

YORK TECHNICAL COLLEGE CHEMICAL HYGIENE PROGRAM

Revised 5/09 T Barfield

York Technical College is dedicated to ensuring the safety and well being of its faculty, staff and students. This program has been prepared to establish laboratory procedures, practices and policies that will insure that all laboratory workers, and others who may enter the laboratory setting, are protected from potentially hazardous substances associated with laboratory operations. All laboratories using chemicals at any of York Technical College campuses come under the provisions of this plan. The Chemical Hygiene Program developed herein establishes overall organization and supervisory responsibilities to provide a safe working environment. The responsibility for safety rests with the person actively performing the work.

The contents of this document apply to all faculty, staff, and students engaged in the laboratory use of hazardous substances, even in small quantities, for academic purposes. A laboratory is any facility where hazardous chemicals are used in small quantities not on a production basis, to include photo laboratories and other non-conventional laboratory areas.

Purpose

The Chemical Hygiene Program is developed to reduce the significant risks of exposure to hazardous chemicals for employees and students working in laboratories. Occupational Safety and Health Administration (OSHA), Permissible Exposure Limits (PELs), Short Term Exposure Limits (STELs), Threshold Limit Values (TLVS) of the American Conference of Governmental Industrial Hygienists, and RCRA standards must be followed at all times.

Responsibilities

The Environmental/Safety Manager is responsible for the implementation and compliance with the OSHA and RCRA regulations and the contents, implementation and maintenance of this plan.

The Science Department faculty shall be responsible for all chemical hygiene activities in all the Science Departments. The Science Department faculty will do this under the supervision of the department manager and guidance of the Science Lab Coordinator, who will work with the college's Environmental/Safety Manager.

The Environmental/Safety Manager shall

- Work with the College Safety Committee, Science Lab Coordinator, deans, directors and department managers to develop and implement appropriate chemical hygiene practices
- Monitor use and disposal of chemicals used in laboratories
- Ensure that proper audits are maintained and disseminate knowledge of current legal requirements as they pertain to regulated substances
- Provide appropriate training for Science Lab Coordinator
- Maintain all required reports and records required by regulatory agencies
- Continually seek ways to improve the Chemical Hygiene Program

The Science Lab Coordinator shall

- Be responsible for compliance with the Chemical Hygiene Program and maintain compliance with SCDHEC, RCRA, and DOT regulations.
- Provide training to all new employees and current employees.
Maintain current RCRA certification, including DOT requirements for shipping HW
- Advise the Science Department Manager on program needs and determine needed improvements Identify problem areas and the correction process
- Monitor hazardous waste levels weekly
- Conduct annual inspection of all fume hoods to ensure that all are working properly
- Submit hazardous waste reports to SCDHEC as required
- Coordinate the dissemination of information with the Environmental/Safety Manager
- Perform chemical hygiene inspections of all laboratories.
- Inspect and ensure that adequate safety supplies and materials are available in each laboratory.
- Inspect and test safety showers and emergency eyewash stations or arrange for this to occur to ensure that all are working properly

Laboratory Facilities

Appropriate general ventilation shall be available for laboratories and storage areas. Adequate hoods, sinks, eyewash fountains and drench showers shall be present as required. Provisions for hazardous waste accumulation, management, handling, labeling and disposal will be in compliance with Federal, state, and local regulations.

All equipment shall be regularly maintained and continually evaluated for efficiency and safety.

Fume hoods will be tested annually and a report will be filed with the results. The Science Lab Coordinator will maintain the results.

Basic Rules and Procedures for Working with Chemicals

RCRA, Federal, state, and local regulations will be followed when handling all chemicals. **There are special procedures for the management, handling, and disposal of hazardous wastes.**

What is a Hazardous Waste?

A waste is a solid, liquid, or a compressed gaseous material that you no longer use, and store until you have enough to treat or dispose. Certain wastes can cause serious problems if not handled and disposed of carefully. Such wastes could: 1.) cause death or serious irreversible or incapacitating illness; 2.) damage or pollute the land, water, or air. The U. S Environmental Protection Agency (EPA) and the State of South Carolina's Department of Health and Environmental Control (DHEC) have classified hazardous wastes into two categories: (a) characteristic wastes or (b) listed wastes.

