limit.

ACL - Analytical Chemistry Laboratory.

ACS - American Chemical Society.

ACTION LEVELS - Levels of exposure at which OSHA regulations for protective programs must be put into effect.

ACUTE EFFECT - Adverse effect on a human or animal which has severe symptoms developing rapidly and coming quickly to a crisis. Also see "chronic effect."

ACUTE EXPOSURE - A single exposure to a toxic substance that results in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day.

ACUTE TOXICITY - Acute effects resulting from a single dose of or exposure to a substance. Ordinarily used to denote effects in experimental animals.

ACGIH - American Conference of Governmental Industrial Hygienists is an organization of professional personnel in governmental agencies or educational institutions who are employed in occupational safety and health programs.

ADENOSIS - Any disease of a gland.

ADHESION - A union of two surfaces that are normally separate.

ADI - Acceptable Daily Intake.

ADMINISTRATIVE CONTROLS - Use of information, training, shift schedules, work practices, housekeeping, and monitoring to reduce or eliminate exposures.

ADSORB - To adhere in an extremely thin layer of molecules (as of gases, solutes, or liquids) to the surfaces of solid bodies or liquids with which they are in contact.

ADULTERANTS - Chemical impurities or substances that by law do not belong in a food, or in a pesticide.

AEROSOL - A solid or liquid particulate, natural or manmade, that can remain suspended in air. Paint spray and smoke are examples of aerosols.

AHERA - Asbestos Hazard Emergency Response Act.

AICE - American Institute of Chemical Engineers.

AIHC - American Industrial Health Council.

AIP - Auto Ignition Point.

AIRBORNE - Word used to describe something that is in the air.

AIR CHANGES PER HOUR (ACH) - The movement of a volume of air in a given period of time; if a house has one air change per hour, it means that all of the air in the house will be replaced in a one-hour period.

AIR CONTAMINANT - Any particulate matter, gas, or combination thereof, other than water vapor or natural air.

AIR LINE RESPIRATOR -A respirator that is connected to a compressed breathing air source by a hose of small inside diameter. The air is delivered continuously or intermittently in a sufficient volume to meet the wearer's breathing requirements.

AIR-PURIFYING RESPIRATOR - Type of personal protective equipment that uses a special filter or chemical cartridge to remove specific airborne hazards from contaminated air before the wearer inhales it.

AIR-SUPPLIED RESPIRATOR - Type of personal protective equipment that supplies the air that the wearer breathes; includes self-contained breathing apparatus and hose-type supplied-air units.

AL - Acceptable Level.

ALA - American Lung Association.

ALARA - As Low As Reasonably Achievable.

ALJ - Administrative Law Judge.

ALK - An abbreviation for alkali.

ALKALI - Any chemical substance which forms soluble soaps with fatty acids. Alkalis are also referred to as bases. They may cause severe burns to the skin. Alkalis turn litmus paper blue and have pH values from 8 to 14.

ALLERGIC REACTION - An abnormal physiological response to a chemical or physical stimuli by a sensitive person.

ALOPECIA - Hair loss.

ALR - Action leakage Rate.

ALR - An abbreviation for allergenic effects.

AMA - American Medical Association.

AMBIENT - An encompassing atmosphere.

ANALGESIA - Insensibility to pain without loss of consciousness.

ANESTHESIA - Loss of sensation with or without loss of consciousness.

ANESTHETIC - A chemical that causes a total or partial loss of sensation. Overexposure to anesthetics can cause impaired judgment, dizziness, drowsiness, headache, unconsciousness, and even death. Examples include: alcohol, paint remover, and degreasers.

ANHYDRIDE - A compound derived from another (as an acid) by removal of the elements of water.

ANHYDROUS - Free from water and especially water of crystallization.

ANNUAL REPORT ON CARCINOGENS - A list of substances that are either known or anticipated to be carcinogens; published by the National Toxicology Program (NTP). The most recent edition is available from National Technical Information Service (NTIS), US Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161, 703-487-4600.

ANOREXIA - Loss of appetite especially when prolonged.

ANOSMIA - Loss or impairment of the sense of smell.

ANOXIA - A deficiency of oxygen reaching the tissues of the body, especially of such severity as to result in permanent damage, See also hypoxia.

ANSI - American National Standards Institute is a privately funded, voluntary membership organization that identifies industrial and public needs for national consensus standards and coordinates development of such standards.

ANTIBODIES - Proteins produced in the body by immune system cells in response to antigens, and capable of combining with antigens.

ANTIDOTE - A remedy to relieve, prevent, or counteract the affects of a poison.

ANTIGEN - A substance that causes production of antibodies when introduced into animal or human tissue.

AO - Area Office.

APHA - American Public Health Association.

API - American Petroleum Institute.

APPEARANCE - A description of a substance at normal room temperature and normal atmospheric conditions. Appearance includes the color, size, and consistency of a material.

APT - Associated Pharmacists and Toxicologists.

AQUATIC TOXICITY - The adverse effects to marine life that result from being exposed to a toxic substance.

AQUEOUS - Of, relating to, or resembling water.

ARBITRATION - A process for the resolution of disputes. Decisions are made by an impartial arbitrator selected by the parties. These decisions are usually legally binding. See also mediation.

ARGYRIA - Poisoning by silver or its compounds.

ARTICLE (OSHA) - "..... a manufactured item: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use".

ASBESTOS - A mineral fiber that can pollute air or water and cause cancer or asbestosis when inhaled. EPA has banned or severely restricted its use in manufacturing and construction.

ASBESTOSIS - A disease associated with chronic exposure to and inhalation of asbestos fibers. The disease makes breathing progressively more difficult and can lead to death.

A-SCALE SOUND LEVEL - A measure of sound approximating the sensitivity of the human ear, used to note the intensity or annoyance of sounds.

ASH - The mineral content of a product remaining after complete combustion.

ASPHYXIAN - A chemical, usually in a gas or vapor state, that displaces oxygen or prevents its use in the body by other chemical means.

ASPHYXIATION - The state of unconsciousness or death through lack of adequate oxygen, presence of noxious agents, or other obstruction to normal breathing.

ASSISTANT SECRETARY (OSHA) - The Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of labor, or designee. The assistant secretary may request to review MSDSs, the written hazard communication program, and written hazard determination procedures.

ASTHMA - A condition often of allergic origin that is marked by continuous or paroxysmal labored breathing accompanied by wheezing, by a sense of constriction in the chest, and often attacks of coughing or gasping.

ASTM - American Society for Testing and Materials is the world's largest source of voluntary consensus standards for materials, products, systems, and services. ASTM is a resource for sampling and testing methods, health and safety aspects of materials, safe performance guidelines, effects of physical and biological agents and chemicals.

ASYMPTOMATIC - Showing no symptoms.

ATM - Atmosphere, a unit of pressure equal to 760 mmHg at sea level.

ATMOSPHERE SUPPLYING RESPIRATOR - A respirator that provides breathing air from a source independent of the surrounding atmosphere. There are two types: air line and self-contained breathing apparatus.

ATOMIZE - To divide a liquid into extremely minute particles, either by impact with a jet of steam or compressed air, or by passage through some mechanical device.

AUTO-IGNITION TEMPERATURE - The temperature to which a closed, or nearly closed container must be heated in order that the flammable liquid, when introduced into the container, will ignite spontaneously or burn.

BARRIER COATING(S) - A layer of material that acts to obstruct or prevent passage of something through a surface that is to be protected, e.g., grout, caulk, or various sealing compounds.

BARRIER CREAM - Protective cream applied to the skin to protect against skin contact/absorption hazards; often used in addition to gloves.

BASE - A compound that yields hydroxyl ions in aqueous solutions; and which reacts with an acid to form water and a salt.

BENIGN - Not recurrent or not tending to progress.

BERYLLIUM - An airborne metal that can be hazardous to human health when inhaled. It is discharged by machine shops, ceramic and propellant plants, and foundries.

BETA PARTICLE - An elementary particle emitted by radioactive decay, that may cause skin burns. It is halted by a thin sheet of paper.

BIODEGRADABLE - Capable of being broken down into innocuous products by the action of living things.

BIOPSY - Removal and examination of tissue from the living body.

BLASTING AGENT (OSHA) - "any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined." See also flammable solid.

BLD - An abbreviation for blood effects.

BLOOD AGENTS - Chemicals such as carbon monoxide and the cyanides that act on the blood and the hematopoietic system and ultimately result in depriving body tissues of adequate oxygen. See also hematopoietic system.

BLS - Bureau of Labor Statistics.

BOILING POINT - Temperature at which a liquid changes into a gas.

BOM - Bureau of Mines.

BONDING - The electrical connection of two objects to equalize electrical potential and therefore prevent sparks.

BRONCHITIS - Inflammation of the bronchial tubes.

BTU - British Thermal Unit.

BULK DENSITY - Mass of powdered or granulated solid material per unit of volume.

BY-PRODUCT - Material, other than the principal product, that is generated as a consequence of an industrial process.

C - Celsius, Centigrade, a unit of temperature.

"C", OR CEILING - The maximum allowable human exposure limit for an airborne substance which is not to be exceeded even momentarily. Also see "PEL" and "TLV".

ca - Approximately.

CAA - Clean Air Act.

CADMIUM (CD) - A heavy metal element that accumulates in the environment.

CAER - Community Awareness and Emergency Response.

CAMP - Continuous Air Monitoring Program.

CAR, CARC - An abbreviation for carcinogenic.

CARBON DIOXIDE (CO₂) - A colorless, odorless, nonpoisonous gas, which results from fossil fuel combustion and is normally a part of the ambient air.

CARBON MONOXIDE (CO) - A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

CARCINOGEN - Health hazard that causes cancer in the exposed individual.

