

Chapter 13 – Hazard Communication

13.1 Introduction

The County of Santa Clara is committed to protecting employees from exposure to hazardous materials in the workplace.

Environmental, Health and Safety (EHS) programs support compliance with federal, state and local regulations. Safety programs provide standard, consistent instructions on safe work practices for employees at the County.

The Hazard Communication Program addresses the protection of employees who may be exposed to hazardous chemicals in their workplace. This program describes the actions and steps that employees must take to be in compliance with the Hazard Communication Program elements. This program will also incorporate the Pesticide Use regulations to protect employees with potential pesticide exposure. Regulations governing these programs are listed below:

- California Code of Regulations, Title 8, Section 5194, Hazard Communication
- Code of Federal Regulations, Title 29, Section 1910.1200, Hazard Communication
- California Code of Regulation, Division 6, Chapter 3, subchapter 2, article 1, Pesticide use regulation

These laws require employers to provide information on physical and health hazards of the materials employees use or come in contact with as a part of their work.

Employees who may be exposed to hazardous chemicals in the workplace are provided with information on the associated hazards, and the control of those hazards through various methods:

- Chemical Inventories
- Labeling
- Safety Data Sheets (SDSs)
- Training

This Hazard Communication written program is available to all employees.

The law requires a written Hazard Communication Program (this document). The Program should be concise, understandable, accurate and must contain:

- Labeling, Safety Data Sheets, Employee Information and Training.
- A list of hazardous materials in the workplace.
- Hazards of non-routine tasks.
- Hazards of chemicals in unlabeled pipes.
- Precautionary measures for all employees during normal working conditions and foreseeable emergencies.

- Labeling systems used at worksites.
- Process of protecting employees, contractors, and visitors from exposure.
- Pesticide application records.

This program applies to employees who are involved in the following tasks:

- Perform work involving hazardous chemicals and pesticides
- Directly manage others who perform work involving hazardous chemicals
- Manage contractors who perform these activities

13.3 Roles and Responsibilities

Everyone has a role to play in the Hazard Communication Program. This section outlines the roles and responsibilities of all County employees.

13.3.1 Health Department (Environmental Health Services)

- Enforces various laws governing the storage and use of hazardous materials.

13.3.2 Agency/Department Head

- Ensures that supervisors implement the Hazard Communication Program.
- Provides support to Supervisors and Safety Coordinators to implement the Hazard Communication Program.

13.3.3 First Line Supervisor

- Completes and maintains the written Hazard Communication Program for each worksite. Review the program annually and update as needed to ensure effectiveness.
- Understands and implements the regulatory requirements of the Globally Harmonized System used to identify and classify chemicals.
- Ensures employees are provided clear information about Proposition 65, and their Right to Know about the chemical hazards in their workplace.
- Keeps an up to date Safety Data Sheet for each product containing a hazardous material, and makes these sheets available to employees. The SDS will be the most current one supplied by the manufacturer, importer or distributor. Supervisors may use the sample SDS request letter (Appendix A) to request a SDS from a manufacturer or distributor. Archive SDSs for hazardous materials no longer used, for at least 30 years.
- Maintains a complete inventory of products containing hazardous materials used at the work area. The inventory Sheet shown in Appendix B may be used for this purpose.
- Prevents the use or distribution of products containing a hazardous material until containers are clearly labeled, hazard warnings are affixed, and the name and address of the manufacturer has been listed. This includes all primary and secondary containers.
- Takes special precaution with pesticides (See Appendix C).

- Completes a hazardous materials implementation checklist (Appendix D) to assure full compliance with the Hazard Communication program.
- Ensures that employees are trained in accessing and using Safety Data Sheets.
- Ensures that employees are trained specifically about the proper handling of hazardous materials in their work area, including the physical, health, simple asphyxiation, combustible dust and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area.
- Ensures that employees are trained in the measures they can take to protect themselves from these hazards, including specific procedures implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
- Provides employees with protective equipment and clothing as needed.
- Makes sure that employees use protective equipment and clothing when they work with hazardous materials.
- Works with **Employee Services Agency OSEC Department** to determine whether a respiratory protection program is needed if Safety Data Sheets or other information indicates that a material poses a respiratory hazard.

13.3.4 Employee

- Remains alert for potential hazards of materials at their work sites, and tells his or her supervisor of suspected hazards.
- Understands and refers to Safety Data Sheets for specific hazards of materials he or she works with.
- Follows safe work practices (including the use of protective equipment and clothing) when working with hazardous materials.
- Actively participates in training concerning hazardous materials.

13.3.5 CEO OSEC Department

- Inspects work areas.
- Helps supervisors conduct or arrange for on-site training for employees.
- Prepares and maintains the Countywide Written Hazard Communication Program.

13.3.6 Facility Manager

- Provides information on hazardous materials to contractors who might encounter such materials while performing maintenance, repairs, or minor construction at the facility.

13.4.1 Determine if There Are Safe Alternatives to Hazardous Materials

Full compliance with hazardous materials regulations can be time consuming and costly. There are a variety of forms, laws, and regulatory agencies that govern the use, storage, and disposal of hazardous materials.

Before committing to a course of action to ensure full compliance with these laws and regulations, supervisors should consider eliminating hazardous materials from the workplace altogether.

Many County operations are reducing or eliminating the use of hazardous materials by:

- Modifying work practices to eliminate the use of hazardous materials.
- Substituting non-hazardous alternatives.
- Contracting out certain occasionally performed tasks that require hazardous materials.

Contact one of the information sources listed at the end of this chapter for advice on how to properly dispose of hazardous materials and how to reduce or eliminate the use of such materials in the future.

