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ADMIN RECORD

SW-A-004061

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Air Emissions

School operations which generate certain air emissions may be regulated by state and federal law. Specific categories of regulated air emissions and related institutional control procedures are as follows:

1. Boiler Combustion Exhaust -- The School's backup steam generation boiler does not require the filing of an Air Pollution Emission Notice (APEN) and is exempt from permit requirements if the following operating conditions are met:

   a. Consumption of natural gas does not exceed 19,250 standard cubic feet (SCF) per hour and 9.7 million SCF per year.

   b. Visible emissions do not exceed 20% opacity.

   In order to ensure that the aforementioned operating limits are not exceeded, Plant Facilities shall implement the following control procedures:

   a. Operation of the backup boiler is limited to not more than 3 weeks per year at not more than 50% operating capacity. If exceedance of these operating limits is anticipated, Plant Facilities shall notify the EHS office as far in advance as possible. The EHS office will file an APEN and request an operating permit if boiler operations are anticipated to exceed the aforementioned limits.

   b. Plant Facilities shall maintain an operating record for the boiler which indicates: time of operation; operating capacity, and rate of consumption of natural gas.

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c. Plant Facilities shall notify the EHS office of any significant changes to boiler equipment which would effect air emissions.

2. Vehicle Exhaust -- Plant Facilities arranges for annual air pollution control inspection and certification of State-owned vehicles which are operated by School employees. All State-owned vehicles operated by CSM personnel must have a current Air Pollution Control Permit.

3. Asbestos -- Visible emissions of asbestos are prohibited in accordance with the "National Emission Standard for Hazardous Air Pollutions".

4. Radioactive Materials -- Release of radioactive materials into the air shall not exceed the limits set forth in Part IV of State of Colorado Rules and Regulations Pertaining to Radiation Control. A copy of these regulations is maintained in the EHS office.

5. Ozone Depleting Chemicals -- Chlorofluorocarbons (CFCs) -- The School will conform with provisions in Regulation No. 15 which is promulgated by the Colorado Air Quality Control Commission.

   a. Halon Fire Extinguishers -- Acquisition of Halon fire extinguishers is prohibited unless special case approval is granted by the EHS office.

   b. Intentional Venting of CFCs -- Intentional venting of CFCs from any CSM-owned equipment is prohibited.

   c. Registration of Stationary Appliances -- Plant Facilities shall immediately notify the EHS office of the installation of stationary air-conditioning appliances which exceed 100 compressor horsepower. The EHS office will register such appliances with the Colorado Department of Public Health and Environment. Plant Facilities shall maintain ozone depleting chemical tracking logs for registered stationary appliances. Plant Facilities shall also perform required maintenance for registered stationary appliances.

   d. Refrigerant Recovery -- Plant Facilities shall utilize appropriate equipment to recover and recycle refrigerant which is extracted from vehicle air-conditioners, refrigerators, portable air-conditioners and stationary sources. No CFC containing equipment may be scrapped or discarded until the refrigerant is removed.

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e. Technician Training -- All Plant Facilities maintenance personnel who service stationary air-conditioning appliances or motor vehicle air-conditioning appliances must be registered and certified. The EHS office will pay for technician training and registration. The EHS office will initiate annual certification and renewal for Plant Facilities maintenance personnel.

6. Hazardous Waste Disposal -- Disposal of a hazardous waste (as defined in the Resource Conservation and Recovery Act) by evaporation to the air or by burning is strictly prohibited.

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Employee Training

Training requirements for employees are dependent upon occupation of the employee. Types of training which are provided for School employees include:

1. OSHA Hazard Communication Training (Right-to-Know) -- This training is required for classified staff employees who handle chemicals as part of their occupation. All Plant Facilities personnel are required to attend Right-to-Know Training at least once. The EHS office offers this training to all classified staff members on an annual basis.

2. OSHA Laboratory Chemical Hygiene Training (Laboratory Right-to-Know) -- Attendance at this training class is required at least once for all faculty, staff and graduate students who handle chemicals in research labs. The EHS office offers the training each semester.

3. Hazardous Waste Generator Training -- All campus personnel who procure, use, store or handle chemicals are required to attend Hazardous Waste Generator Training. Graduate students and classified staff members must attend annually. Faculty members must attend at least once. The EHS office offers this training each semester. The EHS office will not accept waste disposal requests originated by persons who do not have current Hazardous Waste Generator Training. Similarly, the staff of the Central Chemical Storage and Distribution Facility will not accept requests to procure chemicals from persons who do not have current Hazardous Waste Generator Training.

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4. Lead Management Training -- All Plant Facilities personnel who may encounter lead construction materials during the course of their work must attend at least one lead management class. This training is offered by the EHS office on an annual basis.

5. Confined Space Entry Training -- All Plant Facilities personnel who may be required to enter a "confined space" (as defined by OSHA) are required to attend a Confined Space Entry class on an annual basis. The EHS office provides this training on an annual basis.

6. Forklift Truck Operator Training -- All campus personnel who operate forklift trucks must receive formal training prior to using forklift trucks. After an employee has received this training, the supervisor issues a letter to the employee which authorizes the employee to operate a forklift truck. Sample authorization letters are available in the EHS office.

7. New Employee Training -- Supervisors of new employees whose work involves handling chemicals, use of personal protective equipment, operation of industrial machinery, power tools or vehicles must provide introductory training to the new employee. The supervisor must document the training. This requirement applies to temporary student employees.

8. Radiation Safety Training -- Faculty members who supervise the use of radiation-producing equipment are responsible to provide appropriate training to faculty, staff and students who utilize this equipment. Faculty members who supervise "Direct Supervised Users" in the use of radioisotopes are responsible to provide training to persons in this user category. "Independent/Supervisors Users" must receive 10 hours of Radiation Safety Training before they are qualified to function in this user category. The EHS office provides this training once per semester. (See Section F-10 for additional information concerning Radiation Safety Training).

9. First Aid/CPR Training -- At least one person in each work unit or in mobile crews which operate independently must have current First Aid/CPR Training. All employees are encouraged to receive this training. The EHS office provides this training at least once per semester.

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10. General Industrial Safety Training -- The EHS office will provide one annual training class for Plant Facilities employees on selected topics in this category. Topics in this category include: Use of Personal Protective Equipment; Machine Guarding; Lock Out/Tag Out Procedures; Trench Shoring; Use of Fire Extinguishers; Ergonomics; Proper Lifting Technique; Noise/Vibration Hazards, etc....

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Statement of Authority and Purpose

This policy is promulgated by the Board of Trustees of Colorado School of Mines, hereinafter the "Board," pursuant to the authority conferred by §23-41-104(1), C.R.S. (1988). The purpose of this policy is to set forth an authoritative statement of the Board regarding indemnification of officers, employees, and agents of Colorado School of Mines, hereinafter "CSM," who may suffer damages while performing their duties in good faith. This policy shall supersede any previously promulgated CSM policy which is in conflict herewith and may be revoked by a majority vote of the Board without prior notice.

Introductory Statement

The Board is cognizant of the fact that personal liability, including monetary damages, fines, and incarceration, may be imposed under certain circumstances upon officers, employees, and agents of entities found to be in violation of environmental statutes regardless of the intent of the parties involved. In light of these risks, the Board realizes that an additional cost must be incurred to attract and retain the highest qualified management personnel to lead its environmental compliance effort. Accordingly, the Board has adopted the policy set forth herein on the date indicated below.

Policy

CSM shall indemnify an officer, employee, or agent of CSM, hereinafter the "Indemnified Party," for the cost of reasonable expenses and attorney fees as well as any civil or criminal fines or monetary damage which have been imposed upon the Indemnified Party by a public enforcement agency under authority conferred by an environmental protection statute, if the following conditions are met:

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Date of Last Revision: May 1998

APPROVED: Robert Moore — May 29, 1998
Robert Moore, Vice President for Business Affairs — Date

Fundamental Concepts

Risk management functions must be integrated into daily operations of all CSM organizational subunits. Responsibility/authority for carrying out risk management functions follows the existing administrative chain. Department Heads/Directors are the principal risk managers for their respective organizations.