CARCINOGENIC - Cancer-producing.

CARCINOGENICITY - The ability to produce cancer.

CARCINOMA - A malignant tumor or cancer.

CAS - Center for Automotive Safety, Chemical Abstract Service

CAS NUMBER - An identification number assigned by the Chemical Abstracts Service (CAS) of the American Chemical Society. The CAS Number is used in various databases, including Chemical Abstracts, for identification and information retrieval.

CATALYST - A chemical that changes the rate of a chemical reaction between two other chemicals without affecting the chemical itself. See also reactivity.

CATHODIC PROTECTION - A technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell.

CAUSTIC - Capable of destroying or eating away by chemical action; corrosive.

CAUSTIC SODA - Sodium hydroxide, a strong alkaline substance used as the cleaning agent in some detergents.

cc - Cubic Centimeter.

CDC - Centers for Disease Control (HHS).

CELSIUS (C) - Degrees of temperature. 0 degrees C equals 32 degrees F, which is the freezing point of water. 100 degrees C equals 212 degrees F, which is the boiling point of water. Convert as follows: $F \text{ degrees} = (C \text{ degrees} \times 1.8) + 32$.
 $C \text{ degrees} = (F \text{ degrees} - 32) \times 5/9$. See also Fahrenheit.

CENTRAL NERVOUS SYSTEM - The brain and spinal cord. These organs supervise and coordinate the activity of the entire nervous system. Sensory impulses are transmitted into the central nervous system, and motor impulses are transmitted out.

CEO - Chief executive Officer.

CENTIMETER (cm) - A unit of metrical measure. One cm equals 1/100 meter.

CENTIPOISE - A unit of viscosity or fluidity.

CEPP - Chemical Emergency Preparedness Plan.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

CESIUM (Cs) - A silver-white, soft ductile element of the alkali metal group that is the most electropositive element known. Used especially in photoelectric cells.

CFM - Chlorofluoromethanes.

CFR 29 SECTION 1910.1200. - The federal OSHA regulations dealing with the Hazard Communication Standard.

CFR SECTION 1910 SUBPART Z - The section of OSHA regulations addressing Toxic and Hazardous Substances.

CFS - Cubic feet per second.

CHEMICAL (OSHA) - "Any element, chemical compound, or mixture of elements and/or compounds".

CHEMICAL CARTRIDGE RESPIRATOR - A respirator that uses various chemical substances to purify inhaled air of certain gases and vapors. This type respirator is effective for concentrations no more than ten times the TLV of the contaminant, if the contaminant has warning properties (odor or irritation) below the TLV.

CHEMICAL CONTAINER - Bags, barrels, bottles, boxes, cans, cylinders, drums, reaction vessels, storage tanks, and other vessels used to hold chemicals.

CHEMICAL FORMULA - Way of identifying chemical materials by showing the number of each type of atom contained in one molecule of the chemical.

CHEMICAL HAZARD - Any chemical material that can cause health problems, fire, explosion, or other dangerous situations.

CHEMICAL INVENTORY - A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas).

CHEMICAL NAME - The name given to a chemical in the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS).

CHEMICAL-PROTECTIVE CLOTHING (CPC) - Special clothing that may be resistant to permeation, penetration, or degradation by a chemical. Rubber boots, gloves, aprons, and suits are commonly used to protect workers from exposure to hazardous chemicals.

CHEMICAL SOURCE - The arrangement within the molecule of atoms and their chemical bonds.

CHEMTREC - Chemical Transportation Emergency Center is a national center established by the Chemical Manufacturers Association (CMA) to relay pertinent emergency information concerning specific chemicals on requests from individuals. CHEMTREC has a 24-hour toll-free telephone number (800-424-9300) to help respond to chemical transportation emergencies.

CHILLING EFFECT - The lowering of the Earth's temperature because of increased particles in the air blocking the sun's rays. See also greenhouse effect.

CHIP - Chemical Hazard Information Profile.

CHLORINATED HYDROCARBONS - Include a class of persistent, broad-spectrum insecticides that linger in the environment and accumulate in the food chain. Among them are DDT, aldrin, dieldrin, heptachlor, chlordane, lindane, endrin, mirex, hexachloride, and toxaphene. Other examples include TCE, used as an industrial solvent.

CHLORINATED SOLVENT - An organic solvent containing chlorine atoms, e.g., methylene chloride and 1,1,1-trichloromethane, which are used in aerosol spray containers and in traffic paint.

CHLORINATION - The application of chlorine to drinking water, sewage, or industrial waste to disinfect or to oxidize undesirable compounds.

CHLOROFLUOROCARBONS (CFCs) - A family of inert, nontoxic, and easily liquified chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere, they drift into the upper atmosphere where their chlorine components destroy ozone.

CHROMIUM - See heavy metals.

CHRONIC - An adverse effect on the human body with symptoms that develop slowly over a long period of time or that frequently recur. Chronic effects are the result of long-term exposure and are of long duration.

CHRONIC EFFECT - An adverse effect on a human or animal body, with symptoms which develop slowly over a long period of time or which recur frequently. Also see "acute".

CHRONIC EXPOSURE - Long-term contact with a substance.

CHRONIC TOXICITY - The capacity of a substance to cause long-term poisonous human health effect. See also acute toxicity; toxicity.

CI - Compression Ignition.

CICIS - Chemicals in Commerce Information System.

CIS - Chemical Information System.

CLEAN AIR ACT (CAA) - was enacted to regulate/reduce air pollution. CAA is administered by EPA.

CLEAN WATER ACT - Federal law enacted to regulate/reduce water pollution. CWA is administered by EPA.

CLOSED CUP (cc) - A method used in flash point testing.

CMA - Chemical Manufacturers Association.

CO - Carbon monoxide.

CO₂ - Carbon dioxide.

COC - Cleveland Open Cup is a flash point test method.

CODE OF FEDERAL REGULATIONS (CFR) - The collection of rules and regulations originally published in the Federal Register by various government departments and agencies. OSHA regulations are found in 29 CFR; EPA regulations are in 40 CFR; and Department of Transportation regulations in 49 CFR.

COMBUSTIBLE - A term used by NFPA, DOT and others to classify certain liquids that will burn, on the basis of flash points. Both NFPA and DOT generally define "combustible liquids" as having a flash point of 100 degrees F. (37.8 degrees C) or higher but below 200 degrees F (93.3 degrees C). Also see "flammable." Nonliquid substances such as wood and paper are classified as "ordinary combustibles" by NFPA.

COMBUSTIBLE LIQUID - Liquid having a flash point at or above 100 degrees F, but below 200 degrees F.

COMBUSTION - The process of burning.

COMMON NAME - Any identification, such as code name, code number, trade name, brand name, or generic name, other than its chemical name, used to identify a chemical.

COMPLIANCE - The state of meeting all the requirements of the law.

COMPRESSED GAS - Gas stored inside a container at a pressure much higher than normal air pressure; contains a lot of stored energy; a physical hazard due to the potential for sudden release of the stored energy when the gas expands.

CONC - Concentration.

CONCENTRATION - The relative amount of a substance when combined or mixed with other substances. Examples: 2 ppm hydrogen sulfide in air, or a 50 percent caustic solution.

CONDENSATION - Process by which an airborne vapor becomes a mist or fume.

CONDITIONS TO AVOID - Conditions encountered during handling or storage which could cause a substance to become unstable.

CONFINED SPACE - Any area which has limited openings for entry and exit that would make escape difficult in an emergency, has a lack of ventilation, contains known and potential hazards, and is not intended nor designated for continuous human occupancy.

CONJUNCTIVITIS - Inflammation of the conjunctiva, the delicate membrane that lines the eyelids and covers the eyeballs.

CONSUMER PRODUCTS - Consumer products and hazardous substances as defined by the Consumer Product Safety Act are not subject to the labeling requirements of the Hazard Communication Standard when they are regulated under the Consumer Product Safety Act.

CONTAINER - Any bag, barrel, bottle, box, can cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of MSDS or HCS, pipes or piping systems are not considered to be containers.

CONTINGENCY PLAN - A document specifying an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials which threaten human health or the environment.

COOLANT - A liquid or gas used to reduce the heat generated by power production in nuclear reactors, electric generators, various industrial and mechanical processes and automobile engines.

COR - An abbreviation for corrosive.

CORROSION - The dissolving and wearing away of metal caused by a chemical reaction such as between water and the pipes that the water contacts, chemicals touching a metal surface, or contact between two metals.

CORROSIVE - Health hazard that burns on contact, causing visible damage and/or irreversible changes to body tissues; also a physical hazard that can burn through inert materials.

CPC - See chemical-protective clothing.

CPF - Carcinogenic Potency Factor.

CPSC - Consumer Products Safety Commission has responsibility for regulating hazardous materials when they appear in consumer goods. For CPSC purposes, hazards are defined in the Hazardous Substances Act and the Poison Prevention Packaging Act of 1970.

CRYOGENIC - health hazard that freezes body tissues on contact.

CSIN - Chemical Substances Information Network.

CUBIC FEET PER MINUTE (CFM) - A measure of the volume of a substance flowing through air within a fixed period of time. With regard to indoor air, refers to the amount of air, in cubic feet, that is exchanged with indoor air in a minute's time, or an air exchange rate.

CUBIC METER - A cube measuring 1 meter on each side.

CU M, CU M3 - Cubic meter.

CUM - An abbreviation for cumulative effects.

CUTANEOUS HAZARDS (APPENDIX A, 29 CFR 1910.1200) - A chemical that affects the dermal layer of the body by causing rashes, irritation, or defatting of the skin. Examples include ketones and chlorinated compounds.