York Technical College's Manual for RCRA compliance is housed and is available for review in ST 202 and at <http://www.vorktech.com/science/>. This manual is routinely updated by the Science Lab Coordinator.

Characteristic Wastes

Characteristic wastes are materials that may be hazardous if they have one or more of the following characteristics:

Ignitable waste (Easily flammable with a flash point less than 60° C (140° F)

Corrosive waste (pH less than 2 or greater than 12.5).

Reactive waste (Unstable or undergoes rapid or violent chemical reaction with water or other material and releases toxic gases).

Toxic waste (If an extract from the waste is tested and found to contain high concentration of heavy metals or specific organic compounds that could be released into ground water).

Listed Wastes

Listed wastes: The EPA and DHEC identify approximately 500 chemicals and hazardous wastes by technical name in four (4) different lists. If the name of the waste material generated by your operation appears in any one of these four lists, you must consider the waste as a hazardous waste. Contact the College Environmental/Safety Officer for these lists.

Regulating Hazardous Waste

Regulations pertaining to the disposal of hazardous wastes originate from the Resource Conservation Recovery Act (RCRA). These regulations specify that hazardous wastes can be legally disposed by EPA approved disposal facilities. Hazardous waste generators have direct control over how efficiently hazardous wastes are managed within their laboratories or work-place. Each hazardous waste generator shall properly identify, segregate and temporarily store hazardous wastes. This can help protect their operation from any regulatory actions by the EPA and/or DHEC. EPA and DHEC can levy substantial fines or prison sentences against persons handling and/or disposing of hazardous wastes improperly. The Environmental/Safety Officer of the College and the Science Lab Coordinator will assist College faculty and staff in maintaining compliance with these regulations.

Responsibilities of Hazardous Waste Generators

All personnel generating hazardous wastes have the following responsibilities with regard to hazardous wastes in their laboratory or work-place:

-To select chemicals carefully, become familiar with their individual hazards, and to manage and dispose of all hazardous wastes in compliance with all mandated regulations. **THE PREFERENCE SHALL BE TO AVOID USING HAZARDOUS MATERIALS, AND IF THAT IS NOT POSSIBLE TO DRASTICALLY LIMIT THE AMOUNT USE AND TO KEEP WASTES SEGREGATED.**

-To properly identify, segregate, collect, and label all hazardous wastes.

-To contact the Chemical Hygiene Coordinator if they need containers to collect and store hazardous wastes in their work-place or laboratory.

-To ensure that the hazardous waste containers are always kept closed except when adding waste to or removing waste from the container.

-To ensure that all hazardous waste containers are properly labeled and stored in a safe location.

-To ensure that different waste streams (radioactive, chemical, or biological) will not be mixed together.

-To initiate a meaningful waste minimization plan through substitution, scale reduction, purchase control and/or recycling.

Deciding which wastes are hazardous and which are non-hazardous can present some difficulties. It is the responsibility of the generator to make the determination if their wastes are hazardous. If you need assistance, contact the Chemical Hygiene Coordinator.

Collecting and Storing Hazardous Waste

Hazardous waste liquids must be collected in shatter proof containers. Each container must be properly identified as to its contents.

The hazardous waste must be properly labeled. This must include approximate quantities of each material present. You must use the chemical name or the trade name, not chemical formula or any other abbreviation.

-Do not mix dissimilar waste streams (e.g., organic solvents and aqueous solutions). To save money, consolidate similar waste streams whenever possible. Do not contaminate organic solvents with aqueous solutions. Waste organic solvents containers with more than one layer will not be accepted for disposal.

-Every hazardous waste container must be closed and sealed with a proper lid, at all times. Containers closed with rubber stoppers, corks, or para-film wrappers are not acceptable.

-Do not fill liquid waste receptacles to more than 80% capacity. This is to prevent spillage out of containers. The top and sides of the container must be free of hazardous waste residues.

-Contaminated solid waste materials like gloves, paper towels and glass rods may be collected in cardboard boxes and/or plastic containers. All needles, syringes, and razors must be placed in containers specifically designed for sharp objects. Never use the liquid waste container to dispose of such contaminated solid wastes.