13.5 Labels and Signs

13.5.1 Primary Containers

Labeling of chemicals at the County will be in compliance with this written program. Various labels are utilized depending on the type of container.

A primary container is the initial container from the supplier. Primary containers must be labeled with the original supplier container and must contain the six elements required by the Globally Harmonized System (GHS):


- **Product identifier:** The name or number used to identify a chemical. It must match what appears on the chemical's SDS.
- **Signal word:** Use of the word "danger" or "warning" to communicate the severity of the hazard(s) associated with the chemical. Lower hazard chemicals will not include a signal word on the label.
- **Hazard statements:** Standardized phrases used to describe the hazards of the chemicals and, in some cases, the degree of the hazard.
- **Precautionary statements:** Standardized phrases that provide instruction for proper handling of the chemical and/or what to do if exposed to the chemical.
- **Pictogram:** A symbol that provides health, physical and environmental hazard information to those who may be exposed. Each pictogram consists of a symbol on a white background framed within a red diamond border and represents a distinct hazard. See Appendix A for nine standard pictograms that may appear on a hazardous chemical label.
- **Manufacturer or supplier information:** The name, address, and phone number of the company providing the hazardous chemical.

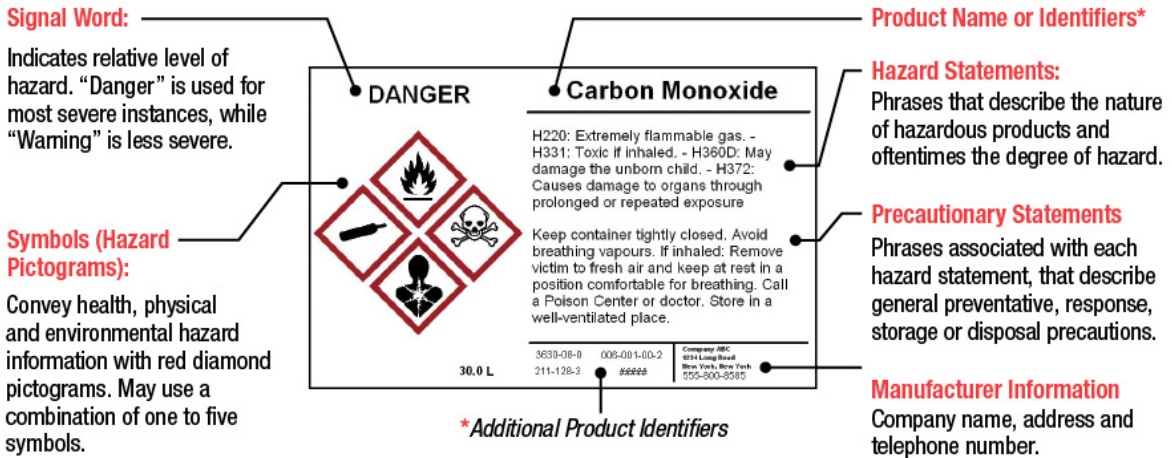
Supervisors must never allow employees to use a hazardous material until:

- 1) The contents of containers are clearly labeled.
- 2) Appropriate hazard warnings are noted
- 3) The name and address of the manufacturer are listed.

Examples of hazardous chemical labels for primary containers containing all six required GHS label elements are below:

SAMPLE LABEL

<p>CODE _____ Product Name _____</p> <p>Company Name _____ Street Address _____ City _____ State _____ Postal Code _____ Country _____ Emergency Phone Number _____</p>	<p>Product Identifier</p> <p>Supplier Identification</p>	<p>Hazard Pictograms</p>  <p>Signal Word Danger</p>	<p>Hazard Statements</p>
<p>Keep container tightly closed. Store in a 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 measures 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.</p> <p>In Case of Fire: use dry chemical (BC) or Carbon Dioxide (CO₂) fire extinguisher to extinguish.</p> <p>First Aid If exposed call Poison Center. If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.</p>		<p>Precautionary Statements</p> <p>Highly flammable liquid and vapor. May cause liver and kidney damage.</p> <p>Hazard Statements</p>	
		<p>Supplemental Information</p> <p>Directions for Use _____ _____ _____</p> <p>Fill weight: _____ Lot Number: _____ Gross weight: _____ Fill Date: _____ Expiration Date: _____</p>	



13.5.2 Secondary Containers

An intermediate container is any container that contains a chemical that is transferred from the original supplier (primary) container or any container used for mixtures of hazardous chemicals. This does not include the container the hazardous chemical was shipped in unless new chemicals were added to it after receipt.

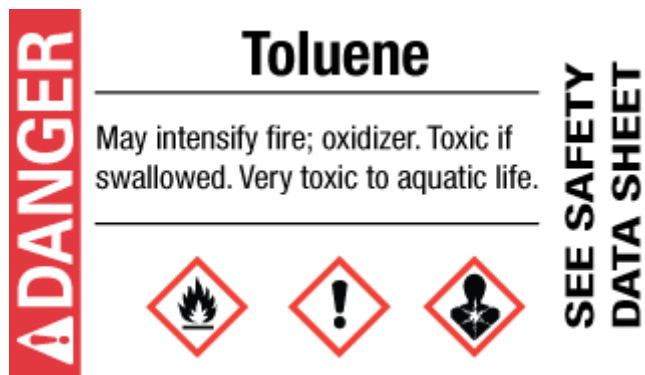
Intermediate containers must be utilized except for the following occasions:

- The material is used within the same work shift as the individual who makes the transfer. If it is not completely used during that same shift, it must be fully labeled with the elements required by the primary container.
- The material is in possession and control of the individual who makes the transfer. If the individual leaves the work area or the material is given to another individual, it must be labeled appropriately using an intermediate label.