CUTANEOUS TOXICITY - See "Dermal Toxicity".

CVS - An abbreviation for cardiovascular effects.

CWA - Clean Water Act (aka FWPCA - Federal Water Pollution Control Act).

CWTC - Chemical Waste Transportation Council.

CYST - A sac containing a liquid. Most cysts are harmless.

CYTOLOGY - The scientific study of cells.

dB - See decibel.

DDT - The first chlorinated hydrocarbon insecticide (chemical name: Dichloro-Diphsdyl-Trichloromethane).

DECIBEL (dB) - A unit of sound measurement. In general, a sound doubles in loudness for every increase of 10 decibels.

DECOMPOSITION - Chemical breakdown of a material brought on by some adverse condition.

DECOMPOSITION PRODUCT - Chemical that forms when a material breaks down into simpler molecules; may be hazardous even if the parent material is not.

DEGRADATION - The destructive effect a chemical may have on a piece of chemical-protective clothing. Protective clothing that has been degraded may be partially dissolved, softened, hardened, or completely destroyed. If not destroyed, the material may have reduced strength and flexibility. This may result in easy tearing or punctures, opening up a direct route to skin contact by penetration. See also chemical-protective clothing.

DEGREE OF HAZARD - Measure of how serious an exposure is based on what can happen as a result; takes into account the chemical, exposure route, dosage, number and length of exposures, and individual differences.

DELAYED EFFECT - Health effect that appears slowly over time, rather than right away; can be associated with either single or repeated exposures.

DELIQUESCENT - Tending to melt or dissolve, especially tending to undergo gradual dissolution and liquefaction by the attraction and absorption of moisture from the air.

DENSITY - The mass (weight) per unit volume of a substance. For example, lead is much more dense than aluminum.

DEPRESSANT - A substance that reduces a bodily functional activity or an instinctive desire, such as appetite.

DERMAL - Relating to the skin.

DERMAL TOXICITY - The ability of a pesticide or toxic chemical to poison people or animals by contact with the skin.

DERMATITIS - Inflammation of the skin.

DETERGENT - A synthetic washing agent that helps to remove dirt and oil. Some contain compounds that kill useful bacteria and encourage algae growth when they are in wastewater that reaches receiving waters.

DHHS - U.S. Department of Health and Human Services (replaced US Department of Health, Education and Welfare). NIOSH and the Public Health Service (PHS) are part of DHHS.

DIAPHORESIS - Perspiration, especially, profuse perspiration artificially induced.

DIAZINON - An insecticide.

DIKE - A low wall that can act as a barrier to prevent a spill from spreading.

DILUTION VENTILATION - Air flow designed to dilute contaminants to acceptable levels. Also see general ventilation or exhaust.

DIOXIN - Any of a family of compounds known chemically as dibenzo-p-dioxins. Concern about them arises from their potential toxicity and contaminants in commercial products. Tests on laboratory animals indicate that it is one of the more toxic man-made chemicals known.

DISINFECTANT - A chemical or physical process that kills pathogenic organisms in water. Chlorine is often used to disinfect sewage treatment effluent, water supplies, wells and swimming pools.

DISPERSANT - A chemical agent used to break up concentrations of organic materials such as spilled oil.

DISTILLED SPIRITS - As defined in the Federal Alcohol Administration Act (FAAA), are not subject to the label requirements of the Hazard Communication Standard when they are subject to the labeling requirements of the FAAA.

DNA - Deoxyribonucleic acid, the molecule in which the genetic information for most living cells is encoded. Viruses, too, can contain RNA.

DOC - Department of Commerce.

DOCUMENTATION - The record of compliance that a company should maintain. The Hazard Communication Law requires that certain requirements be met, including employee information and training. Complete training records should be kept to prove compliance in the event of an inspection. Other areas where documentation should be maintained include the written program, MSDS maintenance, hazard determination, and quality assurance audits.

DOD - Department of Defense.

DOE - Department of Energy.

DOI - Department of Interior.

DOJ - Department of Justice.

DOL - US Department of Transportation regulates transportation of chemicals and other substances.

DOS - Department of State.

DOSAGE - Amount of chemical that enters the body over a specified period of time.

DOSE - In radiology, the quantity of energy or radiation absorbed.

DOSIMETER - An instrument that measures exposure to radiation.

DOT - Department of Transportation.

DRY CHEMICAL - A powdered fire extinguishing agent usually composed of sodium bicarbonate, potassium bicarbonate, etc.

DSCF - Dry Standard Cubic Feet.

DSCM - Dry Standard Cubic Meter.

DUST - Airborne particles formed from solids.

ECOLOGY - The relationship of living things to one another and their environment, or the study of such relationships.

EDEMA - An abnormal accumulation of clear watery fluid in the tissues.

EEG - Electroencephalogram.

EENET - Emergency Education Network (FEMA)

EHS - Extremely Hazardous Substance.

ELECTROLYTE - A substance that dissociates into two or more ions, to some extent, in water. Solutions of electrolytes thus conduct the electric current and can be decomposed by it.

EMBOLISM - The sudden obstruction of a blood vessel by an abnormal particle (as an air bubble) circulating in the blood.

EMERGENCY (CHEMICAL) - A situation created by an accidental release or spill of hazardous chemicals that poses a threat to the safety of workers, residents, the environment, or property.

EMETIC - A drug that causes vomiting; used especially in cases of poisoning.

EMI - Emergency Management Institute.

EMPHYSEMA - A condition of the lung marked by abnormal dilation of its air spaces and distension of its walls and frequently by impairment of heart action.

ENDOCRINE GLANDS - Glands that regulate body activity by secreting hormones.

ENGINEERING CONTROLS - use of substitution, isolation, or ventilation to reduce exposure to chemical hazards and the injury or illness caused by such exposure.

ENVIRONMENTAL MONITORING - Type of administrative control that involves collecting, measuring, and analyzing air or wipe samples of chemical substances to determine whether a hazard exists, or whether a known hazard is being effectively controlled.

ENVIRONMENTAL PROTECTION AGENCY (EPA) - Responsible for enforcing regulations related to the Resource Conservation and Recovery Act (RCRA). Toxic Substances Control Act (TSCA), Clean Air Act (CAA), Clean Water Act (CWA), Superfund, and others.

ENVIRONMENTAL RESPONSE TEAM - EPA experts located in Edison, NJ and Cincinnati, OH, who can provide around-the-clock technical assistance to EPA regional offices and states during all types of emergencies involving hazardous waste sites and spills of hazardous substances.

ENVIRONMENTAL TOXICITY - Information obtained as a result of conducting environmental testing designed to study the effects on aquatic and plant life.

EPA - US Environmental Protection Agency.

EPIDEMIC - Widespread outbreak of a disease, or a large number of cases of a disease in a single community or relatively small area.

EPIDEMIOLOGY - Science concerned with the study of disease in a general population. Determination of the incidence (rate of occurrence) and distribution of a particular disease (as by age, sex, or occupation) which may provide information about the cause of the disease.

EPISTAXIS - Hemorrhage from the nose; nosebleed.

EPITHELIUM - The covering of internal and external surfaces of the body.

EQUILIBRIUM - In relation to radiation, the state at which the radioactivity of consecutive elements within a radioactive series is neither increasing nor decreasing.

ERC - Emergency Response Commission.

ERCS - Emergency Response Cleanup Services.

ERNS - Emergency Response Notification System.

ERT - Emergency Response Team.

ERYTHEMA - Abnormal redness of the skin due to capillary congestion.

ESOPHAGUS - Tube that leads from the throat to the stomach.

ETHYLENE DIBROMIDE (EDB) - A chemical used as an agricultural fumigant and in certain industrial processes. Extremely toxic and found to be a carcinogen in laboratory animals, EDB has been banned for most agricultural uses in the United States.

ETIOLOGY - The study of the causes of disease.

EVAPORATE - Process by which liquids change into the vapor form.

EVAPORATION RATE - Physical data on the MSDS that describes how fast a liquid evaporates in comparison to a standard having a rate of 1.

EXPLOSIVE - Chemical material that can undergo a sudden and violent release of pressure and heat.

EXPLOSIVE LIMITS - Data on the MSDS that define the ranges of air-chemical mixtures that can explode when exposed to an ignition source; see Upper and Lower Explosive Limits.

EXPOSED (OSHA) - "means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g., accidental or possible) exposure.

EXPOSURE OR EXPOSED - State of being open and vulnerable to a hazardous chemical in the course of employment by inhalation, ingestion, skin contact, absorption, or any other course; includes potential accidental or possible) exposure.

EXPOSURE LIMIT - The maximum amount of chemical in a given volume of air to which workers may be exposed, as averaged over a specified period of time. Most people can be exposed to this airborne limit for an entire working lifetime without developing health effects.

EXPOSURE SYMPTOM - Health effect produced by exposure to a chemical material, such as headache or skin irritation.

EXTINGUISHING MEDIA - The fire fighting substance to be used to control a material in the event of a fire. It is usually named by its generic name, such as fog, foam, water, etc.

EXTINGUISHING MEDIUM - Chemical used to put out a fire.

EXTREMELY HAZARDOUS SUBSTANCES - Any of 406 chemicals identified by EPA on the basis of toxicity, and listed under SARA Title III. The list is subject to revision.

EYE CONTACT HAZARD - Chemical material that damages or irritates the eye on contact or is systemically absorbed (with either the bulk chemical or its airborne forms), or that can be absorbed through the eyes; an exposure route.

EYE PROTECTION - Recommended safety glasses, chemical splash goggles, face shields, etc., to be utilized when handling a hazardous material.

f/cc - Fibers per cubic centimeter of air.