RESPONSIBILITIES

Category	Function	Primary	Secondary
ADA Issues	Coordination of employment and academic accessibility issues related to ADA.	Director of Human Resources	Plant Facilities Director
ADA Issues	Coordination of facility accessibility issues related to ADA.	Plant Facilities Director	Director of Human Resources
Air Quality	Investigation/correction of indoor air quality complaints arising from design/operation of HVAC systems or use of furnishings, construction materials or cleaning chemicals which contain volatile irritants.	Plant Facilities Director	EHS Director

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Air Quality	Investigation/correction of indoor air quality complaints arising from occupant exposure to chemical or biological agents, radon, PCB's, lead, asbestos and tobacco smoke.	EHS Director	Plant Facilities Director
Alarm Response	Manage contract and coordinate administrative issues with Central Alarm Monitoring Service.	Plant Facilities Director	EHS Director
Alarm Response	Responsible for alarm system design, maintenance and operation.	Plant Facilities Director	EHS Director
Alarm Response	Serve as primary point of contact for the Central Alarm Monitoring Service. Receive first notification of alarm activation.	Public Safety Director	EHS Director
Alarm Response	Provide on-scene incident management and operational coordination with fire department in response to fire alarms.	Public Safety Director	EHS Director
Alarm Response	Respond to the scene of all fire alarms and elevator alarms.	Public Safety Director	EHS Director
Alarm Response	Investigate and attempt to reset after-hours fire system trouble alarms. Utilize Plant Facilities call-out sheet for after-hours technical assistance.	Public Safety Director	Plant Facilities Director

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Alarm Response	Receive default autodialer notification of after-hours critical building system alarms. Utilize Plant Facilities call-out sheet for after-hours technical assistance.	Public Safety Director	Plant Facilities Director
Alarm Response	Receive notification of alarm activation and respond to all alarms during working hours. Provide after-hours technical assistance upon request by Public Safety.	Plant Facilities Director	EHS Director
Alarm Response	Receive notification of alarm activation during working hours. Investigate and report on the circumstances associated with fire alarms and alarm incidents which involve hazardous materials.	EHS Director	Public Safety Director
Alarm Response	Respond to the scene of all actual fires and alarm incidents which involve hazardous materials. Provide after hours technical assistance upon request by Public Safety.	EHS Director	Public Safety Director
Alarm Response	Initiate and coordinate building evacuation drills.	EHS Director	Public Safety Director
Asbestos	Provide asbestos team manpower for entry into contaminated areas and control/ removal of minimum quantities of asbestos associated with emergency repairs.	Plant Facilities	EHS Director
Asbestos	Plant Facilities asbestos team training and general awareness training.	EHS Director	Plant Facilities Director

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Asbestos	Coordination of asbestos abatement scheduling and contracts related to capital construction projects.	Plant Facilities Director	EHS Director
Asbestos	Coordination of other asbestos abatement projects including coordination of contracts for abatement and industrial hygiene services.	EHS Director	Plant Facilities Director
Asbestos	Pay for asbestos abatement/ repair projects necessitated by damage to asbestos material.	EHS Director	Plant Facilities Director
Asbestos	Pay for asbestos abatement projects necessitated by equipment repair, replacement, remodel and new construction.	Plant Facilities Director	EHS Director
Building/Facility Maintenance	Maintenance/test/inspection of fire and life safety equipment and systems.	Plant Facilities Director	EHS Director
Building/Facility Maintenance	Coordinate inspection/test/ repair of pressure vessels which are integral to building systems.	Plant Facilities Director	EHS Director
Building/Facility Maintenance	Coordinate inspection/test/ repair of elevators.	Plant Facilities Director	
Building/Facility Maintenance	Building, Plumbing, Mechanical and Electrical Code compliance.	Plant Facilities Director	EHS Director

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Environmental and Occupational Health and Safety	Environmental and Occupational Health and Safety code compliance, investigation, inspection and enforcement (ACGIH, OSHA, RCRA, CERCLA, TSCA, NPDES). Coordination with local, state, and federal agencies.	EHS Director	
Environmental and Occupational Health and Safety	Radiation Safety.	EHS Director	
Environmental and Occupational Health and Safety	Medical surveillance.	EHS Director	
Environmental and Occupational Health and Safety	Signage related to hazardous materials, equipment, or processes.	EHS Director	Plant Facilities Director
Environmental and Occupational Health and Safety	Maintenance of walking/ working surfaces.	Plant Facilities Director	EHS Director
Fire and Life Safety	Remodel/new construction, plan review for building, fire and life safety code compliance.	Plant Facilities Director	
Fire and Life Safety	Fire and Life Safety Code interpretation, inspection and enforcement. Coordinate with local fire officials.	EHS Director	Plant Facilities Director

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Fire and Life Safety	Accomplish annual inspection, hydrotest, refill and repair of portable fire extinguishers in Campus buildings (excluding Student Life buildings*).	EHS Director
Fire and Life Safety	Provide initial supply of portable fire extinguishers and replace missing or condemned extinguishers in campus buildings (excluding Student Life buildings*).	Plant Facilities Director
Fire and Life Safety	Provide monthly inspections of portable fire extinguishers in campus buildings (excluding Student Life buildings*).	Plant Facilities Director
Fire and Life Safety	Accomplish inspection and maintenance of the dry chemical fire suppression systems in the Hazardous Materials Management Facility (HMMF) and the Chemical Storage and Distribution Facility (CSDF).	EHS Director
Fire and Life Safety	Accomplish inspection and maintenance of installed fire detection and suppression systems in campus buildings (excluding the Computing Center, EHS chemical storage facilities and Student Life buildings*).	Plant Facilities Director

- The Director of Student Life retains responsibility for the inspection and maintenance of installed fire detection and fire suppression systems in the Student Center and Residence Life buildings. Student Life is also responsible for the inspection, maintenance and replacement of portable fire extinguishers in those buildings. The Director of the Computing Center retains responsibility for the inspection and maintenance of the Halon fire suppression system in the Green Center.

Fire and Life Safety	Implement improvements and modifications to campus facilities and building systems related to Fire and Life Safety Code compliance.	Plant Facilities Director	EHS Director
Miscellaneous	Pre-employment screening/ testing. Drug/alcohol testing.	Director of Human Resources	
Property Loss and Liability Insurance/ Claims	Management/administration of property loss insurance. Coordination with State Risk Management Office & individual insurance carriers.	Purchasing Director	
Property Loss and Liability Insurance/ Claims	Property loss insurance compensation for losses associated with theft, vandalism, etc.	Purchasing Director	
Property Loss and Liability Insurance/ Claims	Reporting of auto accidents to State Risk Management.	Purchasing Director	
Property Loss and Liability Insurance/ Claims	Determination of adequacy of insurance for rental vehicles.	Purchasing Director	
Property Loss and Liability Insurance/ Claims	Filing of liability claims with State Risk Management.	Purchasing Director	
Property Loss and Liability Insurance/ Claims	Yearly report of values of building and building contents to State Risk Management.	Purchasing Director	Plant Facilities Director
Public Health and Safety	Investigation of fatal accidents, accidents with multiple victims or serious injuries, accidents involving vehicles, and accidents which may involve criminal activity.	Public Safety Director	EHS Director

Public Health and Safety	Bomb threats, civil defense, traffic/pedestrian safety, criminal investigations, emergency planning for natural disasters.	Public Safety Director	EHS Director
Public Health and Safety	Emergency planning for chemical releases.	EHS Director	Public Safety
Public Health and Safety	Management of public health and sanitation issues which affect employees.	EHS Director	Plant Facilities Director
Public Health and Safety	Drinking water, cross connections, and swimming pool maintenance and water quality.	Plant Facilities Director	EHS Director
Public Health and Safety	Installation and maintenance of exterior campus lighting/ signage.	Plant Facilities Director	
Public Health and Safety	Assessment and reporting of needs for improvement/ modification of campus lighting/signage related to security and public access.	Public Safety Director	EHS Director
Public Health and Safety	Control of fire lane access for emergency vehicles.	Public Safety Director	EHS Director
Workers Compensation	Management/administration of Workers Compensation Insurance. Coordination with State Risk Management Office. Develop and implement light duty procedures. Workers Compensation claims management/investigation and follow-up.	Director of Human Resources	EHS Director

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Policy

CSM shall indemnify an officer, employee, or agent of CSM, hereinafter the "Indemnified Party," for the cost of reasonable expenses and attorney fees as well as any civil or criminal fines or monetary damage which have been imposed upon the Indemnified Party by a public enforcement agency under authority conferred by an environmental protection statute, if the following conditions are met:

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1. Throughout the course of the matter, the Indemnified Party was acting in the course and scope of his or her employment in a manner the Indemnified Party reasonably believed to be in the best interests of CSM;

2. Throughout the course of the matter, the Indemnified Party was acting in good faith;

3. Throughout the course of the matter, the Indemnified Party was not acting with specific intent to violate environmental laws, nor in reckless disregard of the consequences of his or her behavior; and

4. The Indemnified party has given CSM prompt notice of the facts and circumstances surrounding the matter for which indemnification is sought as well as a reasonable opportunity to participate in the Indemnified Party's response to or defense of the matter, provided that such notification shall not be required if there is a conflict or the potential of a conflict between the interests of the Indemnified Party and CSM.

CSM shall not terminate, suspend, discipline, reprimand, or take any other adverse employment action against an Indemnified Party based upon sanctions imposed upon the Indemnified Party or CSM by a public enforcement agency under authority conferred by an environmental protection statute, if the following conditions are met:

1. Throughout the course of the matter, the Indemnified Party was acting in the course and scope of his or her employment in a manner the Indemnified Party reasonably believed to be in the best interests of CSM;

2. Throughout the course of the matter, the Indemnified Party was acting in good faith; and

3. Throughout the course of the matter, the Indemnified Party was not acting with specific intent to violate environmental laws, nor in reckless disregard of the consequences of his or her behavior.

Nothing in this policy shall be interpreted as prohibiting a supervisor or other appropriate authority from disciplining an Indemnified Party for performance reasons unrelated to those enumerated herein, including, but

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not limited to, carelessness or negligence in the discharge of his or her duties.

Nothing in this policy shall be interpreted as enlarging the scope of the liability of CSM to third parties beyond the limits imposed by the laws of the State of Colorado and other applicable statutes.

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The Colorado School of Mines is an academic institution devoted to the education and training of future professionals in business, mining, industry, and government. That education must include appropriate professional training in related fields of environmental and occupational health and safety. It is incumbent upon the School to set an example for students by both word and action in providing an organizational model of an effective environmental and occupational health and safety program. Therefore, the School will integrate environmental health and safety functions into all institutional operations including teaching, research, physical plant maintenance, and internal administration.