Intermediate container labeling must include two key pieces of information:

- **Hazardous chemical identity** (e.g. chemical name). It is important that abbreviations are not used. In case of an emergency, individuals or first responders who do not work in the area may need to know the identity of the chemical.
- **Hazards present.** Health and physical hazards must be communicated using GHS hazard statements, other (clear) hazard statements, the HMIS rating system, an NFPA diamond or a combination of these.
- It is recommended that the name or initials of the owner of the chemical is also provided on the intermediate label.

Below are examples of acceptable intermediate chemical labels with the two required elements:



Department management will provide clear and reasonable warnings to individuals prior to exposure to Proposition 65 chemicals by means of posting signs conspicuously, labeling and employee training.

No label shall be defaced or removed when material is received or in use. Employees should ensure that containers are labeled appropriately and report any deficiencies to their supervisor.

13.5.3 Shipping Labels

Hazardous materials that are shipped and the vehicles that transport them must be labeled according to international guidelines. Vehicles must display placards that contain a four-digit chemical identification code designated by the U.S. Department of Transportation. If you transport hazardous materials in a County vehicle, make sure that the vehicle displays the correct placard.

Note: You must possess a hazardous endorsement on your driver's license, participate in the DMV "Pull Program" and the placarded vehicle needs to be in the CHP "BIT" program to transport placardable amounts of hazardous material.

13.5.4 Unlabeled Pipes

Only employees authorized by GSA shall work on unlabeled pipes that contain hazardous materials. If you are one of these employees, you must contact the GSA plumbing shop for the following information before starting work:

- The hazardous material in the pipe.
- Hazards of this substance.
- Safety precautions you must take.

13.5.5 Warning Signs

1. General. Post warning notices where pesticides or containers labeled "danger" or "warning" are stored. The notices must be visible to anyone approaching the storage area
2. The County has adopted procedures for notifying building occupants when pesticides are used in or around County facilities. These procedures go beyond the requirements of the law and are included in Appendix E. Supervisors are to follow the procedures in Appendix E whenever pesticides will be used to control pests in or around your facility.

13.6 Inventory of Hazardous Substances

Each department supervisor must maintain a current list of all hazardous materials in their workplace. This list can serve as a checkpoint to ensure that all hazardous materials in the workplace have appropriate SDSs and labels. Checklists may be a list of chemicals for the workplace as a whole or for individual work areas.)

The inventory should be kept in front of the SDSs for the department so that it will be readily available to employees (Employees can use the inventory to refer to the specific information on each listed substance from the SDS). Include the following information on the inventory:

- Name of the hazardous material (trade name or chemical name).
- Manufacturer name and address.
- Process or operation where used.

- Check if an SDS is on file (yes/no) or list the date the supervisor requested it.

Supervisors may use the inventory form as provided in Appendix B, or they may use their own inventory sheets.

13.7 Records of Pesticide Use

Supervisors must keep track of your pesticide use, even if such use consists of wiping down a sink daily with a disinfectant. Agriculture laws refer to this as a “Pesticide Use Record”; Cal/OSHA calls it a “Housekeeping Schedule”³. Appendix F contains a generic procedure intended to comply with both the federal and state pesticide use standards. Supervisors must make sure that a record is posted wherever pesticides (including disinfectants) are used.

13.8 Safety Data Sheets

A Safety Data Sheet (SDS) provides information on the safety of a hazardous material. Supervisors can use this information to establish proper work procedures and teach their employees how to handle hazardous materials safely. The law requires Manufacturers to develop SDSs for each hazardous material based on the Hazard Determination Information, and to include the SDS when they ship the product.

13.8.1 Contents

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in uniform format, and include the 16 section numbers, the headings, and associated information under the headings below.

The **16 sections** for inclusion in the SDS are:

1. **Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
 2. **Hazard(s) identification** includes all hazards regarding the chemical; required label elements.
 3. **Composition/information on ingredients** includes information on chemical ingredients; trade secret claims.
 4. **First-aid measures** includes important symptoms/effects, acute, delayed,; required treatment.
 5. **Fire-Fighting measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire.
 6. **Accidental release measures** lists emergency procedures; protective equipment; proper methods of containment and cleanup.
 7. **Handling and storage** lists precautions for safe handling and storage, including incompatibilities.
 8. **Exposure controls/personal protection** lists Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
 9. **Physical and chemical properties** lists the chemical’s characteristics.
 10. **Stability and reactivity** lists chemical stability and possibility of hazardous reactions..
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11. **Toxicological information** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
12. **Ecological information (non-mandatory)** impact of the chemical(s) if it were released into the environment.
13. **Disposal considerations (non-mandatory)** provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices.
14. **Transport information (non-mandatory)** provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, and sea.
15. **Regulatory information (non-mandatory)** identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS.
16. **Other information** includes the date of preparation or last revision.

The law requires Manufacturers to update the SDS within three months of learning that new hazard data is available that affects the SDS information.

13.8.2 Distribution

Supervisors should review incoming data sheets for new and significant health or safety information, and pass any new information on to the affected employees within 30 days.

- Review SDSs for completeness. If an SDS is missing or obviously incomplete, request a new one from the manufacturer.
- Once you are sure an SDS is current and complete, make it available to your employees for review. The easiest way to do this is to place it in a binder and keep the binder easily accessible at the work site.
- Employees should be instructed to immediately notify the supervisor if the employee notices that a SDS is not available or new hazardous materials in use do not have a SDS.