FACOSH - Federal Advisory Council for Occupational Safety and Health is a joint management-labor council that advises the Secretary of Labor on matters relating to the occupational safety and health of Federal employees.

FAM - Friable Asbestos Material.

FAMILY, CHEMICAL - Name given to a group of chemicals having related structures or properties (e.g., aliphatic hydrocarbons).

FAHRENHEIT (F) - A scale for measuring temperature. On the Fahrenheit scale, water boils at 212 degrees F and freezes at 32 degrees F.

FDA - US Food and Drug Administration.

FEA - Federal Energy Administration.

FEDERAL REGISTER - This publication, issued every workday, is the legal medium for recording and communicating the rules and regulations established by the executive branch of the federal government. Individuals or corporations cannot be held legally responsible for compliance with a regulation unless it has been published in the Register. In addition, executive agencies are required to publish in advance some types of proposed regulations.

FEMA - Federal Emergency Management Agency.

FERC - Federal Energy Regulatory Commission.

FFDCA - Federal Food, Drug, and Cosmetic Act.

FFSHC - Field Federal Safety and Health Councils are organized throughout the country to improve Federal safety and health programs at the field level and within a geographic location.

FHCP - Federal Hazard Communication Program.

FIBROSIS - An abnormal thickening of fibrous connective tissue, usually in the lungs.

FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act requires that certain useful poisons, such as chemical pesticides, sold to the public contain labels that carry health hazard warnings to protect users. It is administered by EPA.

FIRE HAZARD - Chemical material that ignites and burns easily, or that cause or supports fire in other materials; includes pyrophorics, flammables, combustibles, and oxidizers.

FIRST AID - Emergency measures to be taken when a person is suffering from overexposure to a hazardous material, before regular medical help can be obtained.

FLAMMABLE - A chemical that includes one of the following categories:

- (a) "Aerosol, flammable." An aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
- (b) "Gas, flammable." (1) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or (2) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit;
- (c) "Liquid, flammable." Any liquid have a flashpoint below 100 degree F (37.8 degree C), except any mixture having components with flashpoints of 100 degrees F (37.8 degrees C) or higher, the total of which make up 99 percent or more of the total volume of mixture.

GPG - Grams Per Gallon.

GROUNDING - Electrically connecting an object to ground, preventing sparks and shock.

HALOGEN - Any of a group of five chemically related nonmetallic elements that includes bromine, fluorine, chlorine, iodine, and astatine.

HALON - Bromine-containing compounds with long atmospheric lifetimes whose breakdown in the stratosphere cause depletion of ozone. Halons are used in firefighting.

HAND PROTECTION - Specific type of gloves or other hand protection required to prevent harmful exposure to hazardous materials.

HARD WATER - Alkaline water containing dissolved salts that interfere with some industrial processes and prevent soap from lathering.

HAZARD COMMUNICATION - The end result of special measures and activities conducted by employers. The purpose is to reduce and eliminate adverse health effects due to unnecessary exposures to hazardous materials. Hazard communication is achieved by recognition and evaluation of workplace hazards, accurate labeling of hazards, and effective training of employees about proper handling and use of those hazardous materials in the workplace. The OSHA Hazard Communication Standard describes how employers are to inform employees of workplace chemical hazards. The OSHA Standard is enforced under the regulations found in 29 CFR 1910.1200. See also right to know.

HAZARD COMMUNICATION PROGRAM - Written document that describes how an employer or facility complies with all requirements of the Federal Hazard Communication Standard (29 CFR 1910.1200).

HAZARD COMMUNICATION STANDARD - Federal law developed by OSHA to reduce illness and injury caused by chemical hazards in the workplace; requires evaluation of chemical hazards and communication of hazard information to both employers and employees.

HAZARD DETERMINATION (OR EVALUATION) - Process of finding out whether a chemical material is hazardous and what the hazards are.

HAZARD WARNING - Words, pictures, symbols, or combination thereof presented on a label or other appropriate form to inform of the presence of various materials.

HAZARDOUS CHEMICAL - Any chemical whose presence or use is a physical hazard or a health hazard.

HAZARDOUS CHEMICAL INVENTORY - List of all hazardous chemicals known to be present in a given workplace; identity/name of chemicals used on this list must match the identity/name used on the warning labels and MSDSs.

HAZARDOUS INGREDIENT - Chemical in a mixture that presents either a physical hazard or a health hazard.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS) - An integrated approach to working with hazardous materials. The system includes information on assessing hazards, labeling, and training. It was devised by the National Paint and Coatings Association. The label includes information such as chemical identification, acute hazard ratings, long-term health hazard potential and appropriate personal protective equipment. For more information write to: national Paint and Coatings Association, 1500 Rhode Island Avenue NW, Washington, DC 20005.

HAZARDOUS SUBSTANCE - 1. Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive or chemically reactive. 2. Any substance designated by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted to the environment.

HAZARDS ANALYSIS - The procedures involved in: (1) identifying potential sources of release of hazardous materials from fixed facilities or transportation accidents; (2) determining the vulnerability of a geographical area to a release of hazardous materials; and (3) comparing hazards to determine which present greater or lesser risks to a community.

HCS - Hazard Communication Standard is an OSHA regulation issued under 29 CFR part 1910.1200.

HEALTH HAZARD - Any chemical material that can cause illness or injury when a person is exposed by ingestion, skin or eye contact, skin absorption, or inhalation.

HEAVY METALS - Metallic elements with high atomic weights, e.g., mercury, chromium, cadmium, arsenic, and lead. They can damage living things at low concentrations and tend to accumulate in the food chain.

HEMATOLOGY - The study of blood.

HEMATOMA - A blood clot under the surface of the skin.

HEMATOPOIETIC SYSTEM - The blood-making organs, especially bone marrow and lymph nodes.

HEPA - High-Efficiency Particulate Air.

HEPATOTOXIN - A substance that causes injury to the liver.

HIGH-DENSITY POLYETHYLENE - A material that produces toxic fumes when burned. Used to make plastic bottles and other products.

HIGH TOXICITY - Description applying to chemicals that can produce either life-threatening or seriously disabling health effects.

HIGHLY TOXIC - A chemical falling within any of the following categories:

- (a) A chemical with a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- (b) A chemical with a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
- (c) A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

HMIS - Hazardous Material Information System is an MSDS file maintained by the Department of Defense and contains MSDS's and transportation data for products purchases by DOD and GSA.

HMTA - Hazardous Materials Transportation Act.

HMTR - Hazardous Materials Transportation Regulations.

HOOD CAPTURE EFFICIENCY - The emissions from a process that are captured by hood and directed into the control device, expressed as a percent of all emissions.

HORMONES - Act as chemical messengers to body organs.

HOUSEKEEPING - An administrative control that involves containing and removing chemical hazards - e.g. vacuuming, proper storage and handling, prompt removal and correct disposal of chemical wastes.

HSL - Hazardous Substance List.

HTP - High Temperature and Pressure.

HUMAN DATA (APPENDIX B) - "Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation." One of the mandatory considerations for health hazard determination in Appendix B.

HVAC - Heating, Ventilation, and Air Conditioning (System).

HW - Hazardous Waste.

HYDROCARBONS (HCs) - Chemical compounds that consist entirely of carbon and hydrogen.

HYDROGEN SULFIDE (HS) - Gas emitted during organic decomposition. Also a by-product of oil refining and burning. It smells like rotten eggs and, in heavy concentration, can cause illness.

HYPERGOLIC - Igniting upon contact of components without external aid (as a spark).

HYPOXIA - Lack of an adequate amount of oxygen in inspired air such as occurs at high altitudes; reduced oxygen content or tension. See also Anoxia.

ICS - Institute for Chemical Studies.

ICWM - Institute for Chemical Waste Management.

IDENTITY (OSHA) - "...means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS."

IG - Inspector General.

IGNITABLE - Capable of being set afire.

IGNITION TEMPERATURE - The lowest temperature at which a material can catch fire and burn independently of other heat sources.

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) - The maximum level to which a healthy individual can be exposed to a chemical for 30 minutes and escape without suffering irreversible health effects or impairing symptoms. Used as a "level of concern". See also level of concern.

IMMEDIATE EFFECT - Health effect that appears right away - either during the exposure or shortly afterwards.

IMMEDIATE USE (OSHA) - "...means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred." Employers are not required to label containers designated for an "immediate use" purpose.

IMPERVIOUS - Unable to be penetrated.

INCINERATION - 1. Burning of certain types of solid, liquid, or gaseous materials. 2. A treatment technology involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to remove the water and reduce the remaining residues to a safe nonburnable ash that can be disposed of safely on land, in some waters, or in underground locations.

INCINERATOR - A furnace for burning wastes under controlled conditions.

INCOMPATIBLE - materials that could cause dangerous reactions by direct contact with one another.

INDUSTRIAL HYGIENIST - Expert in the recognition, evaluation, and control of safety and health hazards.

INFLAMMABLE - Flammable.

INFLAMMATION - Tissue reaction to injury; the succession of changes that occur in living tissue when it is injured. The inflamed area undergoes continuous change as the body repair processes start to heal and replace injured tissue.

INGESTION - The way that a chemical enters the body if you swallow it, an exposure route.

INGREDIENT - See Hazardous Ingredient.

INHALATION - The way that a chemical enters the body when you breathe it through your nose or mouth; an exposure route.

INHIBITOR - A chemical added to another substance to prevent an unwanted chemical change.

INORGANIC CHEMICALS - Chemical substances of mineral origin, not of basically carbon structure.

INSOLUBLE - Incapable of being dissolved in a liquid.

INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) - Agency that evaluates the research data on substances tested for their carcinogenic potential. IARC publishes information on carcinogens and potential carcinogens. The IARC listing is one of the references that must be used to identify cancer-causing chemicals on MSDSs.

INVENTORY - A list or inventory of hazardous chemicals known to be present in the workplace is a required component of the written hazard communication program. This list is to be cross-referenced with the MSDS and the label. See also identity.

ION - An electrically charged atom or group of atoms that can be drawn from wastewater during the electrodialysis process.

IONIZING RADIATION - Radiation that can remove electrons from atoms, i.e., alpha, beta, and gamma radiation.

IRPTC - International Register of Potentially Toxic Chemicals.

IRRITANT - Health hazard that reacts with body tissues at the point of contact causing reddening, itching, tearing, irritation, and/or minor inflammation.

IRRITATING - An irritating material, as defined by DOT, is a liquid or solid substance which, upon contact with fire or when exposed to air, gives off dangerous or intensely irritating fumes (not including poisonous materials). See Poison, Class A and Poison, Class B.

ISOLATION - Engineering control that involves using an enclosure, barrier, or safe distance to separate workers from exposure hazards.

ISOMER - One of two or more chemical substances that have the same molecular formula but different chemical and physical properties due to different arrangement of the atoms in the molecule.

ISOTOPE - A variation of an element that has the same atomic number but a different weight because of its neutrons. Various isotopes of the same element may have different radioactive behaviors.

JOB HAZARD ANALYSIS - A process by which a job is studied to determine the hazards involved and ways to safely complete the job by procedures and/or personal protective equipment. See also the chapter on Job Hazard Analysis.

KG - Kilogram.

KW - Kilowatt.

KWH - Kilowatt Hour.

L - Liter is a metric unit of capacity. A US quart is about 9/10 of a liter.

LABEL - Notice attached to a container, bearing information concerning its contents.

LC - Lethal concentration is the concentration of a substance being tested with will kill; Liquid Chromatograph.

LCL - Lethal concentration, low, lowest concentration of a gas or vapor capable of killing a specified species. Over a specified time.

LC50 - The concentration of a material in air that will kill 50 percent of a group of test animals with a single exposure (usually 1 to 4 hours). The LC50 is expressed as parts of material per million parts of air, by volume (ppm) for gases and vapors, or as micrograms of material per liter of air (g/l) or milligrams of material per cubic meter of air (mg/m³) for dusts and mists, as well as for gases and vapors.

LD - Lethal dose is the quantity of a substance being tested that will kill.

LDL - Lethal dose low, lowest administered dose of a material capable of killing a specified test species.

LD 0 - The highest concentration of a toxic substance at which none of the test organisms die.

LD50 - A single dose of a material expected to kill 50 percent of a group of test animals. The LD50 dose is usually expressed as milligrams or grams of material per kilogram of animal body weight (mg/kg or g/kg). The material may be administered by mouth or applied to the skin.

LD LO - The lowest concentration and dosage of a toxic substance that kills test organisms.

LDS - Leak Detection System.

LEAD (PE) - A heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. See also heavy metals.

LEL, OR LFL - Lower explosive limit, or lower flammable limit, of a vapor or gas; the lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc, or flame) is present. At concentrations lower than the LEL, the mixture is too "lean" to burn. Also see "UEL".

LESION - Any damage to a tissue.

LETHAL CONCENTRATION 50 (LC50) - The concentration in air of a toxic substance that was required to cause the death of half the test animal population under controlled administration. This evaluates inhalation as a potentially harmful route of entry. LC50 data is used to assess the toxicity of a chemical.

LETHAL DOSE 50 (LD50) - The dose or amount of toxic substance that was required to cause death in half the test animal population under controlled administration. Either ingestion or skin contact may be evaluated. LD50 data is used to assess the toxicity of a chemical.

LEVEL OF CONCERN (LOC) - The concentration in air of an extremely hazardous substance above which there may be serious immediate health effects to anyone exposed to it for short periods of time.

LFL - Lower Flammability Limit.

LFM - Linear feet per minute, a unit of air velocity.

LIMITING FACTOR - A condition, whose absence, or excessive concentration, is incompatible with the needs or tolerance of a species or population and which may have a negative influence on their ability to grow or even survive.

LINER - 1. A relatively impermeable barrier designed to prevent leachate from leaking from a landfill. Liner materials include plastic and dense clay. 2. An insert or sleeve for sewer pipes to prevent leakage or infiltration.

LIQUEFACTION - Changing a solid into a liquid.

LIQUID - Physical form of a chemical that has no definite shape, but takes the shape of its container; has a boiling point above room temperature.

LOCAL EMERGENCY PLANNING COMMITTEE (LEPC) - A committee appointed by the state emergency response commission, as required by SARA Title III, to formulate a comprehensive emergency plan for its jurisdiction.

LOCAL EXHAUST - A system for capturing and exhausting contaminants from the air at the point where the contaminants are produced (welding, grinding, sanding, other processes or operations). Also see "general exhaust".

LOCAL EXHAUST VENTILATION - Type of ventilation system that captures an airborne hazard as it is released at the source and takes it out of the workplace.

LOW TOXICITY - Description applying to chemicals that produce only minor health effects - effects that usually go away with or without medical attention when exposure stops.

LOWER EXPLOSIVE LIMIT (LEL) - Data on the MSDS that defines the minimum amount of airborne chemical that must be present in an air-chemical mixture to make it explosive.

LOWER FLASH POINT LIMIT - The lowest concentration of a combustible or flammable gas or vapor in air that will produce a flash of fire. Mixtures below this concentration are too lean to burn. The lower flash point limit of toluene is 1.27%. See also flash point; upper flash point limit.

LPG - Liquified Petroleum Gas.

LUNG AGENTS (APPENDIX A) - Chemicals that irritate or damage lung tissue. Examples include asbestos, silica.

LUST - Leaking Underground Storage Tank(s) (current usage omits the "L").

M - Meter is a unit of length in the metric system. One meter is about 39 inches.

M3 - Cubic Meter.

MALAISE - A feeling of general discomfort, distress, or uneasiness, an out-of-sorts feeling.

MALIGNANT - Tending to become progressively worse and to result in death.

MANUFACTURER'S FORMULATION - A list of substances or component parts as described by the maker of a coating, pesticide, or other product containing chemicals or other substances.

MATC - Maximum Allowable Toxicant Concentration.

MATERIAL SAFETY DATA SHEET (MSDS) - Written document that identifies a chemical material; gives its physical properties; describes known physical hazards, health hazards, and required controls; and identifies correct procedures for putting out fire, cleaning up a spill or leak, disposing of waste, and handling/storing the material safely.

MAXIMUM CONTAMINANT LEVEL (MCL) - The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

MECHANICAL EXHAUST - A powered device, such as a motor-driven fan or air stream venturi tube, for exhausting contaminants from a workplace, vessel or enclosure.

MECHANICAL FILTER RESPIRATOR - A respirator used to protect against airborne particulate matter like dusts, mists, metal fume, and smoke. Mechanical filter respirators do not provide protection against gases, vapors, or oxygen deficient atmospheres.

MEDICAL MONITORING - Type of administrative control that involves physical examinations and/or lab tests to establish an individual's baseline health status and check the effectiveness of other controls used to protect an individual from health hazards.

MEDICAL SURVEILLANCE - Many of the chemicals that are regulated by OSHA have requirements that the employer conduct medical surveillance on employees to assure that chemical exposure is within the acceptable limits. Substances with requirements for medical surveillance are covered in 29 CFR 1910.1047.

MELTING POINT - The temperature at which a solid substance changes to a liquid state.

MERCURY - A heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed. See also heavy metals.

MESA - Mining Enforcement and Safety Administration.

METABOLISM - Physical and chemical processes taking place among the ions, atoms, and molecules of the body.

METHANE - A colorless, nonpoisonous, flammable gas created by anaerobic decomposition of organic compounds.

MG - Milligram.

MG/KG - Milligrams of substance per kilogram of body weight is an expression of toxicological dose.

MG/M3 - Milligrams per cubic meter is a unit for expressing concentrations of dusts, gases, or mists in air.

MH - Man-Hours.

MICROGRAM (U.G.) - One-millionth of a gram.

MICRON - Micrometer is a unit of length equal to one-millionth of a meter. A micron is approximately 1/25,000 of an inch.

MILLIGRAMS PER CUBIC METER (MG/M3) - Unit used to express exposure limits; defines the mass of chemical contaminant (in milligrams) allowed in each cubic meter volume of air.

MILLILITER - A metric unit of capacity of one cubic centimeter.

MILLIMETER - A metric unit of measure equal to one thousandth of a meter.

MILLION-GALLONS PER DAY (MGD) - A measure of water flow.

MINE SAFETY AND HEALTH ADMINISTRATION (MSHA) (DOL) along with NIOSH, MSHA is responsible for testing and approving respirators.

MISCIBLE - The extent to which liquids or gases can be blended.

MIST - Airborne form of a liquid chemical; consists of tiny droplets.

MIXTURE - Material that contains more than one chemical.

ML - Milliliter.

MLD - Mild

MMHg - Millimeters (mm) of mercury (Hg) is a unit of measurement for low pressures or partial vacuums.

MMT - Million Metric Tons.

MODERATE TOXICITY - Description applying to chemicals that produce health effects requiring medical attention; damage may be permanent but is neither life-threatening nor seriously disabling.

MOLECULAR WEIGHT - Weight (mass) of a molecule based on the sum of the atomic weights of the atoms that make up the molecule.

MONITORING - An administrative control that checks the effectiveness of other controls by analyzing air samples, wipe samples, and personal exposure levels; may involve medical monitoring.

MOS - Margin of Safety.