The School will pursue a prudent and reasonable course of risk management which is functionally effective and which optimizes the use of available resources. The School seeks to comply with federal, state and local requirements pertaining to environmental protection, occupational health and safety, public safety, and building, fire and sanitation codes. The School will provide resources, training, facilities and services dedicated to this purpose. Environmental and occupational health and safety issues will be squarely confronted with the intention of administering such matters in a manner which reflects the highest ethical and professional standards.

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Mission:

The mission of the EHS office is to protect the health and safety of all campus personnel, protect the environment, ensure institutional compliance with applicable laws and regulations and to control risk and minimize institutional liability.

Priorities:

A general system for assigning planning and implementation priorities to program functions is as follows:

Priority 1 - Threats to persons.
Priority 2 - Threats to property.
Priority 3 - Threats to environment.
Priority 4 - Regulatory compliance.
Priority 5 - Avoidance of future crises.
Priority 6 - Maintenance of good public relations.

Hierarchy of Duty:

The Environmental Health and Safety office has a split function on the campus. The EHS office provides services in support of research and teaching, but also has a duty to enforce environmental health and safety standards in operations involving teaching and research. This split function can raise questions concerning organizational allegiance and legal and moral responsibility. To help clarify EHS office responsibility in the event of conflicts of interest, the following is a prioritized hierarchy of duty to serve:

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Priority 1 - The welfare of individual students and employees.
Priority 2 - The institution.
Priority 3 - Organizational subunits of the School.
Priority 4 - Federal and state agencies.

Program Elements:

I. Environmental Health:

- Hazardous waste collection and disposal.
- Chemical spill response.
- Management of CSMRI issues.
- Environmental monitoring -- air/water quality.
- PCB management.
- Community Right-to-Know.

II. Occupational Health/Industrial Hygiene:

- Asbestos abatement.
- Identify and measure employee exposures to hazardous materials.
- Employee use of personal protective equipment/respirators.
- Evaluate local exhaust systems (ventilation).
- Medical surveillance.
- Employee Right-to-Know training.

III. Occupational Safety:

- Worksite inspection.
- Policies concerning employee use of personal protective equipment.
- Provide fall protection equipment training and policies.
- Provide trench shoring training and policies.
- Establish tagout program.
- Ensure machine guards in place.
- Provide confined space entry training and policies.
- Vehicles/heavy equipment.

IV. Fire Safety

- Conduct fire inspections.
- Evaluate/improve chemical storage facilities.

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- Establish program for inspection, testing, and maintenance of fire safety systems.
- Assist fire department in pre-fire planning.
- Develop long-term fire safety improvement plans.
- Plan review/code compliance.

V. Student Health and Safety:

- Establish residence building life safety standards.
- Sports safety.
- Laboratory safety.
- Fire drills.
- Student life staff training.

VI. Miscellaneous:

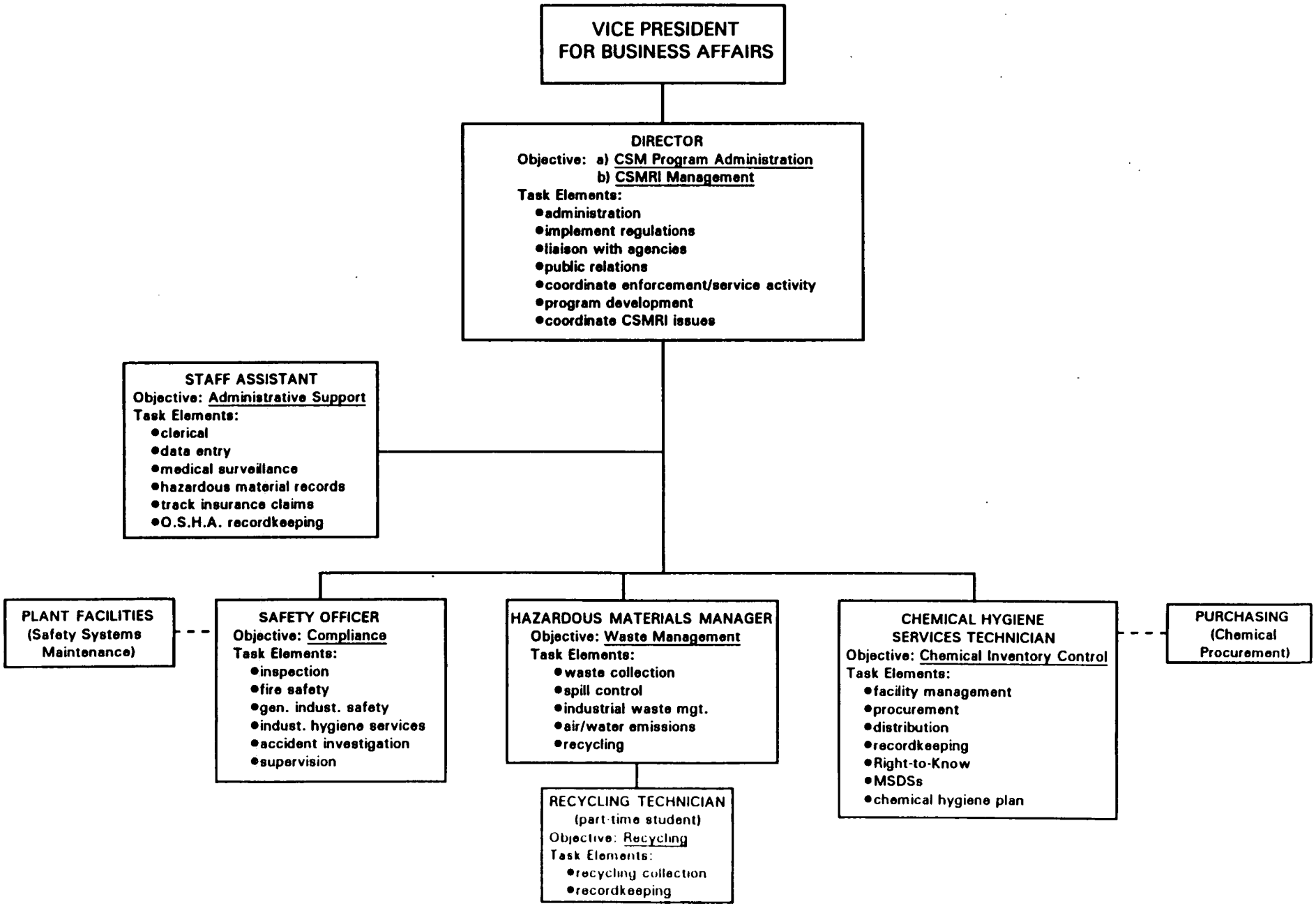
- Accident investigation.
- Liaison with local emergency services.
- Sanitation.
- Liability issues.
- Walking/working surfaces.
- Various training and awareness programs.

Organization:

Figure 1 depicts the organization of the EHS office and identifies objectives and task elements for each position in the office.

FIGURE 1

ENVIRONMENTAL HEALTH AND SAFETY STAFF ORGANIZATION



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Biohazards are defined to be potentially infectious microbiological agents including parasites, fungus, bacteria, rickettsia, virus or recombinant DNA materials which pose a threat of causing infection or disease in humans, animals or plants. (Human blood borne pathogens including HIV and Hepatitis-B are addressed separately in Section F-12 of this Policy Manual). Procedures for handling biohazardous infectious agents are promulgated by the Centers for Disease Control (CDC) and by the National Institute of Health (NIH). The Colorado School of Mines will conform with CDC/NIH guidance published in a book entitled Biosafety in Microbiological and Biomedical Laboratories, U.S. Department of Health and Human Services, 3rd Edition, May 1993. Additional guidance concerning protective measures for recombinant DNA research is found in a publication entitled Laboratory Safety Monograph, A Supplement to the NIH Guidelines for Recombinant DNA Research, U.S. Department of Health, Education and Welfare (now H.H.S.), January 1979.

Generally, infectious microbiological agents are divided into four risk categories. Class 1 agents present the least risk, and Class 4 agents present the greatest risk. Similarly, 4 levels of containment are prescribed for management of infectious agents. Biosafety Level 1 containment is the least restrictive mode, and depends on standard microbiological laboratory practices without the use of special containment barriers. Biosafety Level 2 requires an expanded system of containment which utilizes primary barriers (face shields, gowns, shields, etc.) to protect against splashes or direct contact with aerosols. Biosafety Level 3 requires handling of infectious agents in biological safety cabinets. Biosafety Level 4 requires complete isolation of infectious materials in the most protective type of biological safety cabinet. The room itself must also be physically isolated and must be equipped with specialized ventilation and waste management

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systems. The School is not equipped with biosafety Level 3 or 4 facilities. Therefore, possession of Class 3 or 4 infectious agents is prohibited.

Acquisition of all Class 1 or 2 infectious agents or acquisition of recombinant DNA materials must be pre-approved by the EHS office. The EHS office will work out specific methods for package receipt, delivery, laboratory signage, handling procedures and equipment on a case-by-case basis with the principal investigator. In circumstances where a biological cabinet will be needed, the principle investigator shall insure that the cabinet is installed, certified, maintained and inspected in accordance with guidance published in Standard Number 49, Class II Laminar Flow Biohazard Cabinetry, National Sanitation Foundation, May 1983.

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General:

The School provides resources, training, facilities, and services which support a satisfactory standard of health, safety and environmental protection for the campus. The School seeks to comply with various regulations and authoritative standards pertaining to environmental protection, occupational health and safety, public safety, and building, fire, and sanitation codes. Health and safety issues are squarely confronted with the intention of administering such matters in a manner which reflects the highest ethical and professional standards.