13.8.3 How to obtain an SDS

Procurement will forward copies of any SDS received for products they buy. When you buy a hazardous material directly without going through Procurement you must get your own SDS. To obtain an SDS, call the manufacturer or use the sample SDS request letter provided in Appendix A. Until the SDS arrives, use a copy of the label and any warning as a temporary measure. Ask for an SDS whenever you order a hazardous material. Exception: Some pesticides may not have an SDS. If this is true for a pesticide you use, you must have written documentation from the manufacturer that an SDS is not available, and have either a copy of the pesticide label available, or keep a sheet that includes:

- The trade name (product identity, same as on the label).
- The chemical and common name of each chemical listed on the label.
- Physical and health hazards.
- The precautions necessary for safe handling, use and storage.
- First aid procedures.

Supervisors must make sure that for every hazardous material, a SDS or other required information is kept at the worksite and made available to employees, employee representatives and physicians upon request.

13.9 Trade Secrets

Manufacturers or importers may withhold the specific identity of a chemical if they are protecting a bona fide trade secret and have notified the Director of the California Department of Industrial Relations.

A trade secret cannot include chemical identity information that is already discoverable through laboratory qualitative analysis. All sections of an SDS *except* the specific chemical identity must be completed. The rules provide specific conditions for trade secret release and for holding the information confidential.

Manufacturers or importers must release the actual chemical identity to health and safety professionals (including, in the County's case, ESA Risk Management) under both emergency and non-emergency conditions.

13.10 Pesticide Information Leaflets

The California Department of Pesticide Regulation issues Pesticide Safety Information Series (PSIS) leaflets as a training aid for employers. PSIS leaflets can be accessed at the following website:

<http://www.cdpr.ca.gov/docs/whs/psisenglish.htm> Contact the County Agriculture Commissioner at 918-4600 for more information.

13.11 Hazardous Non-Routine Tasks

During non-routine tasks, you may be exposed to hazardous materials that you are not exposed to during your normal work duties.

An example is an office manager who must contain some liquid toner that spilled from an old copier during an earthquake.

Supervisors should try to anticipate non-routine tasks that may involve exposure to hazardous materials, list those tasks on a separate sheet and place it with the inventory of hazardous materials.

Give employees information about such tasks *before* they begin to do them. This information will include:

- Specific hazards.
- Protective/safety measures.
- Hazard reduction measures the County has taken (such as ventilation, specialized containers, etc.).

13.12 Contractors and Visitors

It is the County's responsibility to protect contract employees (who are under the day-to-day direction of the County) from hazards that are under the County's control.

To ensure the safety of outside contractors working in this facility, it is the responsibility of the County representative to the contractor to provide contractors the following information before they begin their work:

- Hazardous materials to which they may be exposed while on the job site.
- Precautions and appropriate protective measures the workers must take to protect themselves from exposure.
- How to activate the County emergency response system, and emergency procedures to follow, in the event of an accidental exposure or hazardous material release.

Conversely, the work of a contractor may require that measures be taken to protect County employees from hazardous materials under the contractor's control. Therefore, to ensure the safety of County employees, the contractor must provide the cognizant government first line supervisor with the following information:

- Hazardous materials to which County employees may be exposed.
- To supply SDS(s) for hazardous materials used.
- Precautions and appropriate measures County employees should take to lessen the possibility of exposure.
- Emergency and first aid procedures to follow in the event of accidental exposure or hazardous material release.

In addition, outside contractors hired to perform work on or in County facilities must check in with the appropriate Facility Manager, County Building Operations, Facility Maintenance or Construction Services department prior to starting any work.

13.13 Emergency Procedures

In the event that an employee is exposed to a chemical, the following first aid steps must be followed:

For skin exposure:

- Remove contaminated clothing
- Rinse the affected area for 15 minutes

For inhalation exposure:

- Remove to fresh air
- Let someone know you've left
- Breathe deeply

For eye exposure:

- Rinse eyes for 15 minutes at an eye wash
- Hold eyes open

For ingestion exposure:

- Read SDS for first aid
- Do NOT induce vomiting unless recommended
- Seek medical attention

In the event of a chemical spill, employees must follow the guidelines listed below:

For small spills, anything less than 10 ounces, and medium spills, anything ranging from 10 ounces to 5 quarts, employees may clean up the spill if there is no hazard to them and have awareness of the following:

- Know the chemical identity
- Know the chemical hazards
- Wear proper personnel protection

- Have proper spill response supplies
- Place clean up materials in proper waste container

In the event of a small spill, employees can use paper towels to absorb the spilled chemical.

If the spill falls within the medium range, paper towels can be used as needed. If the spill requires more than paper towels to clean up, utilize the items inside the spill kit, absorbent socks and/or kitty litter, that is available onsite.

For large spills, anything over 5 quarts and uncontrolled releases, employees must:

- Evacuate the area immediately
- Secure the area and deny entry
- Call for emergency assistance

Employees must follow the Department hazardous material clean up procedures cleaning. If the spill has an impact on public health or the environment, employees must also contact the County Hazardous Materials department to report the spill and follow any and all instructions they may have.

In case of a chemical fire, all employees must pull the fire alarm station and evacuate the area.

13.14 Training

Supervisors must train (or arrange for someone else to train) their employees how to manage hazardous materials at their work sites. Training must be provided at the time of initial assignment and whenever a new hazardous material is introduced into the workplace.

13.14.1 Training records

Prior to the training, supervisors should prepare (or have the trainer prepare) a training record that includes:

- The date of the training.
- A summary of the training.
- A list of the hazardous materials covered.
- The signatures and job titles of the employees attending.
- The trainer's signature.
- Your signature.
- The names of those employees who were absent.