-Pipettes and other glassware must be placed in separate containers provided by the Science Department and discarded like regular household trash, unless contaminated with extremely toxic compounds. Contact the Science Lab Coordinator if you need any additional information

Labeling Hazardous Waste Containers

To comply with applicable Federal and State regulations, every hazardous waste container must be tagged properly. The following information must be provided by the generator on each label. Labels can be obtained from the Science Lab Coordinator.

-Name of faculty member or originator.

-Names of chemical(s) inside the container.

-Quantity (in pounds or grams for solids, and in ounces or gallons for liquids).

- Type waste (ignitable, corrosive, reactive, toxic).

_Beginning accumulation date (date that the HW was first generated).

NOTE: PLEASE INFORM SCIENCE LAB COORDINATOR WHEN ANY HW IS PRODUCED, TO FACILITATE PROPER STORAGE.

The above information must be provided to the hazardous waste disposal contractor. This information will help the hazardous waste contractor to plan packing requirements prior to arriving at our accumulation point.

Unknown Hazardous Waste Materials

Hazardous waste management regulations specifically prohibit transportation, storage, and disposal of unknown waste materials. For this reason, unknowns cannot be accepted. The generation of unknown wastes can be prevented if proper management practices are in place at your laboratory or work-place. Should you need assistance in properly identifying your unknowns, the Science Lab Coordinator may be able to guide you in the proper direction.

Waste Minimization / Source Reduction

Waste Minimization

With a little planning, the amount of hazardous wastes generated can be reduced. Waste minimization results in lower disposal cost and fewer regulatory constraints. All hazardous waste generators must implement the following methods at their worksite to minimize the amount of hazardous waste generated by their operation.

Substitution -Whenever possible, substitute hazardous materials with less hazardous ones.

Scale Reduction-Micro-scale experiments are becoming popular not only in research laboratories but also in teaching laboratories. Scale reduction of experiments and procedures will reduce the quantity of hazardous waste generated.

Controlling the Purchase of Hazardous Materials-When considering this specific "waste stream," there are two separate costs involved: the cost of the unused chemical(s) and the cost associated with the disposal of the chemical(s) as a hazardous waste. Although initially it may be cheaper to buy hazardous materials in large quantities, the costs associated with the disposal of the subsequent waste (i.e., hazardous waste) are very high. Proper planning can control the amount of chemicals purchased and effectively reduce the amount of hazardous waste generated.

Online Safety Training: http://ehs.sc.edu/training/online_list.htm

Online Safety Resources: <http://ehs.sc.edu/sites.htm>

Reference: Section D.6, University of South Carolina Safety Program Guide, <http://ehs.sc.edu/laboratory.htm> . University of South Carolina. December 8, 2003.

Chemical Spills

Note: MSDS are available at <http://www.yorktech.com/science/> and can be accessed in every laboratory. Proper spill methods should be reviewed prior to using a chemical.

Eye contact- promptly flush with water for at least 15 minutes and then seek medical attention.

Skin contact- promptly flush with water, remove any contaminated clothing, and seek medical attention.

Ingestion- drink a large amount of water and seek medical attention. Eating, drinking, smoking, gum chewing, and the application of cosmetics in areas of laboratories where chemicals are present is prohibited. Hands should be washed prior to these activities. Food and beverages shall not be stored in refrigerators or utensils that are used for laboratory operations.

A spill shall be promptly confined by using provided spill containment kits.

All nonessential and unprotected personnel shall leave or be removed from the area, undergo decontamination by washing or showering, and discard any contaminated clothing.

If the spill is flammable, turn off electrical and flame sources but maintain ventilation if possible.

Clean-up personnel should don appropriate protective equipment, including a respirator if indicated. Clean up and neutralization procedures (see MSDS) for the specific spill shall be reviewed.

At least two protected individuals should be present prior to proceeding so that there is backup available. Use appropriate neutralizing or absorptive agents. Commercial spill kits are located strategically in each lab. Cover solid material with moistened (by water or appropriate solvent) paper towels. DO NOT DRY SWEEP.