Responsibilities:

The effectiveness of the campus health and safety program is largely dependent upon the degree of personal responsibility which is assumed by individual supervisors at all levels in the university organization.

a) The School Administration is responsible to provide resources, plans, and guidance sufficient to support an effective Environmental Health and Safety Program.

b) Deans, Directors, Department Chairpersons, and Supervisors are directly responsible for safety, health, and environmental protection activities in their respective organizations. As institutional leaders, this responsibility cannot be transferred or delegated. Measures to prevent accidents, occupational illness and environmental degradation must be integrated into all organizational activities. Supervisors are responsible to implement organizational policies,

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establish procedures and provide direct guidance to subordinates concerning on-the-job safety and health.

c) Faculty members have a special responsibility for providing health and safety guidance to students. It will often be necessary for faculty members to incorporate health and safety training into certain courses of instruction which involve potential exposure to risk. In some cases the knowledge and judgment of faculty members may be the only means to recognize and resolve hazards associated with specialized forms of research. In these circumstances the protection of property, persons, and the environment may be solely contingent upon the care of the individual faculty members. The institution depends heavily upon the judgement of the individual faculty member in such cases.

d) The Director of Environmental Health and Safety maintains current knowledge of health, safety, and environmental protection regulations and standards, and develops and implements programs which ensure institutional compliance with those standards. The Director monitors campus facilities, operations and activities, and identifies risks to health, safety, the environment and property. The Director initiates plans, proposals, and guidance for resolving risks. The Director provides consulting and technical services to the university community in matters related to environmental protection and occupational health and safety. The Director provides recommendations to the Administration concerning allocation of resources for health and safety improvements, and recommends policy and program adjustments.

e) The Safety Committee formulates institutional health and safety policies on topics which, due to their nature, require collaboration and consensus among all segments of the university community.

f) All students and employees are responsible to adhere to safety and health policies which are set forth by instructors or supervisors. Compliance with such policies is mandatory. All university personnel are expected to report hazards and accidents, and to exercise reasonable judgement and care during conduct of business on the campus.

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Enforcement:

The EHS office is responsible to enforce environmental health and safety regulations on the campus. Enforcement action will be taken as a last resort following efforts to elicit cooperative responses from cognizant supervisors/ administrators. The level of assertiveness of enforcement action and the timeliness of the required response will be a function of the level of urgency. A schedule of enforcement activity keyed to level of urgency is as follows:

SCHEDULE OF ENFORCEMENT ACTIVITY

Phase I - Low Urgency:

- Department Head requested to respond with written plan and timetable within 3 weeks.

Phase II - Urgent:

- Department Head requested to meet EHS personnel at scene of problem within 7 days. The intention is to reach agreement as soon as possible concerning how and when a discrepancy will be resolved.

- EHS gives prior notice to central administration.

- Phase II may be prompted by inadequate departmental response to Phase I.

Phase III - Very Urgent:

- Department Head requested to meet EHS personnel at scene of problem within 24 hours. The intention is for EHS and departmental personnel to resolve the problem immediately.

- EHS gives prior notice to central administration.

- Phase III may be prompted by inadequate departmental response to Phase I or II.

- May be disruptive/inconvenient for departmental personnel.

Phase IV - Extremely Urgent:

- EHS acts unilaterally to resolve a problem immediately.
- Department Head and central administration notified of action after the fact.
- May be very disruptive/highly inconvenient for departmental personnel.
- Phase IV response may be prompted by lack of departmental response to Phase II or III.

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
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1. Individuals who exercise the right to possess, use, or store regulated materials on the campus are assigned the responsibility for ensuring that those materials are properly managed. "Proper management" means to act in accordance with modern health, safety, and environmental practices; authoritative standards; and applicable local, state and federal regulations. The EHS Office will provide information upon request concerning proper management practices for specific materials.

   Compliance with institutional policy concerning management of hazardous materials is mandatory and is a condition of employment and/or enrollment. The right to possess regulated materials is contingent upon the possessor having knowledge of the hazardous characteristics of such materials and knowledge of proper handling, storage, and disposal practices. Regulated materials include chemical, biological and radiological agents.

2. Specific individuals must claim responsibility for the management of each regulated material on the campus. The responsible individual must be able to explain a specific purpose and plan for use of each regulated item in storage. In general, purchase of chemicals should be restricted to quantities which are sufficient for not more than one year. Any container or quantity of regulated material which is not under the care of a responsible and available individual is deemed to be abandoned. Regulated materials which are abandoned will be declared to be waste by the EHS Director. Costs for handling and disposal of abandoned waste are charged to the department which controls the space where the abandoned waste is located.

   Costs for cleanup of environmental discharges of regulated hazardous substances will be borne by the academic department which is

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responsible for the area where the discharge occurred, or which is responsible for the operation which caused the discharge.

3. Abandonment, or unsafe storage, handling or disposal practices for regulated materials which cause a threat to public safety, or which cause the university to violate state or federal law, will prompt investigation by police officers. Purposes of the police investigation will be to identify individuals who caused the violation, and to determine if there is evidence of negligence. State and federal law prescribe civil and criminal penalties for negligent handling of hazardous materials.

4. The intent of this policy is to assign individuals with the responsibility for the management of regulated materials and to assign departments with the responsibility for the management of individuals. All faculty, staff, students, and departments on the campus are directly affected by this policy. It is the duty of the Department Head to ensure that departmental personnel are made aware of provisions of this policy. This policy applies to teaching and research materials, industrial chemicals, and regulated materials in display cases and collections.

5. Each individual who procures, uses, stores, handles, or disposes of regulated materials is responsible for the management of that material. This responsibility cannot be transferred to delegated to clerical workers, technicians, or part-time helpers. Principal investigators and laboratory supervisors are responsible for management of hazardous materials or processes in research labs. Faculty instructors are responsible for the management of hazardous materials and processes in teaching labs.

6. Individual chemical users, Principal Investigators, or laboratory supervisors compile an annual inventory of chemicals in the laboratory and in common storage areas. The inventory is submitted to the Department Head who produces an annual departmental inventory. This is a principal means of identifying chemicals which are in "dead storage" and have no intended purpose. It is of particular use in identifying highly toxic or reactive chemicals, unused perchloric acid, picric acid, and chemicals which have a limited shelf life (peroxide formers). These chemicals must be managed properly in the laboratory and must be subject to timely disposal.

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7. Individuals who generate regulated waste must identify waste material and initiate collection in a timely manner which minimizes both the quantity of stored waste and time that the waste is in storage. The individual waste generator accomplishes these goals by attaching tags to waste containers and by submitting waste disposal forms to the EHS Director.

8. When an individual who manages the use or storage of regulated materials plans to retire, move, graduate, etc., he/she must ensure that any leftover materials, chemicals or chemical waste are subject to collection, and proper disposal or redistribution before he/she leaves. This includes any waste or chemicals which may be kept in common storage areas.

9. All regulated materials including chemicals, biological agents and radioactive materials must be procured via the Central Chemical Storage and Distribution Facility which is operated in Coolbaugh Hall by the EHS office.

10. Regulated materials may only be procured by persons who have current training in hazardous waste management practices.

11. The following chemicals may not be procured, used, or stored on the campus unless authorization is granted by EHS personnel:

    A. any explosive
    B. any material that deteriorates over time to become explosive
    C. any material that is a regulated chemical waste and is also radioactive
    D. natural radioactive minerals
    E. sodium or potassium cyanide
    F. water-reactive or air-reactive materials (pyrophoric materials, alkali metals, white phosphorus, etc.)
    G. picric acid
    H. perchloric acid
    I. azides
    J. fulminates
    K. chromic acid
    L. organic peroxides (benzoyl peroxide, MEK peroxide)
    M. peroxide forming organics including:

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i) isopropyl ether
ii) divinyl acetylene
iii) vinylidene chloride
iv) sodium amide

N. mercury (excluding sealed fused glass equipment)
O. hydrazine compounds
P. pentachlorophenol
Q. lecture bottles of specialty gases which cannot be returned to vendor

In addition, the chemicals listed in the attachment are subject to even more stringent control by RCRA and are categorized in the regulation as "acutely hazardous waste." Procurement, use, or storage of any of the materials on the Figure 2 should also be authorized by EHS personnel.