MP - Melting Point.

MPPCF - Million particles per cubic foot is a unit for expressing concentration of particles of a substance suspended in air. Exposure limits for mineral dusts (silica, graphite, Portland cement, nuisance dusts, and others), formerly expressed as mppcf, are now more commonly expressed in mg/m³.

MS - Mass Spectrometry.

MTD - Maximum Tolerated Dose.

MUTAGEN - Reproductive hazard that causes genetic changes in sperm or egg cells.

MUTATE - To bring about a change in the genetic constitution of a cell by altering its DNA. In turn, "mutagenesis" is any process by which cells are mutated.

MW - Megawatt; See molecular weight.

N/A - Not Applicable, Not Available.

N₂ - Nitrogen is a colorless, odorless, and tasteless gas that will not burn and will not support combustion. The earth's atmosphere (air) is about 78 percent nitrogen. At higher concentrations, nitrogen can displace oxygen and become a lethal asphyxiant. See "Asphyxiant".

NARCOSIS - A state of stupor, unconsciousness, or arrested activity produced by the influence of narcotics or other chemicals.

NAS - National Academy of Sciences.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - A nonprofit organization that provides information on fire protection and prevention. Among the publications the NFPA develops is the 704 Standard for the Identification of the Fire Hazards of Materials.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) - Involved in research on health effects due to workplace exposures. Research is used to make recommendations for reducing or preventing worker exposures. NIOSH is also responsible for testing and certifying respirators.

NATIONAL RESPONSE CENTER - The federal operations center that receives notifications of all releases of oil and hazardous substances into the environment. The Center, open 24 hours a day, is operated by the US Coast Guard, which evaluates all reports and notifies the appropriate agency.

NATIONAL RESPONSE TEAM (NRT) - Representatives of 13 federal agencies that, as a team, coordinate federal responses to nationally significant incidents of pollution and provide advice and technical assistance to the responding agency(ies) before and during a response action.

NATIONAL TOXICOLOGY PROGRAM (NTP) - The annual Report on Carcinogens is a result of work completed under the NTP. See also Annual Report on Carcinogens.

NATURAL GAS - A natural fuel containing primarily methane and ethane that occurs in certain geologic formations.

NAUSEA - A stomach distress with distaste for food and an urge to vomit.

NBS - National Bureau of Standards.

NCI - National Cancer Institute is that part of the National Institutes of Health which studies cancer causes and prevention as well as diagnosis, treatment, and rehabilitation of cancer patients.

NCRIC - National Chemical Response and Information Center.

NEOPLASIA - A condition characterized by the presence of new growths (tumors).

NEPHROTOXIN - A substance that causes injury to the kidneys.

NETC - National Emergency Training Center.

NEURITIS - Inflammation of a nerve or nerves, usually associated with a degenerative process.

NEUROTOXIN - A material that affects the nerve cells and may produce emotional or behavioral abnormalities.

NEUTRALIZATION - Decreasing the acidity or alkalinity of a substance by adding to its alkaline or acidic materials respectively.

NEUTRALIZE - To eliminate potential hazards by inactivating strong acids, caustics, and oxidizers. For example, acids can be neutralized by adding an appropriate amount of caustic substance to the spill.

NG - Nanogram, one-billionth of a gram.

NGA - Natural Gas Association.

NHTSA - National Highway Traffic Safety Act, National Highway Traffic Safety Administration (DOT).

NICS - National Institute for Chemical Studies.

NIH - National Institutes of Health.

NIMBY - Not In My Backyard.

NITRATE - A compound containing nitrogen that can exist in the atmosphere or as a dissolved gas in water and which can have harmful effects on humans and animals. Nitrates in water can cause severe illness in infants and cows.

NITRIC OXIDE (NO) - A gas formed by combustion under high temperature and high pressure in an internal combustion engine. It changes into nitrogen dioxide in the ambient air and contributes to photochemical smog.

NITRILOTRIACETIC ACID (NTA) - A compound being used to replace phosphates in detergents.

NITRITE - 1. An intermediate in the process of nitrification. 2. Nitrous oxide salts used in food preservation.

NITROGEN DIOXIDE (NO₂) - The result of nitric oxide combining with oxygen in the atmosphere. A major component of photochemical smog.

NITROGEN OXIDE - A product of combustion from transportation and stationary sources and a major contributor to the formation of ozone in the troposphere, and acid deposition.

NLM - National Library of Medicine.

NMHC - Nonmethane Hydrocarbons.

NOAEL - No Observed Adverse Effect Level.

NOC - Notice of Commencement; not otherwise classified.

NOHSCP/NCP - See National Oil and Hazardous Substances Contingency Plan (? not here)

NONFLAMMABLE - Not easily ignited, or if ignited, not burning rapidly.

NONIONIZING ELECTROMAGNETIC RADIATION - 1. Radiation that does not change the structure of atoms but does heat tissue and may cause harmful biological effects. 2. Microwaves, radio waves, and low-frequency electromagnetic fields from high-voltage transmission lines.

NONSPARKING TOOLS - Tools made from beryllium-copper or aluminum-bronze greatly reduce the possibility of igniting dusts, gases, or flammable vapors. Although these tools may emit some sparks when striking metal, the sparks have a low heat content and are not likely to ignite most flammable liquids.

NOX - Oxides of nitrogen which are undesirable air pollutants. NO emissions are regulated by EPA under the Clean Air Act.

NPIRS - National Pesticide Information Retrieval System is an automated data base operated by Purdue University containing information on EPA registered pesticides, including reference file MSDS's.

NRC - Nuclear Regulatory Commission; National Response Center is a notification center which must be called when significant oil or chemical spills or other environment-related accidents occur. The toll-free telephone number is 1-800-424-8802.

NSF - National Science Foundation.

NTE - Not To Exceed.

NTIS - National Technical Information Service.

NTSB - National Transportation Safety Board.

NUCLEAR POWER PLANT - A facility that converts atomic energy into usable power; heat produced by a reactor makes steam to drive turbines which produce electricity.

O&G - Oil and Gas.

O&M - Operations and Maintenance.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) - Federal agency within the Department of Labor that develops and enforces standards for workplace safety and health.

OD - Outside Diameter.

ODOR - A description of the smell of the substance.

ODOR THRESHOLD - The lowest concentration of a substance's vapor, in air, that can be smelled.

OFFICE OF FEDERAL AGENCY PROGRAMS (OFAP) - The organizational unit of OSHA which provides Federal agencies with guidance to develop and implement occupational safety and health programs for Federal employees.

OLFACTORY - Relating to the sense of smell.

ONCOGENIC - A substance that causes tumors, whether benign or malignant.

OPAQUE - Nontransparent and nontranslucent.

ORAL - used in or taken into the body through the mouth.

ORAL TOXICITY - Adverse effects resulting from taking a substance into the body by mouth. Ordinarily used to denote effects in experimental animals.

ORGANIC CHEMICALS/COMPOUNDS - Animal - or plant- produced substances containing mainly carbon, hydrogen, and oxygen.

ORGANIC PEROXIDE - An organic compound that contains the bivalent -O-O structure and may be considered a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

ORGANOPHOSPHATES - Pesticide chemicals that contain phosphorus; used to control insects. They are short-lived, but some can be toxic when first applied.

ORGANOTINS - Chemical compounds used in antifoulant paints to protect the hulls of boats and ships, buoys, and dock pilings from marine organisms such as barnacles.

OSMOSIS - The tendency of a fluid to pass through a permeable membrane such as the wall of a living cell into a less concentrated solution so as to equalize the concentrations on both sides of the membrane.

OVEREXPOSURE - Exposure to a hazardous material beyond the allowable exposure levels.

OXIDANT - A substance containing oxygen that reacts chemically in air to produce a new substance. The primary ingredient of photochemical smog.

OXIDATION - in a literal sense, oxidation is a reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent.

OXIDIZER - Chemical material that supplies the oxygen required to start or support fire. Common oxidizers include chlorine gas, oxygen and peroxides.

OXIDIZING AGENT - A chemical that gives off free oxygen in a chemical reaction.

OXYGENATED SOLVENT - An organic solvent containing oxygen as part of the molecular structure. Alcohols and ketones are oxygenated compounds often used as paint solvents.

PALPITATION - Rapid, irregular beating of the heart.

PAPR - Powered Air Purifying Respirator.

PARTICULATE LOADING - The mass of particulates per unit volume of air or water.

PARTICULATES - Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions.

PARTS PER MILLION (PPM) - Unit used to express exposure limits; defines parts of the chemical allowed in each one million (1,000,000) parts of the air-chemical mixture.

PATHOGENIC - Capable of causing disease.

PATHOGENS - Microorganisms that can cause disease in other organisms or in humans, animals, and plants. They may be bacteria, viruses, or parasites and are found in sewage, in runoff from animal farms or rural areas populated with domestic and/or wild animals, and in water used for swimming. Fish and shellfish contaminated by pathogens, or the contaminated water itself, can cause serious illnesses.

PATHOLOGIC - Pertaining to or caused by disease.

PATHOLOGY - Scientific study of alterations produced by disease.

PCBs - A group of toxic, persistent chemicals (polychlorinated biphenyls) used in transformers and capacitors for insulating purposes and in gas pipeline systems as a lubricant. Further sale of new use was banned by law in 1979.

PENETRATION - The passage of a chemical through an opening in a protective material. Holes and rips in protective clothing can allow penetration as can stitch holes, space between zipper teeth, and open jacket and pant cuffs. See also chemical-protective clothing.

PERCENT VOLATILE - Percent volatile by volume is the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70 degrees F (unless some other temperature is specified). Examples: butane, gasoline, and paint thinner (mineral spirits) are 100 percent volatile; their individual evaporation rates vary, but, in time, each will evaporate completely.