Perform clean up. Then re-neutralize (or disinfect) and re-clean. Prevent aerosol formation.

If the spill is infectious, contain and absorb as much as possible and flood with a 10% percent bleach solution.

All spills of hazardous substances shall be reported to the Environmental/Safety Manager.

Each laboratory shall develop and maintain specific clean up SOPs for the most likely spill risks.

Preventative Procedures

Do not use damaged equipment or glassware.

Use equipment only for its designated purposes.

Inoperative equipment should be clearly labeled to prevent use.

All contaminated items must be removed prior to exiting the laboratory.

All exposed skin must be thoroughly washed.

Laboratory coats shall not be worn outside the laboratory.

Practical jokes and horseplay are prohibited in laboratories.

Mouth pipetting and suctioning is prohibited.

Long hair and loose clothing must be confined.

Closed-toe shoes shall be worn; sandals or perforated shoes are not permitted during lab exercises.

Work areas shall be kept clean and uncluttered.

Appropriate eye protection, skin protection and protective clothing aprons shall be worn.

Contact lenses should be avoided.

All personnel should be alert to unsafe conditions and assure prompt correction.

Waste shall be deposited in appropriately labeled receptacles and in accordance with the established procedures.

Chemical Hygiene Support Activities

When a hazardous substance is received, those who will be involved with the material shall know information on proper handling, storage and disposal. The date of the container's arrival must be placed on its label. A Material Safety Data Sheet (MSDS) shall be on file in the laboratory and in the Environmental/Safety Office, and MSDS information must be added (if not already present) to York Technical College's online MSDS program available at <http://www.yorktech.com/science/>.

No container shall be accepted from the vendor without a proper identification label, and an MSDS, if one is not on file.

Chemicals whose containers have been opened shall be stored in an area with local exhaust ventilation and in appropriate storage cabinets.

Stored chemicals shall be examined annually for replacement, deterioration and container integrity.

Amounts of storage permitted in laboratories shall be as small as practical.

Storage on bench tops is not permitted.

Storage in fume hoods shall be minimized.

Flammable substances shall be stored in the laboratory only in minimal quantities, preferably in metal safety cans or plastic-encased containers. No instance shall those amounts specified by the fire code be exceeded. Larger amounts must be kept in approved flammable storage cabinets, not exceeding five gallons per 400 square feet. Bulk storage and all drums must be stored in a central approved flammable storage room, preferably outside the building, but with at least one vented outside wall. When transferring flammable liquids from bulk the containers shall be grounded.

Compressed gas cylinders shall always be transported using a hand truck and with the valve cap in place and chained. All cylinders in laboratories shall be strapped or chained in place at bench top level. Exposures of compressed gas cylinders to excessive heat or direct sunlight shall be avoided.

The Science Lab Coordinator shall conduct semi-annual inventories of chemicals with unneeded items being discarded.

Copies of completed inventories shall be forwarded to the Environmental/Safety Manager.

Housekeeping, Maintenance and Inspections

The Environmental/Safety Manager and the Science Lab Coordinator shall conduct formal housekeeping and chemical hygiene inspections. All inspections shall be documented on an inspection checklist showing: (1) location, (2) date of inspection, (3) findings, (4) recommendations, and (5) name of inspector(s).

Physical Plant will handle maintenance of any laboratories.

The department chemical hygiene coordinator and monthly by the Environmental/Safety Manager shall test safety showers weekly. Other safety related equipment should be inspected monthly.

All inspections shall be documented showing:

Lab Location

Date of inspection

Type of equipment

Deficiencies noted

Corrective action taken

Name of inspector

Medical Surveillance Program

Medical surveillance shall be in accordance with 29 CFR 1910.1450. The employer shall maintain for each employee a record of any monitoring of employee exposures and any medical examinations or consultations. The records of medical surveillance will be maintained in the employee's file in Human Resources for a period up to 30 years after employment.

Establishment

The Medical Surveillance Program shall be the responsibility of the Environmental/Safety Manager.

When an employee develops signs or symptoms associated with a hazardous chemical, the employee shall be provided an opportunity for a medical examination.

When exposure monitoring reveals a level above the action level, PEL or STEL, for an OSHA regulated substance; medical surveillance shall be established.