Hazardous waste No.	Chemical abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P004	309-00-2	Aldrin
P005	108-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate (1-), bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H_3AsO_4
P012	1327-53-3	Arsenic oxide As_2O_3
P011	1303-28-2	Arsenic oxide As_2O_5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P067	75-55-8	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-
P046	122-09-8	Benzeneethanamine, alpha, alpha-dimethyl-
P014	108-98-5	Benzenothiol
P001	[1]81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts, when present at concentrations greater than 0.3%
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P045	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[methylamino)-carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide $Ca(CN)_2$
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P023	107-20-0	Chloracetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl)thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide
P029	544-92-3	Copper cyanide Cu(CN)
P030	.....	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P033	506-77-4	Cyanogen chloride (CN)Cl
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-

Hazardous waste No.	Chemical abstracts No.	Substance
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P051	[1]72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-, and metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P047	[1]534-52-1	4,6-Dinitro-o-cresol and salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-04-4	Disulfoton
P049	541-53-7	Dithiobiuret
P050	115-29-7	Endosulfan
P088	145-73-3	Endothall
P051	72-20-8	Endrin
P051	72-20-8	Endrin, & metabolites
P042	51-43-4	Epinephrine
P031	460-19-5	Ethanedinitrile
P066	16752-77-5	Ethanimidothioic acid, N-[[methylamino)carbonyl]oxy]-, methyl ester
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoracetic acid, sodium salt
P065	628-86-4	Fulminic acid, mercury(2+)salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyl tetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P060	465-73-6	Isodrin
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P082	62-75-9	Methamine, N-methyl-N-nitroso-
P064	624-83-9	Methane, isocyanato-
P016	542-88-1	Methane, oxybis[chloro-
P112	509-14-8	Methane, tetranitro- (R)
P118	75-70-7	Methanethiol, trichloro-
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P066	16752-77-5	Methomyl
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P072	86-88-4	alpha-Naphthylthiourea
P073	13463-39-3	Nickel carbonyl
P073	13463-39-3	Nickel carbonyl, $Ni(CO)_4$, (T-4)-
P074	557-19-7	Nickel cyanide
P074	557-19-7	Nickel cyanide $Ni(CN)_2$

Hazardous waste No.	Chemical abstracts No.	Substance
P075	[1] 54-11-5	Nicotine and salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide NO
P078	10102-44-0	Nitrogen oxide NO_2
P081	55-63-0	Nitroglycerine (R)
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P085	152-16-9	Octamethylpyrophosphoramide
P087	20816-12-0	Osmium oxide O_sO_4,(T-4)-
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51-28-5	Phenol, 2-4-dinitro-
P047	[1] 534-52-1	Phenol, 2-methyl-4,6-dinitro- and salts
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene
P096	7803-51-2	Phosphine
P041	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P097	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl] phenyl] O,O-dimethyl ester
P071	298-00-0	Phosphorothioic acid O,O-dimethyl O-(4-nitrophenyl) ester
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide
P098	151-50-8	Potassium cyanide K(CN)
P099	506-61-6	Potassium silver cyanide
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[methylamino) carbon-yl]oxime
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	107-19-7	2-Propyn-1-ol
P008	504-24-5	Pyridinamine
P075	[1] 54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-(S)-, and salts
P114	12039-52-0	Selenious acid, dithallium(1+) salt
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P104	506-64-9	Silver cyanide Ag(CN)
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P106	143-33-9	Sodium cyanide Na(CN)
P108	[1] 57-24-9	Strychnidin-10-one, and salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	[1] 57-24-9	Strychnine and salts
P115	7446-18-6	Sulfuric acid, dithallium(1+) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethyl pyrophosphate
P112	509-14-8	Tetranitromethane (R)
P062	757-58-4	Tetraphosphoric acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium oxide Tl_2O_3
P114	12039-52-0	Thallium(I) selenite
P115	7446-18-6	Thallium(I) sulfate
P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium oxide V_2O_5
P120	1314-62-1	Vanadium pentoxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P001	81-81-2	Warfarin, and salts, when present at concentrations greater than 0.3%
P121	557-21-1	Zinc cyanide
P121	557-21-1	Zinc cyanide $Zn(CN)_2$
P122	1314-84-7	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)

[1] CAS Number given for parent compound only.

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Replaces: N/A
Approved by: George Ansell, President
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It is in the interest of the Colorado School of Mines (CSM) to promote the conservation of natural resources and reduce the quantity of waste which must be disposed of in landfills. To provide a demonstrated leadership example to individuals, business, and other government agencies, CSM established a campus-wide recycling program in 1991. The goals of the program are:

1. To provide a leadership role in safeguarding our environment, preserving, protecting and recycling our natural resources.

2. To accomplish economic and environmental goals which will strengthen the School's efficiency and lessen our society's energy consumption and promote a healthy economy.

To accomplish these goals CSM established the following:

1. The Environmental Health and Safety Office (EHS), through the "Recycle CSM" program, is the lead unit for the promotion and development of recycling programs at CSM. All departments of CSM shall cooperate fully with the efforts of EHS to establish an infrastructure for recycling.

2. All monies generated by the "Recycle CSM" program shall be returned to the program administered by EHS for the promotion, development and advancement of the program.

3. Among the activities to be under taken by "Recycle CSM," based on availability of funds, are: education and promotion, expansion of the program, development of new programs, development of recycled materials purchasing guidelines, and an information clearinghouse for CSM faculty, staff, and students.

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4. All departments are encouraged to educate their employees in the benefits and advantages, both economic and environmental, of recycling programs, and to identify and develop rules, policies or practices which encourage waste reduction or recycling.

5. EHS shall yearly review the progress of the "Recycle CSM" program and report its findings in the EHS report to the Board of Trustees.

For details as to how the "Recycle CSM" program is structured, what can be recycled and how, see the Recycle CSM Program manual. A copy of this manual is maintained in the EHS Office.

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Replaces: N/A
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All CSM employees, including part time student workers, must receive formal documented training in forklift truck operation before they may operate forklift trucks. Upon completion of this training, supervisors shall designate authorized forklift truck operators in writing. These procedures are required by OSHA Regulations 29 CFR Part 1910.

The EHS office will assist supervisors in arranging training for prospective operators. Cost for the training is borne by the department which operates the forklift truck.

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Issued by: R.A. MacPherson, Director, EHS
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1. General -- The Director of the Student Health is responsible to manage public health and sanitation issues related to students. The EHS Director is responsible for management of public health and sanitation issues related to employees.

2. Blood Borne Pathogens --

   A. HIV -- The School considers HIV to be non-transmissible by means other than sexual contact; therefore, employees with HIV may continue to work in their customary location without special accommodation until such time as their illness may render them incapable of performing assigned duties. The Governor's Executive Order 104-89 depicted in Figure 3 is the precedent for this policy.

   B. Protection of Public Safety Officers -- The Public Safety Director will ensure that Public Safety Officers are trained and equipped to avoid contact with blood borne pathogens, including HIV and Hepatitis B. The EHS office will offer and arrange Hepatitis B vaccination to Public Safety Officers at the expense of the EHS office.

3. Food Sanitation --

   A. Student Center Food Service Operations -- The Director of Student Life is responsible to arrange for food sanitation inspections and compliance in Student Center food service operations.

   B. Sorority/Fraternity Food Service Operations -- House Corporation Officers are responsible to arrange for food sanitation inspections and compliance in sorority/fraternity food service operations.

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4. Water Quality, Plumbing and Swimming Pool Sanitation -- The Director of Plant Facilities is responsible to arrange for water quality inspections and compliance, cross-connection control measures and swimming pool sanitation.

5. Medical Waste -- The Student Health Center will collect medical waste, including body fluids, tissue samples, cultures, contaminated wipes, swabs, bandages, etc. and used syringes, scalpels, needles, etc.... These materials shall be turned over to the EHS office. The EHS office will accomplish proper disposal of such materials in a commercial medical waste incinerator.

Figure 3

Non-discrimination against persons infected with the AIDS virus

Executive order 104-89 states:

1. Appointing authorities in state government shall not discriminate in employment practices against any person infected with the AIDS virus or at risk for or perceived to be at risk for the infection.

2. All executive directors of the principal departments of state government shall make it known that no human rights violations against people infected with the AIDS virus shall be tolerated in this state and that any violation will be immediately reported to the Colorado Civil Rights Commission for appropriate action.

3. Persons diagnosed with HIV infection shall not be subject to any form of harassment within the work place, and any persons with HIV infection and otherwise qualified for employment services or benefits shall not be discriminated against in any fashion. Further, strictest principles of confidentiality will be maintained in management of personal medical information.

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Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Organization -- Members of the Environmental Health and Safety (EHS) office and volunteer members of Plant Facilities and the Public Safety Office comprise the Chemical Spill Response Team. The Team operates under the direction of the EHS office Hazardous Materials Manager.

2. Purpose -- The purpose of the Chemical Spill Response Team is to provide a service to campus laboratory personnel and to the local fire department. The Team is trained and equipped to deal with a very wide variety of relatively minor chemical emergencies which involve relatively small quantities of hazardous materials.

3. Equipment -- The Team is equipped with a wide variety of chemical neutralizers and absorbents and various detection and sensing instruments. A wide variety of personal protective equipment is also available. The highest degree of protection (Level A) can be achieved through the use of whole body encapsulation suits and self-contained breathing apparatus.

4. Communications -- Each member of the Team is available by phone or pager 24 hours a day, 7 days a week. Team members are also equipped with radios which facilitate coordination with Public Safety and with municipal emergency responders during an incident. Members of the EHS office will establish on-scene and administrative command posts in order to keep the University administration informed as to the status of each incident.

5. Training -- Each member of the Team receives 40 hours of initial training and 2 hours of on-going training each month.

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6. Medical Surveillance -- Each member of the Team receives an intensive physical examination at the time of commencement of duties, on an annual basis thereafter, and at the time of termination of duties. In addition, each member of the Team is "fit tested" for respirators on a semi-annual basis.

7. Command Authority -- The Fire Department retains command authority at the scene of a hazardous materials incident on the campus. The CSM Team assists and coordinates activities with the Fire Officer in charge.

8. Regulatory Precedent -- The operations of the Chemical Spill Response Team are conducted in accordance with the Superfund Amendments and Reauthorization Act of 1986, Section 126e, and OSHA Regulation 29 CFR Part 1910.120(i)ii.

9. Detailed Plans and Procedures -- A comprehensive document entitled "Colorado School of Mines Hazardous Material Response Plan" describes detailed response procedures. This document is available for review in the EHS office.