Keep the training record at the work site for three years, and make it available upon request to employees, their doctors, and employee representatives.

13.14.2 Training Content:

Prior to the training, the instructor must prepare an outline and handouts (if needed). The training must include the following:

- A summary of the requirements of the Hazard Communication Regulation, including information about the Globally Harmonized System.

- The elements of this Written Hazard Communication Program Document.
- Location of SDSs, pesticide information bulletins, and records are kept.
- An explanation of an SDS.
- How to read and understand labels and SDSs, including hazard classifications such as flammable, reactive, etc.
- A review of individual product labels.
- An explanation of the hazard information provided by the SDS for each material employees may be exposed to at the work site.
- Operations at the work site that may expose employees to hazardous materials.
- How to correctly use, store, and dispose of these materials.
- Steps the County has taken to lessen or prevent exposure to these materials.
- Methods and protective equipment that employees can use to lessen or prevent exposure to these materials.
- The importance of washing up before eating, drinking, smoking, applying hand lotion, etc.
- Methods and observation techniques (such as appearance and odor) used to determine the presence or release of hazardous materials in the work site.
- Symptoms of exposure.
- First aid procedures (including decontamination) to follow if employees are exposed to hazardous materials because of spills, fires, etc.
- Emergency and spill clean-up procedures, including locations of fire extinguishers and clean-up equipment.
- How to get medical treatment.
- Non-routine tasks that involve hazardous materials.
- How contractors working on the premises will be informed of hazardous materials they might encounter.
- An explanation of how employees have the right:
 - to personally receive information regarding hazardous materials to which they may be exposed.
 - for their physician or collective bargaining agent to receive information regarding hazardous materials to which the employee may be exposed.
 - against discharge or other discrimination due to the employee's exercise of his or her rights under the Hazardous Substances Information and Training Act.

13.15 Resources

- For technical assistance regarding hazardous materials:

Occupational Safety and Environmental Compliance (OSEC) or County Environmental Health Services

- For loss prevention information:

CEO Insurance

- For information about the application of pesticides and disinfectant cleaners:

County Agricultural Commissioner

- For training information:

Occupational Safety and Environmental Compliance (OSEC)

13.16 Appendices

13.16 Appendix A: Glossary

Acute Effect - An adverse effect on a human or animal body with severe symptoms developing rapidly and coming quickly to a crisis. Also see "chronic."

Acute Toxicity - The adverse (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; an organization of professional personnel in governmental agencies or educational institutions engaged in occupational safety and health programs. ACGIH develops and publishes recommended occupational exposure limits (see TLV) for hundreds of chemical substances and physical agents.

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

API - American Petroleum Institute; voluntary membership organization of the petroleum industry. API publishes recommended practices for industry related design, installation and operating practices.

Asphyxiant - A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen).

ASTM - American Society for Testing and Materials; voluntary membership organization; the world's largest source of voluntary consensus standards for materials, products, systems and services.

Boiling Point - The temperature at which a liquid changes to a vapor state, at a given pressure; usually expressed in degrees Fahrenheit at sea level pressure (760mm Hg, or one atmosphere). For mixtures, the initial boiling point or the boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.

"C" or Ceiling - The maximum allowable human exposure limit for an airborne substance; not to be exceeded even momentarily. Also see "PEL" and "TLV."

CAA - Clean Air Act; federal law enacted to regulate/reduce air pollution. Administered by EPA.

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

C.A.S. - Chemical Abstracts Service; a Columbus, Ohio organization which indexes information published in "Chemical Abstracts" by the American Chemical Society and provides index guides by which information about particular substances may be located in the "Abstracts" when needed. "C.A.S. Numbers" identify specific chemicals.

cc - cubic centimeter; a volume measurement in the metric system, equal in capacity to one milliliter (ml).

CHEMTREC - Chemical Transportation Emergency Center; a national center established by the Chemical Manufacturers Association to relay emergency information during chemical transportation emergencies. (800-424-9300).

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 Toxicity - Adverse (chronic) effects resulting from repeated doses of or exposures to a substance over a relatively prolonged period of time. Ordinarily used to denote effects in experimental animals.

CWA - Clean Water Act; federal law enacted to regulate/reduce water pollution. Administered by EPA.

CO - Carbon monoxide, a colorless, odorless, flammable and very toxic gas produced by the incomplete combustion of carbon; also a by-product of many chemical processes.

CO₂ - Carbon dioxide, a heavy, colorless gas, produced by the combustion and decomposition of organic substances and as a by-product of many chemical processes. CO₂ will not burn, and is relatively non-toxic

13.16 Appendix A: Glossary

(although high concentrations, especially in confined spaces, can create hazardous oxygen-deficient environments).

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

Combustible - certain liquids that will burn, having a flash point of 100°F (37.8°C) or higher. Also see "flammable." Non-liquid substances such as wood and paper are classified as "ordinary combustibles".

Concentration - The relative amount of a substance when combined or mixed with other substances.

Corrosive - As defined by DOT, a corrosive material is a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact or--in the case of leakage from its packaging--a liquid that has a severe corrosion rate on steel.

CPSC - Consumer Products Safety Commission; federal agency with responsibility for regulating hazardous materials when they appear in consumer goods.

Cutaneous Toxicity - See "Dermal Toxicity".

Decomposition - Breakdown of a material or substance (by heat, chemical reaction, electrolysis, decay or other processes) into parts or elements or simpler compounds.

Dermal - Used on or applied to the skin.