PERMEATION - The passage of a chemical through a piece of clothing on a molecular level. If a piece of clothing is permeated, the chemical may collect on the inside, increasing the chance of skin contact with that chemical. Permeation is independent of degradation. Permeation may occur even though the clothing may show no signs of degradation. See also chemical-protective clothing.

PERMISSIBLE EXPOSURE LIMIT (PEL) - Exposure limit set and enforced by OSHA. (See Exposure Limit).

PERSONAL MONITORING - Type of administrative control that involves the worker's wearing a badge or other sampling device to measure exposure to a chemical hazard in the workplace.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Equipment that protects the individual who wears it by placing a barrier between that individual and a hazard; includes protective eyewear, face shields and masks, gloves, boots, hats, clothing, and respirators.

PH - A measure of the acidity or alkalinity of a liquid or solid material.

PHENOLIS - Organic compounds that are by-products of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations cause taste and odor problems in water; higher concentrations can kill aquatic life and humans.

PHOSPHATES - Certain chemical compounds containing phosphorus.

PHOSPHORUS - An essential chemical food element that can contribute to the eutrophication of lakes and other water bodies. Increased phosphorus levels result from the discharge of phosphorus-containing materials into surface waters.

PHS - (US) Public Health Service.

PHSA - Public Health Service Act.

PHYSICAL/CHEMICAL CHARACTERISTICS - Information on the MSDS that describes the appearance, odor, boiling point, vapor pressure, vapor density, evaporation rate, specific gravity, and water solubility of a chemical material.

PHYSICAL HAZARD - Any chemical material that can cause fire, explosion, violent chemical reactions, or other similarly hazardous situations.

PICOCURIES PER LITER (pCi/l) - A unit of measure used for expressing levels of radon gas. See also picocurie.

REACTIVE CHEMICAL - Material that reacts violently on contact with certain other chemical materials to produce or release a hazard.

REACTIVITY - A measure of the tendency of a substance to undergo chemical reaction with the release of energy.

RECOMMENDED EXPOSURE LIMIT (REL) - Exposure limit recommended by the National Institute for Occupational Safety and Health (NIOSH).

REDUCING AGENT - In a reduction reaction (which always occurs simultaneously with an oxidation reaction) the reducing agent is the chemical or substance which (1) combines with oxygen or (2) loses electrons to the reaction. See "oxidation".

REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) - A NIOSH publication that is one of the information sources OSHA recommends for hazard determination. RTECS provides data on toxicity for over 50,000 different chemicals. It has an extensive cross-reference, listing trade names and synonyms. It is available as hard copy computer tape, microfiche, and on-line through the National Library of Medicine.

REPRODUCTIVE HAZARD - Health hazard that targets the human reproductive system; category that includes teratogens and mutagens.

REPRODUCTIVE TOXIN - Substances that affect either male or female reproductive systems and may impair the ability to have children.

RESPIRATORY PROTECTION - Devices that will protect the wearer's respiratory system from overexposure by inhalation to airborne contaminants. Respiratory protection is used when a worker must work in an area where he/she might be exposed to concentration in excess of the allowable exposure limit.

RESPIRATORY SYSTEM - The breathing system that includes the lungs and the air passages (trachea or "windpipe", larynx, mouth, and nose) to the air outside the body, plus the associated nervous and circulatory supply.

RIBONUCLEIC ACID (RNA) - A molecule that carries the genetic message from DNA to a cell's protein-producing mechanisms; similar to, but chemically different from, DNA.

RIGHT TO KNOW - A term applied to a variety of laws and regulations enacted by municipal, county, and state governments that provide for the availability of information on chemical hazards; also includes the OSHA Hazard Communication Standard. See also hazard communication.

RODENTICIDE - A chemical or agent used to destroy rats or other rodent pests, or to prevent them from damaging food, crops, etc.

ROENTGEN EQUIVALENT MAN - The unit of dose equivalent from ionizing radiation to the human body, used to measure the amount of radiation to which a person or a part of a human has been exposed.

ROUTES OF ENTRY - The means by which material may gain access to the body, for example, inhalation, ingestion, and skin contact.

RP - Respirable particulates.

RPM - Revolutions Per Minute.

SARA - Superfund Amendments and Reauthorization Act of 1986.

SCFM - Standard Cubic Feet Per Minute.

SELF-CONTAINED BREATHING APPARATUS - A respiratory protection device that consists of a supply or a means of respirable air, oxygen, or oxygen-generating material, carried by the wearer.

SENSITIZATION - 1. A condition of being made sensitive to a specific substance (i.e. antigen) such as a protein or pollen. 2. The process of making a person susceptible to a substance by repeated injections of it, as a serum.

SENSITIZER - Health hazard that produces an allergic-like reaction in some people after repeated exposure.

SEPC - State Emergency Planning Commission.

SETA - Setaflash Closed Tester. See flashpoint.

SILICOSIS - A disease of the lungs caused by the inhalation of silica dust.

"SKIN" - A notation (sometimes used with PEL or TLV exposure data) which indicates that the stated substance may be absorbed by the skin, mucous membranes, and eyes – either airborne or by direct contact – and that this additional exposure must be considered part of the total exposure to avoid exceeding the PEL or TLV for that substance.

SKIN ABSORPTION - Way that some chemicals pass through the skin on contact and enter the bloodstream; an exposure route.

SKIN CONTACT HAZARD - Chemical material that damages or irritates the skin on contact; an exposure route.

SKIN TOXICITY - See "Dermal Toxicity".

SMOKE - An airborne mixture of fire gases, dust, and fumes.

SOLID - Physical form of a chemical that has a definite shape.

SOLUBILITY IN WATER - Physical data element on the MSDS that describes whether or not a material dissolves in water.

SOOT - Carbon dust formed by incomplete combustion.

PIFE - Polytetrafluoroethylene (Teflon).

PIG - A container, usually lead, used to ship or store radioactive materials.

PLASTICS - Nonmetallic compounds that result from a chemical reaction, and are molded or formed into rigid or pliable construction materials or fabrics.

PLUTONIUM - A radioactive metallic element similar chemically to uranium.

PMCC - Pensky-Martens Closed Cup. See Flashpoint.

PNEUMOCONIOSIS - A condition of the respiratory tract due to inhalation of dust particles.

POE - Point of Exposure.

POI - Point of Interception.

POISON - A substance that causes the disturbance, disease, or death of an organism.

POISON, CLASS A - A DOT term for extremely dangerous poisons—poisonous gases or liquids that, in very small amounts, either as gas or as vapor of the liquid, mixed with air, are dangerous to life. Examples: phosgene, cyanogen, hydrocyanic acid, nitrogen peroxide.

POISON, CLASS B - A DOT term for liquid, solid, paste or semisolid substances—other than Class A poisons or irritating materials—that are known (or presumed on the basis of animal tests) to be so toxic to humans that they are a hazard to health during transportation.

POLYELECTROLYTES - Synthetic chemicals that help solids to clump during sewage treatment.

POLYMER - The basic molecular ingredient in plastic.

POLYMERIZATION - A chemical reaction in which two or more small molecules combine to form larger molecules.

POLYMERIZATION HAZARD - Unstable chemical that undergoes a violent reaction and release of energy that produces or releases a hazard when two or more small molecules combine (self-react) to form large molecules called polymers.

POLYVINYL CHLORIDE (PVC) - A tough, environmentally indestructible plastic that releases hydrochloric acid when burned.

PORTABLE CONTAINERS - Portable containers need not be labeled if they are for "immediate use". See also immediate use.

PPB - Parts per billion.

PPC - Personal Protective Clothing.

PPE - Personal Protective Equipment.

PPTH - Parts per thousand.

PRODUCE (OSHA) - "...means to manufacture, process, formulate, or repackage."

PSI - Pounds Per Square Inch (Pressure).

PULMONARY - Relating to, or associated with, the lungs.

PULMONARY EDEMA - Fluid in the lungs.

PYROPHORIC - Chemical material that spontaneously bursts into flame when exposed to air at temperatures below 130 degrees F; no ignition source is needed.

QA - Quality Assurance.

QAO - Quality Assurance Officer.

qBtu - Quadrillion British thermal units.

QC - Quality Control.

R & D - Research and Development.

RADIATION - Any form of energy propagated as rays, waves, or streams of energetic particles. The term is frequently used in relation to the emission of rays from the nucleus of an atom.

RADIATION ABSORBED DOSE (RAD) - A unit of absorbed dose of radiation. One RAD of absorbed dose is equal to .01 joules per kilogram.

RADIOACTIVE SUBSTANCES - Substances that emit radiation.

RADIO FREQUENCY RADIATION - See nonionizing radiation.

RADON - A colorless, naturally occurring, radioactive, inert gaseous element formed by radioactive decay of radium atoms in soil or rocks.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) is environmental legislation aimed at controlling the generation, treating, storage, transportation and disposal of hazardous wastes. It is administered by EPA.

REACTION - A chemical transformation or change. The interaction of two or more substances to form new substances.

REACTIVE (OSHA) - "...means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature." Considered a physical hazard under the law. See also decomposition; physical hazard; polymerization.

SOP - Standard (or Standing) Operating Procedure.

SORPTION - The action of soaking up or attracting substances. A process used in many pollution control systems.

SO_x - Oxides of sulfur.

SOLVENT - A substance, usually a liquid, in which other substances are dissolved. The most common solvent is water.

SPASM - An involuntary sudden movement or convulsive muscular contraction.

SPECIES - On the MSDS's species refers to the test animals – usually rats, mice, or rabbits -
- used to obtain the toxicity test data reported.