10. Notification of Laboratory Personnel -- Figure 4 is a sample notification sign which has been distributed for posting in all campus laboratories. The notification advises lab personnel of what to do in an emergency and how to contact the Chemical Spill Response Team.

HAZARDOUS MATERIALS EMERGENCY INFORMATION

(Post by Laboratory Telephones)

Chemical Spills: The Environmental Health and Safety (EHS) Office provides a chemical spill response service. EHS personnel are properly equipped to assist lab workers in cleaning up small-scale chemical spills. Call the EHS office any time for an evaluation, information or spill cleanup assistance. In the event of significant spills which pose an imminent threat of fire/ explosion or poisoning, or in those circumstances where an immediate evacuation seems advisable, lab personnel should: 1) sound the fire alarm to initiate an evacuation; 2) call the Fire Department; 3) call CSM Public Safety (Public Safety will notify the EHS Office).

ALL occupants must evacuate campus buildings whenever:

1. The fire alarm sounds.
2. An order to evacuate is given by the Fire Officer in charge, EHS Office personnel, Public Safety Officers, or the Department Head.

Exercise of Authority: If the Fire Department responds to an incident in a campus building, the Senior Fire Officer on the scene is in command. All School personnel shall take direction from the Senior Fire Officer. During such events, EHS personnel are the School's on-scene representatives and coordinate activities with fire authorities. If the Fire Department is not involved, EHS personnel are in charge and will coordinate with senior administrators in the building to resolve the problem.

CSM Public Safety Officers are invested with police powers and may exercise command authority during emergencies.

Chemical Exposure/Chronic Illness: Lab personnel should be familiar with the hazardous characteristics of chemicals in the lab. Call the EHS Office for information concerning flammability, toxicity, reactivity, etc., of chemicals and recommended safe handling procedures. If physical symptoms appear which may be related to chemical exposure, call the EHS Office for an evaluation.

Hazardous Waste: The School provides a centralized hazardous waste collection and disposal service. Call the EHS Office for information. All chemical waste generated in laboratories is presumed to be "Regulated Hazardous Waste" unless determined otherwise by EHS personnel or other knowledgeable person. DO NOT DUMP CHEMICALS DOWN THE DRAIN OR IN THE TRASH. Participation in the School's Hazardous Waste Program is mandatory for all campus personnel who generate chemical waste. Collection, transport or disposal of regulated waste by any other method is prohibited.

EMERGENCY PHONE NUMBERS

EHS Office	273-3316
CSM Public Safety Office	278-0757
	273-3333
Golden Fire Department	9-911
Golden Police Department	9-911
Ambulance	9-911
Rocky Mountain Poison Center	629-1123

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Regulatory Requirements -- Procedures for issuing public and internal notification of releases of hazardous materials are enumerated in the following federal and state regulations:

   EPA Regulations 40 CFR Part 302.6 (CERCLA Releases)
   EPA Regulations 40 CFR Part 355.4 (Emergency Planning and Notification)
   EPA Regulations 40 CFR Part 370 (Community Right-to-Know)
   DOT Regulations 49 CFR Part 172 (Transportation Incidents)
   EPA Regulations 40 CFR Part 262 (Hazardous Waste)
   Colorado Regulations 6 CCR 1007-3 Part 262.34 (Hazardous Waste)
   Colorado Radiation Control Regulations (Radioactive Materials)
   NRC Regulations 10 CFR Part 20 (Radioactive Materials)
   EPA Regulations 40 CFR Part 61 (Asbestos and Other Hazardous Air Pollutants)
   OSHA Regulations 29 CFR Part 1910 (Asbestos and Other Hazardous Materials in the Occupational Environment)
   EPA Regulations 40 CFR Part 761 (Polychlorinated Biphenyls)
   EPA Regulations 40 CFR Part 82 (Chlorofluorocarbons)
   Colorado State Regulation 15 (Chlorofluorocarbons)
   EPA Regulations 40 CFR Part 63 (Combustion Products Released to the Air)
   EPA Regulations 40 CFR Part 403 (Discharges to Sanitary Sewers)
   EPA Regulations 40 CFR Part 125 (Discharges to Stormwater)

2. Notification Procedures -- Campus personnel are directed to report all releases of hazardous materials to the EHS office. Campus personnel are notified of this requirement via correspondence, signs in campus laboratories, and during mandatory Employee Right-To-Know Training, Hazardous Waste Generator Training and Radiation Worker Safety

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Training. EHS office personnel maintain an awareness of release notification requirements. A detailed reference document entitled "Hazardous Material Discharge Notification Guidance" is maintained in the EHS office. The EHS Director will issue official release notifications following consultation with senior administrators.

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Regulatory Requirements -- The Toxic Substances Control Act, 40 CFR Part 761, governs management and control of polychlorinated biphenyls (PCBs).

2. PCB Transformers -- The Plant Facilities Electric Shop has replaced all School-owned PCB transformers on the campus. In addition, all large PCB capacitors and liquid-filled switches have been replaced. Due to the ubiquitous nature of PCB-containing materials, it is possible that some small, portable PCB transformers or capacitors may still be present on the campus. The campus Safety Officer has been tasked with the responsibility to check for remaining PCB equipment during annual safety inspections of buildings.

3. PCBs in Light Ballasts -- During 1992 and 1993, the EHS office and Plant Facilities undertook an ambitious program to replace PCB light ballasts in campus buildings. It is believed that almost all PCB light ballasts have been replaced. There is still a possibility that some PCB light ballasts may have been missed. In recognition of this possibility, the EHS office periodically issues the Notice in Figure 5 to Plant Facilities electricians and custodians. The Notice provides guidance concerning methods for responding to leaking light ballasts.

4. Waste Storage and Disposal -- The Hazardous Materials Manager has designated an area in the Hazardous Materials Management Facility for storage of PCBs awaiting disposal. Signage, record keeping, containment and disposal deadlines are maintained in compliance with requirements in the Toxic Substances Control Act.

2/28/95-Bobrept/Report16

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Figure 5

NOTICE TO PLANT FACILITIES PERSONNEL

(Custodians, Electricians)

Concerning P.C.B. Light Ballasts

Be advised that older fluorescent light fixtures may release Polychlorinated Biphenyls (PCBs) when the light ballast fails. PCBs may be a component of the hot, tarry liquid discharge which is associated with ballast failure. PCBs are substances which may be harmful to humans and the environment. EHS personnel, electricians, and custodians will need to work together in order to properly handle discharges from failing light ballasts. Adherence to the following procedures will ensure that such discharges are controlled:

1. No one should come in contact with discharges from light ballasts. Custodians should not clean up discharged material unless EHS personnel authorize the clean-up.

2. If a ballast fails, turn off the lights and remove any material from beneath the discharge. It is important to prevent discharges from contacting material which is valuable or difficult to clean (i.e. computers, books, papers, carpet, etc.). If possible place a trash can under the discharge. Ventilate the room (open windows), clear all persons from the area, close the door and call the EHS office. EHS personnel will coordinate clean-up and will direct reoccupancy of the space.

3. EHS personnel will need the assistance of an electrician in assessing the situation. Electricians should wear protective gloves when working in proximity to liquid discharges and should avoid skin contact.

4. When a ballast failure prompts the release of a discharge, EHS and Plant Facilities personnel should assume that the discharged material contains PCBs until proven otherwise. EHS personnel and electricians can easily confirm that no PCBs have been released by examining the ballast. Modern ballasts which do not contain PCBs are labeled as such. It is thought that many discharge incidents will involve these non-PCB ballasts. When it is confirmed that no PCBs have been released, custodians may be requested to clean up the spilled material. If older, unlabeled ballasts are involved, all discharges should be presumed to contain PCBs. EHS personnel will clean up the spilled material and will direct the proper disposal of the ballast and contaminated clean-up materials.

5. Old light ballasts which are not labeled as PCB free, should be presumed to contain PCBs. These ballasts should not be casually thrown away even if they are not leaking. Please turn these old ballasts over to EHS who will ensure proper disposal.

2/28/95-Bobrept/Rept16A

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Discharge Permit -- The School has been issued an Industrial Waste Water Discharge Permit. A copy of the permit is maintained in the EHS office. The Permit specifies that discharges to the sanitary sewer may not contain more than the following contaminant concentrations:

Cadmium	.0059	mg/L
Chromium	1.98	mg/L
Copper	1.01	mg/L
Iron	12.97	mg/L
Lead	.52	mg/L
Mercury	.0003	mg/L
Nickel	.96	mg/L
Silver	.0032	mg/L
Zinc	5.70	mg/L
pH	$5 < pH < 10$	

In addition, the discharge of malodorous or flammable waste is prohibited. Similarly, the discharge of any material that would interfere with the operation of the waste treatment plant is prohibited.

2. Monitoring -- In accordance with the Waste Water Discharge Permit, the EHS office accomplishes monitoring of sewer effluent at 8 outfalls on a semi-annual basis. Noncompliant results are immediately reported to the City and resamples are obtained at the noncompliant outfall.

3. Mercury and Silver -- Noncompliant results for mercury and silver have been detected on numerous occasions at Hill, Coolbaugh and Alderson Halls. These incidents of noncompliance have elicited several formal Notices of Violation from the City. In response to the Notices of Violation, the School has implemented a program for capturing all mercury and silver waste (photoprocessing waste) before these materials

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enter sewer drains. In addition, a rigorous program for maintaining an accurate inventory of all silver and mercury-containing compounds and equipment has been implemented. The EHS office maintains a master inventory of all mercury and silver on the campus. Individual faculty and staff members are assigned the responsibility for tracking the disposition of each mercury and silver item on the inventory. The master inventory is corrected every six months.