Dermal Toxicity - Adverse effects resulting from skin exposure to a substance. Ordinarily used to denote effects in experimental animals.

DHHS - U. S. Department of Health and Human Services.

DOL - U.S. Department of Labor; includes the Occupational Safety and Health Administration (OSHA).

DOT - U. S. Department of Transportation.

EPA - U. S. Environmental Protection Agency.

Epidemiology - The science that deals with the study of disease in a general population.

Evaporation Rate - The rate at which a particular material will vaporize (evaporate).

FDA - The U.S. Food and Drug Administration.

FIFRA - Federal Insecticide, Fungicide and Rodenticide Act; (administered by EPA).

Flash Point - The temperature at which a liquid will give off enough flammable vapor to ignite.

Flammable - a liquid with a flash point below 100°F (37.8°C). Solids that will ignite readily or are liable to cause fires under ordinary conditions are classified as "flammable solids." Also see "combustible."

Formula - The conventional scientific designation for a material (water is H₂O, etc.)

General exhaust - A system for exhausting air from a general work area. Also see "local exhaust."

g - gram; a metric unit of weight. One ounce is about 28.4 grams.

g/kg - grams per kilogram; used in toxicology to indicate the grams of substance per kilogram of body weight.

Hazardous Material - Any substance or mixture capable of producing adverse effects on the health or safety of a human being.

Incompatible - Materials that could cause dangerous reactions from direct contact with one another.

Ingestion - Taking a substance in through the mouth.

13.16 Appendix A: Glossary

Inhalation - Breathing in a substance.

Inhibitor - A chemical that is added to another substance to prevent an unwanted chemical change from occurring.

Internal Standard - A Shell term for an exposure standard.

Irritant - A substance that, by contact in sufficient concentration for a sufficient period of time, will cause an inflammatory response or reaction of the eye, skin or respiratory system. The contact may be a single exposure or multiple exposures.

Irritating - 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).

kg - Kilogram; a metric unit of weight, about 2.2 U.S. pounds.

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

LC - Lethal concentration; a concentration of a substance being tested that will kill a test animal.

LC₅₀ - Lethal concentration; the concentration of a material in air which is expected to kill 50% of a group of test animals when administered as a single exposure (usually 1 or 4 hours).

LD - Lethal dose; a concentration of a substance being tested that will kill a test animal.

LD₅₀ - Lethal dose ; a single dose (by mouth or skin) of a material which is expected to kill 50 percent of a group of test animals.

LEL, or LFL - Lower explosive limit or lower flammable limit of a vapor or gas; the lowest concentration in air that will produce a flash of fire when an ignition source is present.

Local Exhaust - A system for capturing and exhausting air at the point where the contaminants are produced.

m³ - Cubic meter, or stere; a metric measure of volume, about 35.3 cubic feet or 1.3 cubic yards.

Melting point - The temperature at which a solid substance changes to a liquid state. For mixtures, the melting range may be given.

Mechanical exhaust - A powered device, such as a fan, for exhausting contaminants.

mg - Milligram; a metric unit of weight. There are 1,000 milligrams in one gram (g) of a substance.

mg/kg - Milligrams per kilogram; an expression of toxicological dose. See "g/kg".

mg/m³ - Milligrams per cubic meter; a unit for measuring concentrations of dusts, gases or mists in air.

ml - Milliliter; a metric unit of capacity, equal in volume to one cubic centimeter (cc), or about 1/16 of a cubic inch. There are 1,000 milliliters in one liter (l).

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

mppcf - Million particles per cubic foot; was used for measuring particles of a substance suspended in air.

MSHA - The Mining Safety and Health Administration of the U.S. Department of the Interior.

Mutagen - A substance or agent capable of altering the genetic material in a living cells.

NRC - National Response Center; a notification center in the Coast Guard Building in Washington, D.C., with a toll-free telephone number (1-800-424-8802) which must be called when significant oil or chemical spills or other environmentally-related accidents occur.

13.16 Appendix A: Glossary

NFPA - National Fire Protection Association; an international voluntary membership organization to promote/improve fire protection and prevention and establish safeguards against loss of life and property by fire.

Public Health Service - U.S. Department of Health and Human Services (DHHS); federal agency which--among other activities--tests and certifies respiratory protective devices and air sampling detector tubes, recommends occupational exposure limits for various substances and assists OSHA and MSHA in occupational safety and health investigations and research.

Olfactory - relating to the sense of smell.

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

Oral Toxicity - Adverse effects resulting from taking a substance into the body via the mouth.

OSHA - Occupational Safety and Health Administration of the U.S. Department of Labor.

Oxidation - a reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent.

Oxidizer - a substance that yields oxygen readily to stimulate the combustion (oxidation) of organic matter.

Oxidizing Agent - A chemical or substance that brings about an oxidation reaction.

PEL - Permissible exposure limit. May be a time weighted average (TWA) limit or a maximum concentration exposure limit.

% Volatile - Percent volatile by volume; the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature (usually 70°F).

PMCC - Pensky-Martens Closed Cup; a flash point test method.

Poison, Class A - Poisonous gases or liquids of such nature that a very small amount of the gas, or vapor of the liquid, mixed with air is dangerous.

Poison, Class B - Poisons or irritating materials--which are known or presumed to be a hazard during transportation.