When a spill occurs with possible personnel exposure, the affected employees shall be provided an opportunity for medical examination.

Monitoring

The physician shall be provided with the following:

- The identity of the chemical
- A description of the circumstances
- The signs and symptoms of the employee

The physician shall provide the college with the following:

- Recommendations for further medical follow-up
- The results of the examination and testing
- Any medical condition found which might place the employee at increased risk
- A statement that the employee has been fully informed

Lab Equipment An easily accessible drench-type safety shower will be installed An eye wash fountain or similar device for flushing the eyes will be available An ABC-type fire extinguisher will be available Fire alarm in close proximity Telephone for emergency use Other equipment designated by the Environmental/Safety Manager.

Recordkeeping

Accident, injury or exposure records shall be in writing and kept on file by the Environmental/Safety Manager.

Chemical Hygiene Plan records shall show documentation that facilities and precautions are compatible with current knowledge and regulations. The college, in accordance with current statutes, shall retain medical records.

Signs and Labels

Signs and labels are available from the Environmental/Safety Manager. The department chemical hygiene coordinator will insure that each laboratory prominently post signs and use labels as follows:

- Post emergency telephone numbers of Public Safety.
- Use labels showing the contents of each container (including waste receptacles). The label shall also show the telephone number of the manufacturer, the physical hazards, health hazards, required protective equipment, and special storage and handling instructions.
- Post location signs for safety showers, eyewash stations, first aid equipment, and exits.
- Post warning signs at areas or equipment where special or unusual hazards exist.
- Ensure that evacuation routes are prominently displayed.

Emergencies, Spills and Accidents

In the event of a fire, pull the nearest fire alarm and evacuate the building.

Contact Public Safety at extension 8013 and report the fire.

- Provide the building and room location
- Provide the chemical and/or material involved

If a medical emergency occurs, contact Public Safety at extension 8013 for assistance.

If trained, provide emergency first aid treatment.

Any spills in the lab must be reported to the Environmental/Safety Manager.

Any spills must be cleaned up and waste disposed in a manner specified by SC DHEC, OSHA or EPA.

All accidents or near accidents shall be reported to the Environmental/Safety Manager for investigation.

Disposal of Hazardous Waste from Labs

all chemicals shall be transported off campus for appropriate disposal. The following items are guiding principles regarding hazardous waste disposal.

Laboratory waste disposal procedures shall, at a minimum, include

- How waste is to be collected
- How waste is to be segregated
- How waste is to be labeled and stored
- How waste is to be transported (on' campus)
- The definition and classifications of the various types of waste

Unlabeled containers of chemicals and solutions shall be disposed of promptly.

Fume hoods shall not be used as a means for disposal for volatile liquids.

Training Programs

The Environmental/Safety Manager shall be responsible for acquisition and dissemination of regulatory and technical information on the Chemical Hygiene Program, provide literature and consultation, and to provide education programs for Department Chemical Hygiene Coordinators.

Each employee has a "Right to Know" concerning the hazards of working with chemicals in the laboratory work place. This Hazard Communication Standard is set forth in 29 CFR 1910.1200. This "Right to Know" applies to any person who comes in contact with any hazard. The department heads for Biology and Physical Sciences shall assure that each employee shall be informed of the "Right to Know" prior to commencing work in any lab.

Each Laboratory will obtain and maintain the Material Safety Data Sheets (MSDS) for every hazardous chemical used.

Each employee shall receive information at the time of initial assignment concerning the hazards of the work performed in the laboratory and all applicable chemical safety procedures. They shall be informed of the location of the Chemical Hygiene Plan, where the MSDS and safety procedures are kept, and how to access the information. They shall be informed of the permissible exposure limits, the signs and symptoms of exposure to hazardous chemicals, and the location of reference materials. Training programs shall be a regular and continuing effort on an annual basis.

Training shall include the following:

- methods and observations to detect release of hazardous chemicals
- the control of physical and health hazards
- measures which may be taken for employee protection

All training will be documented and maintained in a file by the Environmental Safety Manager.

Plan Review and Update

This plan will be reviewed and updated annually by the Science Lab Coordinator of York Technical College.

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