4. Personnel Training -- Department heads and faculty members in affected departments have been individually notified of the necessity for preventing drain discharge of regulated materials. In addition, this topic is emphasized during mandatory Hazardous Waste Generator Training, which is provided by EHS personnel. Every faculty, staff, and graduate student is required to attend this training before they are authorized to procure, store, or use regulated materials on the campus.

3/1/95-Bobrept/Report17

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Regulatory Requirements -- Community Right-To-Know requirements are established in EPA Regulations, 40 CFR Part 370.

Program Administration -- The EHS office is responsible for annual reporting and emergency release notification to the Local Emergency Planning Committee and the State Emergency Planning Commission. The EHS office also provides detailed information concerning the quantity and location of hazardous materials to the local fire department. Figure 6 is a sample Hazardous Material Data Sheet. One of these sheets is maintained for each room in every campus building. The sheets are updated each year with corrected copies inserted in the master inventories which are maintained in the EHS office and at the Fire Department.

Annual Reporting -- The EHS office initiates required annual reports to the Local Emergency Planning Committee and the State Emergency Planning Commission. Figure 7 is a sample Annual Report.

Material Safety Data Sheets -- The EHS office utilizes three methods to obtain Material Safety Data Sheets or equivalent information:

A. A set of 23 binders contains an alphabetical listing of MSDSs for each chemical which is purchased by CSM personnel. These binders are maintained in the EHS office.

B. The EHS office subscribes to a CD-ROM update service which provides easy computer access to a large integrated database concerning the hazardous properties of a large number of chemicals.

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C. The Central Chemical Storage and Distribution Facility has set up an on-line system for accessing a large MSDS database at the University of Utah. Internet is used to link any computer on the campus system to the MSDS database.

Environmental Inspection Audit
Colorado School of Mines
Environmental Health and Safety Department

ID: 1094 (Record created 03-25-93, last mod 03-25-93)

Inspection Date: 02-26-93 Inspected By: MacPherson
Building/Bldg. Description: PF - PLANT FACILITIES OFFICE
Room/Area/Space; Identification and Description:
Instrument Shop -- metal plating

Department in charge of space: PF - Plant Facility
Person in charge of space: Sudermann

Equipment:
Ventilation (describe):
3 fume hoods, 1 paint booth, 1 home built dust removal system in metal polishing area

Moveable storage cabinets:
2

Showers/eyewashes:
1

Fire extinguishers:
5

Radiation producing equipment:
Not Applicable

Hazardous Materials:
Acids (Kg):
20 Kg

Bases (Kg):
Not Applicable

Flammable/combustible liquids (Kg):
): 100 Kg

Oxidizers (Kg):
Not Applicable

Other toxics (Kg):
20 Kg (cyanide)

Other hazards:
Radiactive sources (describe):
Not Applicable

Explosives (identify):
Not Applicable

Air/water reactives (identify):
Not Applicable

Cyrogenic liquid:
Not Applicable

Compressed Gases (No. and size of cylinders):
Flammable:
1 acetylene

Inert:
Not Applicable

Other toxics:
1 oxygen

Potential Sources of Metals Discharges to Sewer:
Manometers:
Not Applicable

Thermometers:
Not Applicable

Photoprocessing:
Not Applicable

Other:
Not Applicable

Environmental Health and Safety
Colorado School of Mines
Golden, CO 80401-1887
303/273-3316

COLORADO SCHOOL OF MINES
GOLDEN, COLORADO 80401-1887

March 22, 1994

Dick Cook, Director
Department of Emergency Preparedness, and
Chairman, JEFFCO Emergency Planning Committee
100 Jefferson County Parkway, Suite 1530
Golden, CO 80419

Dear Mr. Cook:

The attached annual inventory report form is submitted in accordance with 40 CFR 370.25 "Hazardous Chemical Reporting: Community Right-to-Know."

Sincerely,

R. A. MacPherson
Director, Environmental
Health and Safety

RAM/gk

Attachment

cc: Judith Waddill, Emergency Response Commission
Chief Burrell, Golden Fire Department

3/23/94-rit2no2-C-RAM

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Page ____ of ____ pages
Form Approved OMB No. 2050-0072

Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY
Specific Information by Chemical

Facility Identification
Name: Colorado School of Mines
Street Address: Envir. Hlth. & Safety, 1015 - 14th
City: Golden State: CO Zip: 80401
SIC Code: 8221 Dun & Bradstreet Number: 01-062-8170

FOR OFFICIAL USE ONLY: ID #: ____ Date Received: ____

Owner/Operator Name
Name: Same Phone: (303) 273-3316
Mail Address: ____

Emergency Contact
Name: R.A. MacPherson Title: Director, EHS
Phone: (303) 273-3316 24 Hr. Phone: (303) 278-0757
Name: Wendell Rahorst Title: EHS Specialist
Phone: (303) 273-3316 24 Hr. Phone: (303) 278-0757

Important: Read all instructions before completing form

Reporting Period: From January 1 to December 31, 1991

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory: Max. Daily Amount (code)	Inventory: Avg. Daily Amount (code)	Inventory: No. of Days On-site (days)	Storage Codes and Locations (Non-Confidential): Storage Code	Storage Locations
CAS ____ Trade Secret ☐ Chem. Name: Unleaded Gasoline Check all that apply: ☐ Pure ☒ Mix ☐ Solid ☒ Liquid ☐ Gas	☒ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☒ Delayed (chronic)	03	02	365	A14	Plant Facilities Equipment Yard
CAS 7782-50-5 Trade Secret ☐ Chem. Name: Chlorine Check all that apply: ☒ Pure ☐ Mix ☐ Solid ☐ Liquid ☒ Gas	☐ Fire ☒ Sudden Release of Pressure ☒ Reactivity ☒ Immediate (acute) ☐ Delayed (chronic)	01	01	365	L24 L24	Volk Gymnasium Swimming Pool Coolbaugh Hall (Chemistry)
CAS ____ Trade Secret ☐ Chem. Name: ____ Check all that apply: ☐ Pure ☐ Mix ☐ Solid ☐ Liquid ☐ Gas	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☐ Immediate (acute) ☐ Delayed (chronic)					

Certification *(Read and sign after completing all sections)*
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

R. A. MACPHERSON DIRECTOR EHS — Signature: ____ Date Signed: 3/22/94
Name and Official Title of Owner/Operator or Owner/Operator's Authorized Representative

Optional Attachments *(Check one)*
☐ I have attached a site plan
☐ I have attached a list of site coordinate abbreviations

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Permits -- The School has five Stormwater Discharge Permits. Two of the permits are for CSMRI sites. The other three School permits cover the following School-owned properties:

   A. Claypits
   B. Joe Reynolds Claim and adjacent claims in the Silver Creek Drainage near Georgetown
   C. Experimental Mine in Idaho Springs

2. Permit Requirements -- Permits require that the School implement "best management practices" to prevent the discharge of contaminants in stormwater. At mine sites, permits require that stormwater be routed around waste rock piles. A program of periodic reports, water sampling, and site inspection is also required. Stormwater Discharge Permits are maintained in the EHS office.

3. Responsibility -- The EHS office administers the Stormwater Management Program with the assistance of Plant Facilities and the Manager of the Experimental Mine.

3/1/95-Bobrept/Report19

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

1. Governor's Executive Order -- Safety committees are established in accordance with the Governor's Executive Order DO138 89, July 28, 1989, concerning safety in the work place. (See Figure 8)

2. Safety Committee --

   A. Function -- To make recommendations to the Vice President for Business Affairs and the Vice President for Academic Affairs on matters relating to the safety of Colorado School of Mines personnel and facilities. Problems relating to radioactive materials will be referred to a special Radiation Protection Subcommittee.

   B. Method of Operation -- Facilities and operational procedures will be inspected on a periodic basis to ensure that reasonable safety practices are being observed and that there is an understanding and adherence to safety regulations. The Radiation Protection Subcommittee will make recommendations regarding the handling of radioactive materials in compliance with the license issued to the Colorado School of Mines by the Radiation Control Division of the Colorado Department of Public Health & Environment.

   C. Membership -- Director of Environmental Health and Safety, Chair; President of CSM as Chief member (per Executive Order DO122 89); Director of Plant Facilities or a designated representative; Dean of Graduate Studies and Research; Director of Human Resources/Affirmative Action; four members of the academic faculty approved by the Faculty Senate and appointed by the President; two members of the classified staff selected by the Classified Action Council, and one member of the Radiation Protection Subcommittee.

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Faculty and classified staff appointments will be for two-year staggered terms.

3. The members of the Radiation Protection Subcommittee will be the Radiation Safety Officer, the Vice President for Academic Affairs, and a faculty radiation safety representative. The Director of Environmental Health and Safety is designated as the Radiation Safety Officer. Duties of the Radiation Safety Officer are specified in the School's Radioactive Materials License and in State Radiation Control Regulations.