Polymerization - A chemical reaction in which one or more small molecules combine to form larger molecules. A hazardous polymerization is such a reaction which takes place at a rate which releases large amounts of energy. If hazardous polymerization can occur with a given material, the MSDS usually will list conditions which could start the reaction and--since the material usually contains a polymerization inhibitor--the expected time period before the inhibitor is used up.

ppm - Parts per million; a unit for measuring the concentration of a gas or vapor in air--parts (by volume) of the gas or vapor in a million parts of air. Also used to indicate the concentration of particular substance in a liquid or solid.

ppb - Parts per billion. Usually used to express measurements of extremely low concentrations of unusually toxic materials.

psi - Pounds per square inch; for MSDS purposes, a unit for measuring the pressure a material exerts on the walls of a confining vessel or enclosure.

Reaction - A chemical transformation or change.

Reactivity - A description of the tendency of a substance to undergo chemical reaction with the release of energy.

Reducing agent - The chemical or substance that combines with oxygen or loses electrons to the reaction.

13.16 Appendix A: Glossary

Respiratory system - The lungs and air passages, plus the associated nervous and circulatory supply.

RCRA - Resource Conservation and Recovery Act; federal environmental legislation, administered by EPA, aimed at controlling the generation, treating, storage, transportation and disposal of hazardous wastes.

Sensitizer - A substance which on first exposure causes little or no reaction in man or test animals, but which on repeated exposure may cause a marked response not necessarily limited to the contact site. Skin sensitization is the most common form of sensitization in the industrial setting, although respiratory sensitization to a few chemicals is also known to occur.

SETA - Setaflash Closed Tester; a flash point test method.

Signal word - A word such as "danger" or "caution" that indicates on a sign or label the degree of hazard.

"Skin" - A notation, sometimes used with PEL or TLV exposure data; 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 Sensitizer - See "Sensitizer".

Skin Toxicity - See "Dermal Toxicity".

Solubility in water - A term expressing the percentage of a material (by weight) that will dissolve in water.

Species - the test animals--usually rats, mice or rabbits--which were used to obtain toxicity test data.

Specific gravity - The weight of a material compared to the weight of an equal volume of water; an expression of the density (or heaviness) of the material.

Stability - An expression of the ability of a material to remain unchanged. For SDS purposes, a material is stable if it remains in the same form under expected and reasonable conditions of storage or use. Conditions which may cause instability (dangerous change) are stated--examples, temperatures above 150°F, shock from dropping.

STEL - Short term exposure limit.

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

TCC - Tag (Tagliabue) Closed Cup; a flash point test method.

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

TLV - Threshold Limit Value; the airborne concentration of a material to which nearly all persons can be exposed day after day, without adverse effects. ACGIH expresses TLV's in three ways:

- 1) **TLV-TWA**: the allowable Time Weighted Average concentration for a normal 8-hour workday or 40-hour work week.
- 2) **TLV-STEL**: the Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided that the daily TLV-TWA is not exceeded).
- 3) **TLV-C**: the Ceiling exposure limit--the concentration that should not be exceeded even **instantaneously**.

TOC - TAG Open Cup; a flash point test method.

13.16 Appendix A: Glossary

Toxicity - The sum of adverse effects resulting from exposure to a material, generally by the mouth, skin or respiratory tract.

Trade Name - The trademark name or commercial trade name for a material.

TSCA - Toxic Substances Control Act; federal environmental legislation, administered by EPA.

TWA - Time Weighted Average exposure; 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, or UFL - Upper explosive limit or upper flammable limit of a vapor or gas; the highest concentration (highest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present. At higher concentrations, the mixture is too "rich" to burn. Also see "LEL".

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

Vapor density - The weight of a vapor or gas compared to the weight of an equal volume of air; an expression of the density of the vapor or gas. Materials lighter than air (vapor densities less than 1.0) will tend to rise and dissipate; heavier vapor and gases are likely to concentrate in low places.

Vapor pressure - The pressure exerted by a saturated vapor above its own liquid in a closed container.

Three facts are important to remember:

1. Vapor pressure of a substance at 100°F will always be higher than the vapor pressure of the substance at 68 F (20°C).
2. Vapor pressures reported on MSDSs in mm Hg are usually very low pressures; 760 mm Hg is equivalent to 14.7 pounds per square inch.
3. The lower the boiling point of a substance, the higher its vapor pressure.

Ventilation - See "general exhaust", "local exhaust" and mechanical ventilation".

13.16 Appendix B: Hazardous Materials Inventory Sheet

Hazardous Materials Inventory for

(work site or area)

SUPERVISORS must keep this list current as new hazardous materials are added to or removed from the work site.

13.16 Appendix B: Hazardous Materials Inventory Sheet

Hazardous Substance	Manufacturer Name/ Address	Process/Operation Where Used	MSDS ?		Date Requested
Yes	No				

13.16 Appendix C: Implementation Checklist

SUPERVISORS can use this checklist to confirm that a Hazard Communication Program is fully implemented at:

(work area)

- Hazardous Substances not essential to this operation have been properly disposed of.
- All hazardous materials at the work site are listed, and the list is kept with the SDSs.
- SDSs for every hazardous material at the work site are kept at the work site.
- Pesticide label for every pesticide used are kept at the work site.
- SDSs, pesticide labels, and records are available to employees, their doctors, and employee representatives.
- All employees have been trained as described in the Training section of this document.
- Training records are complete and current.
- Hazards of non-routine tasks have been listed.
- Hazards of chemicals in unlabeled pipes, if present, have been identified.
- Contract employees have been fully informed and trained as needed.
- Employees have or have access to and use the required protective clothing or equipment.
- Medical supplies and other safety equipment are kept at the work site.