SPECIFIC CHEMICAL IDENTITY - The chemical name, Chemical Abstracts Service (CAS) Registry Number, or any precise chemical designation of a substance.

SPECIFIC GRAVITY - Physical data on the MSDS that describes whether a liquid is lighter or heavier than water.

SPILL OR LEAK PROCEDURES - The methods, equipment, and precautions that should be used to control or clean up a leak or spill.

SPLASH PROOF GOGGLES - Eye protection made of a noncorrosive material that fits snugly against the face, and has indirect ventilation ports.

SPONTANEOUSLY COMBUSTIBLE - A material that ignites as a result of retained heat from processing, or which will oxidize to generate heat and ignite, or which absorbs moisture to generate heat and ignite.

SQUAMOUS - Scaly or platelike.

STABILITY - How likely a material is to remain unchanged. Material is considered stable if it remains unchanged under normal conditions.

STANDARDS - Prescriptive norms that govern action and actual limits on the amount of pollutants or emissions produced.

STATE EMERGENCY RESPONSE COMMISSION (SERC) - A commission appointed by each state governor according to the requirements of SARA Title III. The SERC's designate emergency planning districts appoint local emergency planning committees and supervise and coordinate their activities. See also Local Emergency Planning Committee.

STEL - Short-Term Exposure Limit.

STP - Standard Temperature and Pressure.

SUBCUTANEOUS - Beneath the layers of the skin.

SUBSTITUTION - Engineering control that involves replacing a chemical, process, or piece of equipment with a less hazardous one.

SULFUR DIOXIDE (SO₂) - A heavy, pungent, colorless, gaseous air pollutant formed primarily by the combustion of fossil plants.

SUMP - A pit or tank that catches liquid runoff for drainage or disposal.

SUP - Standard Unit of Processing.

SUPPLIED AIR RESPIRATORS - Air line respirators of self-contained breathing apparatus.

SYNERGISM - The cooperative interaction of two or more chemicals or other phenomena producing a greater total effect than the sum of their individual effect.

SYNTHETIC ORGANIC CHEMICALS (SOCs) - Man-made organic chemicals. Some SOCs are volatile; others tend to stay dissolved in water rather than evaporate out of it.

SYS - System or systemic.

SYSTEMIC POISON - A poison which spreads throughout the body, affecting all body systems and organs. Its adverse effect is not localized in one spot or area.

SYSTEMIC TOXICITY - Adverse effects caused by a substance which affects the body in a general rather than local manner.

SYNONYM - Another name or names by which a material is known. Methyl alcohol, for example, is known as methanol or wood alcohol.

TARGET ORGAN CHEMICAL - Health hazard that enters the bloodstream and damages specific internal organs or body systems; effects can be delayed.

TARGET ORGAN EFFECTS - Those effects that are recognized to be a result of exposure to a specific chemical.

TARGET ORGAN TOXIN - A toxic substance that attacks a specific organ of the body. For example, overexposure to carbon tetrachloride can cause liver damage.

TC - Target Concentration, Toxic Concentration.

TCC - Tag (Tagliabue) Closed Cup. See flashpoint.

TCDD - Dioxin (Tetrachlorodibenzo-p-dioxin).

TCL - Toxic concentration low, the lowest concentration of a gas or vapor capable of producing a defined toxic effect in a specified test species over a specified time.

TD - Toxic Dose.

TDL - Toxic dose low, lowest administered dose of a material capable of producing a defined toxic effect in a specified test species.

TEMP - Temperature.

TER - See Teratogen.

TERATOGEN - Reproductive hazard that damages the fetus during its development.

Tfx - Toxic effect(s).

THRESHOLD LIMIT VALUE (TLV) - Exposure limit recommended by the American Conference of Governmental Industrial Hygienists (ACGIH). (See Exposure Limit).

TISE - Take It Somewhere Else (Solid Waste Syndrome. See also NIMBY).

TLV - See threshold limit value.

TNT - Trinitrotoluene.

TOC - TAG Open Cup. See flashpoint.

Torr - A unit of pressure, equal to 1/760 atmosphere.

TOXIC - Harmful to living organisms.

TOXICANT - A poisonous agent that kills or injures animal or plant life.

TOXIC CHEMICAL RELEASE FORM - An information form required to be submitted by facilities that manufacture, process, or use (in quantities above a specific amount) chemicals listed under SARA Title III.

TOXICITY - Description of the degree of health hazard associated with exposure to a chemical; see Low, Moderate, and High Toxicity.

TOXICOLOGY - The science and study of poisons control.

TOXIC SUBSTANCE - A chemical or mixture that may present an unreasonable risk of injury to health or the environment.

TPY - Tons Per Year.

TRADE NAME - The trademark name or commercial trade name for a material or product.

TRANSFER CONTAINER - Chemical container that does not require labels because only one person handles the container, and it is filled and emptied during the same shift.

TRI - Toxic Release Inventory.

TRICHLOROETHYLENE (TCE) - A stable, low-boiling colorless liquid, toxic by inhalation. TCE is used as a solvent, metal degreasing agent, and in other industrial applications.

TRICHALOMETHANE (THM) - One of a family of organic compounds, named as derivatives of methane. THMs are generally the by-product from chlorination of drinking water that contains organic material.

TSCA - Toxic Substances Control Act.

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

UEL - Upper Explosive Limit.

UFL - Upper Flammability Limit.

UG - Microgram, one-millionth of a gram.

UL - Underwriters' Laboratories.

UNDERGROUND STORAGE TANK (UST) - A tank located all or partially underground that is designed to hold gasoline or other petroleum products or chemical solutions.

UNSTABLE - Tending toward decomposition or other unwanted chemical change during normal handling or storage.

UNSTABLE CHEMICAL - Material that violently self-reacts under commonly occurring conditions; a type of physical hazard.

UNSTABLE REACTIVE - A chemical that, in the pure state, or as produced or transported, will vigorously polymerize, decompose condense, or become self-reactive under conditions of shocks, pressure, or temperature.

UPPER EXPLOSIVE LIMIT (UEL) - The maximum amount of airborne chemical that can be present in an air-chemical mixture and still have it be explosive.

UPPER FLASH POINT LIMIT - The highest concentration of a combustible or flammable gas or vapor in air that will produce a flash of fire. See also flash point; lower flash point limit.

URANIUM - A radioactive heavy metal element used in nuclear reactors and the production of nuclear weapons. The term refers usually to U-238, the most abundant radium isotope, although a small percentage of naturally occurring uranium is U-235.

USBM - United State Bureau of Mines.

USDA - US Department of Agriculture.

USDOI - US Department of the Interior.

USEPA - US Environmental Protection Agency.

USPHS - US Public Health Service.

UST - See Underground Storage Tank.

VAPOR - One airborne form of a liquid chemical.

VAPOR DENSITY - Physical data that describes whether the vapor formed by a material is lighter or heavier than air.

VAPOR PRESSURE - Force exerted on the walls of a closed container of liquid by vapor formed above the liquid surface.

VAPORIZATION - Process by which liquids become airborne.

VENTILATION - Engineering control that reduces airborne exposure levels either by mixing the hazard with fresh air, or by removing it as it is released at the source.

VERMICULITE - An expanded mica (hydrated magnesium-aluminum-iron silicate) used as sorbent for spill control and cleanup.

VINYL CHLORIDE - A chemical compound, used in producing some plastics, that is believed to be carcinogenic.

VOC - See Volatile Organic Compound.

VOLATILE - A description of any substance that evaporates readily.

VOLATILE ORGANIC COMPOUND (VOC) - Any organic compound that participates in atmospheric photochemical reactions except for those designated by the EPA Administrator as having negligible photochemical reactivity.

VOLATILITY - A measure of how quickly a substance forms a vapor at ordinary temperatures.

VISCOSITY - The tendency of a fluid to resist internal flow without regard to its density.

VP - Vapor Pressure.

WARNING LABEL - Document affixed to chemical containers (or posed by stationary containers) that identifies the chemical material and all appropriate hazard warnings.

WATER DISPOSAL METHODS - Proper disposal methods for contaminated material, recovered liquids or solids, and their containers.

WATER-REACTIVE - Chemical material that reacts with water or moist air to produce or release a hazard.

WATER SOLUBILITY - The maximum concentration of a chemical compound that can result when it is dissolved in water. If a substance is water-soluble it can very readily disperse through the environment.

WORK AREA - A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

WORKPLACE - An establishment at one geographical location containing one or more work areas.

WORK PRACTICES - Procedures normally used to do the job.

YTD - Year to Date.

ZRL - Zero Risk Level.

Right to Know Employee Exposure List

Employee _____ Department Highway

[illegible]

This list must be updated on an annual basis along with the Inventory for Hazardous Materials and both must be kept as part of your permanent records.

Recordkeeping

The Right-To-Know Law requires employers to keep a record of employee exposure to Subpart Z substances including: employee name, address, and social security number as well as the chemical and trade name(s), Chemical Abstract Service number (CAS), and manufacturer of each substance to which the employee is exposed*.

These records must be made available upon request to the employee, the employee's physician or representative, or to the State Health Department. The records must be kept 40 years and, if the firm ceases to operate in New York State, They must be sent to the State Health Department.

* Compiling an annual file containing a complete personnel roster and duplicate copies of MSDS's for all products in use may adequately address these recordkeeping requirements. Only the first page of each MSDS needs to be duplicated and kept which contains the information mentioned above.

Inventory Sheet for Hazardous Materials

Department: _____

Date: _____

Facility Location: _____

Inventory Counted By: _____

[illegible]

This list must be updated on an annual basis along with the Right to Know Employee Exposure List and both must be kept as part of your permanent records.

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