Checklist Completed by:

(name of supervisor)

Checklist reviewed by:

(department head signature)

(date)

13.16 Appendix D: Pesticide Use Record/Housekeeping Schedule

The following guidelines should be followed when pest problems arise in or around County facilities. These guidelines are meant to minimize exposure of County employees to chemicals used for pest management, and to ensure employees receive notification of scheduled chemical applications, over and above safeguards mandated by State regulations.

Department Supervisors and Facility Managers play important, although different, roles in the process. Department Supervisors are responsible to respond to employee concerns, act on complaints about pest problems, notify the Facility Manager when pest problems arise, and meet with employees to advise them in advance of chemical applications and provide information about the chemicals that will be used. Facility Managers responsibilities include tasks involving the facility - coordinating department requests for pest control service, contacting and working with the pest control operator and the IPM Coordinator, providing chemical application information to department supervisors and posting chemical application notices at facility entrances and areas where treatment is to occur. The Facility Manager is also responsible for confirming the requested pest control service was performed, and approving the vendor's invoice for payment. Facility Managers at County owned facilities forward the approved invoice to GSA Building Operations for processing. Facility Managers at leased facilities forward the approved invoice to either the department's fiscal office or to FAF Property Management based on their normal practice.

I. Discovery of Pest Problem

1. Employee(s) notifies his/her supervisor of a suspected pest problem.
2. The Supervisor notifies the Facility Manager of the suspected problem.
3. The Facility Manager meets with the Supervisor and employee(s) to be briefed on specifics of the problem prior to contacting the Pest Control Operator.

II. Identifying Pest and Appropriate Method of Eradication

1. The Facility Manager contacts the County's Pest Control Operator and if necessary the County Intergrated Pest Management Coordinator for a site evaluation.
2. The Pest Control Operator tours site with the Facility Manager to confirm the infestation and identify the pest. The Operator recommends the method of eradication they feel will be the least toxic and most effective. Operator may recommend monitoring the situation if the problem, in their estimation, does not warrant immediate action.
3. If the Operator recommends a chemical application, the Facility Manager asks the Operator for copies of the product label(s) and Safety Data Sheet(s) of all chemicals that will be used, and any additional precautionary information that should be provided to the facility occupants.

The Facility Manager also asks the Operator if they know whether or not the facility's HVAC system should be in operation during or after the treatment to flush out any residual chemical fumes. Facility Managers at County owned facilities contact FAF Building Operations to request any changes, if needed, in the facility's normal HVAC system operation schedule to accommodate the chemical treatment. Facility Managers at leased facilities contact either FAF Property Management or the landlord, based on their normal practice regarding facility issues, to request any necessary HVAC operation schedule changes.

13.16 Appendix D: Pesticide Use Record/Housekeeping Schedule

4. The Facility Manager advises the Department Supervisor of the Operator's recommendation. If the Operator's recommendation includes chemical application, the Facility Manager provides the Department Supervisor with all chemical labels, SDSs and precaution information supplied by the Operator, and also any temporary changes in the facility's HVAC system operation schedule that will be made in conjunction with the chemical treatment. In multi-story or multi-unit facilities the above information shall be provided to all occupant departments.

III. Notification to Facility Occupants of Scheduled Chemical Application

1. Chemical applications should be scheduled immediately prior to weekends or periods when the facility will be unoccupied whenever possible.
2. The Department Supervisor advises employees of the scheduled chemical application and has available chemical labels, SDSs and precautionary information supplied by the Operator.
3. The Facility Manager posts notices at the areas to be treated and at all entrances to the facility advising visitors and occupants of the scheduled chemical application(s). The notices shall indicate the date and time of scheduled application and when it is safe to re-enter the facility. The notices should also identify the pest for which the treatment is being applied, the chemical(s) to be used, and how the chemical(s) will be applied. The chemical label(s), and/or the SDSs, should be posted next to the notices.

The information shall be posted with as much advance notice as possible, but no later than 48 hours prior to scheduled the chemical application and must remain posted for at least 72 hours after the chemical application.

4. The use of baits or other pesticides granted an exemption by the IPM Coordinator shall not be required to post signs as stated in paragraph 3 above. However, each facility that uses pesticidal baits or other pesticides granted an exemption by the IPM Coordinator shall post a permanent sign in each building where such pesticides are used. The sign shall indicate the name of the chemical and the active ingredient of the pesticide used in or around the facility. The sign will also list the target pests, the area or areas where the pesticides are commonly placed, the contact number for the facility manager and the pesticide applicator responsible for the application.
5. When a facility will be treated for pests on a regular basis, notices must be posted prior to each treatment. Those facilities scheduled for quarterly treatments should be posted with new notices prior to each treatment. Those facilities scheduled for monthly treatments can either be posted with new notices prior to each treatment, or posted one time with notices that indicate the day of the month treatment is scheduled for (e.g. the first Friday of every month). The latter method allows for the notices to remain posted from month to month.

Changes in any posted information such as chemical(s) to be used, precautionary information, etc. requires the posting of updated notices.

Resources

The following resources can be contacted for further information or consultation.

- IPM Coordinator- 299-5159
Management Program Oversight

Pest

13.16 Appendix D: Pesticide Use Record/Housekeeping Schedule

Equipment to be disinfected: _____

Tools that will be used: _____

How will tools be protected or disinfected? _____

Names of person(s) responsible for doing the work: _____

Dates the procedure was followed:

Destroy date for this record (two years after final entry): _____

SUPERVISOR completes the following:

I certify that:

- The material Safety Data Sheet (if needed) for this chemical is available to employees doing the work.
- Employees doing the work have been trained in housekeeping procedures and safe use of the chemical.
- Employees have been provided with personal protective equipment as needed.

Name of supervisor: _____

Signature of supervisor: _____