Executive Order: Safety in the Workplace

WHEREAS, injuries and illnesses in state workplaces impose a substantial burden upon the public employee in terms of personal tragedy and increased medical costs, and to the public employer in terms of lost efficiency and production, economic costs of retraining and replacement of injured and ill employees, lost production, workers' compensation payments, and health insurance costs; and

WHEREAS, the public employees of the State of Colorado deserve a workplace free from recognized hazards which cause death or harm; and

WHEREAS, it is appropriate for the State of Colorado to provide every state employee safe working conditions to the greatest extent possible;

WHEREAS, employees must be encouraged to report safety hazards; and

WHEREAS, the state should undertake to promptly investigate and correct safety deficiencies; and

WHEREAS, on May 30, 1989, I issued Executive Order DO122-89, giving a directive to all executive branch departments concerning the implementation of the revised Workers' Compensation Insurance Program to be administered by the Division of Risk Management, the provisions of which are reaffirmed and incorporated into this Executive Order by this reference;

NOW THEREFORE, I, Roy Romer, Governor of the State of Colorado, under the authority vested in me under the constitution and laws of the State of Colorado, ORDER:

1. The State of Colorado will attempt to provide a safe and healthful workplace to its employees, free from recognized hazards that are causing or are likely to cause death or serious physical harm to its employees.
2. The Governor's cabinet level safety committee ("Cabinet Safety Committee") having been established in Executive Order DO122-89 shall include the executive directors of all departments and shall meet periodically to review and evaluate the progress made in the implementation of this Executive Order and Executive Order DO122-89.
3. As directed in Executive Order DO122-89, each executive director and/or chief executive officer of a higher education institution shall establish a safety committee, ("Safety Committee") for the agency. The purpose of the Safety Committee will be to establish agency safety policies and procedures; to review the efficiency of such policies and procedures during the course of the year; and to evaluate and coordinate with the state Risk Manager's Office recommended changes and actions necessary to have the safest possible work environment. Each of these safety committees should have the executive director or college/university president as its chief member and the participation of employees and/or employee representatives. The purpose of establishing such committees is to ensure that issues affecting employee safety will be dealt with at the highest organizational levels.
4. The Division of Risk Management and the Safety Committee established by each executive director or president of each institution shall establish reasonable occupational safety and health standards that protect the health and safety of state employees. The Division of Risk Management and the Safety Committee shall request assistance including information and materials from the Occupational Safety and Health Administration on employee safety in the workplace. The Division of Risk Management and the Safety Committee shall determine what parts, if any, of the relevant Occupational Safety and Health Standards might be used as guidelines in establishing the occupational safety and health rules for the agency. Each agency shall report its progress in implementing the provisions of this paragraph and the remainder of the Executive Order to the Governor no later than January 31, 1990.
5. The Office of Risk Management working with the executive directors of the respective agencies is directed to establish procedures to ensure that all health and safety concerns identified by employees are brought to the immediate attention of the department head or president of an

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institution, are promptly and thoroughly investigated, and unsafe conditions are corrected as soon as possible.

6. Employees shall be protected against retaliation for filing complaints and testifying with respect to health and safety issues. Classified employees are protected under State Personnel Board Rule 1-4-3(e). All employees are protected under the Whistleblower Act, C.R.S. 24-50.5-101 et. seq. Any complaint regarding such retaliation shall be investigated by the Department of Personnel.

7. The Department of Administration's Division of Risk Management will be in charge of the overall coordination of this Executive Order. The Division shall make quarterly reports to the Office of State Planning and Budgeting (OSPB) concerning the Division's discharge of its policy and fiscal responsibilities under this Executive Order and Executive Order DO122-89.

8. Copies of this Executive Order shall be distributed to all state departments and agencies and shall be displayed in prominent locations in their offices and facilities, particularly those locations in which employee notices are generally posted.

Executive Order DO138-89 July 28, 1989

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Participation -- The EHS office pays for and administers a Medical Surveillance Program for campus personnel who participate in the following activities:

1. EHS Hazardous Waste Workers
2. Chemical Spill Response Team
3. Asbestos Abatement Workers

Medical exam procedures and record keeping requirements for personnel in these categories are established in OSHA Regulation 29 CFR Part 1910.

Laboratory Personnel -- Lab personnel who work with highly toxic materials may be included in a medical surveillance program at the discretion of the EHS Director and the Principal Investigator. In such cases, the EHS office will prescribe medical surveillance procedures which are consistent with OSHA Regulation 29 CFR Part 1910, ACGIH Biological Exposure Indices, and with the advice of a consulting occupational health physician. The EHS office pays for medical surveillance services.

3/1/95-Bobrept/Report21

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Responsibilities

A. The Principal Investigator/Laboratory Supervisor is responsible to train lab personnel and to develop and implement management procedures to ensure safe handling, storage and disposal of hazardous materials and to ensure the safe use of lab apparatus.

B. The EHS Director provides health and safety consulting and services in the areas of industrial safety, hazardous materials handling, storage and disposal, industrial hygiene, health physics, chemical spill response, medical surveillance and personnel training. The EHS Director also provides consulting services and evaluation of lab safety features such as fume hoods, hood filtration, ventilation, eyewash and showers, fire suppression systems, first aid kits and chemical storage arrangements and facilities.

C. The Director of Plant Facilities provides laboratory engineering and design services and maintains the condition of installed safety equipment such as fume hoods, eye washes, showers and installed fire/explosion suppression systems.

Chemical Hygiene Program

A. The Principal Investigator/Laboratory Supervisor is responsible to implement a Chemical Hygiene Program as described in F-39 of this Policies and Procedures Manual.

B. The Principal Investigator/Laboratory Supervisor shall ensure that all lab personnel are aware of the hazardous properties of all chemicals, biological or radiological agents in the laboratory. The Principal Investigator/Lab Supervisor shall ensure that a complete

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and accurate inventory of all chemicals in the laboratory is maintained. A Material Safety Data Sheet for each chemical shall be posted on a clipboard mounted in the hallway adjacent to the entry to each laboratory.

Ventilation

A. Fume Hoods -- Fume hoods must be used to contain airborne hazardous contaminants which are generated by laboratory operations. Fume hood design and capacity shall conform with guidelines in OSHA Regulations 29 CFR Part 1910, NFPA Pamphlet 45 and the current edition of the ACGIH Publication entitled "Industrial Ventilation, A Manual of Recommended Practice." Fume hoods which are used to control radiological hazards or to control highly toxic particulates shall be equipped with appropriate filtration.

Chemical Storage

A. Inventory -- The storage of outdated or unused chemicals in laboratories is prohibited. The Principal Investigator must be able to produce a specific reason and timetable for the intended use of every chemical stored in the laboratory. Every chemical container in a laboratory must be accurately labeled as to content.

B. Segregation -- Stored chemicals shall be segregated according to chemical compatibility. A general segregation scheme is as follows:

1. Acids
2. Bases
3. Flammable Liquids
4. Oxidizers
5. Other

C. Storage Cabinets -- Not more than a total of 10 gallons of a flammable or combustible liquid may be stored outside of a flammable liquid storage cabinet. Similarly, containers of flammable or combustible liquids of sizes which are equal to or greater than 5 gallons must be stored in flammable liquid storage cabinets.

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Significant quantities of other chemical classes such as acid, bases or oxidizers shall also be stored in cabinets which are constructed and labeled for storage of that particular chemical class.

Chemical storage cabinets are moveable equipment and the occupant department is responsible to pay for procurement.

Floor storage of chemicals is discouraged. Floor storage of chemicals in glass containers is prohibited.

Eyewashes/Showers -- Each laboratory shall be equipped with or be in immediate proximity to eyewash/shower facilities. Storage shall not block access to eyewashes/showers.

Hazardous Waste -- All lab personnel who procure, use, store, handle or dispose of regulated materials must be qualified as an "Authorized Hazardous Waste Generator." Authorization is achieved by attending Hazardous Waste Generator Training sessions. These sessions are offered each semester by EHS. Lab personnel are responsible to accurately identify the chemical, identify each container of hazardous waste and to declare materials to be a waste in a timely fashion. Lab personnel are responsible to place hazardous waste in chemically compatible containers which are securely capped/sealed. Lab personnel initiate disposal of hazardous waste by attaching labels, tags and by submitting "Request for Chemical Recycling and Disposal" forms to the EHS office. Disposal of waste by incineration, evaporation or drain disposal is strictly prohibited.

Refrigerators -- Flammable liquids shall not be stored in refrigerators/freezers unless the refrigerator is explosion proof. Explosion-proof refrigerators are classified as moveable equipment. Occupant departments pay for procurement of explosion-proof refrigerators/freezers.

First Aid Kits -- The occupant department procures First Aid Kits for laboratories. First Aid Kits shall be properly maintained with a full complement of supplies and shall be wall-mounted in an easily accessible location.

Fire Extinguishers -- 10 lb. multi-purpose dry chemical fire extinguishers are recommended for installation in laboratories. Fire extinguishers shall be wall-mounted.

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Buddy System/Observability -- Whenever possible, people should work in laboratories in groups of two or more. A person who must work alone shall notify at least one other person in the building of his/her whereabouts. Windows in laboratory doors shall not be covered. This facilitates observation of conditions in the lab by passers-by and allows emergency responders to assess conditions without having to open the door.

Compressed Gases -- Flammable gases and oxidizing gases shall be spatially separated to the greatest possible degree. All gas cylinders must be securely fastened (chains, straps, etc.) in an upright position. Caps shall be screwed over valve stems when the gas is not in use. Highly toxic gases such as H_2S, CO, CN_2, BF_3, Cl etc. should be procured in the smallest possible container and placed in fume hoods (along with gas conveyance apparatus) whenever possible. Leak-sensing devices and alarms should be installed in laboratories which contain toxic gases.

Personal Protective Equipment -- The Principal Investigator/Lab Supervisor shall procure appropriate quantities and types of personal protective equipment, including gloves, goggles, face shields, lab coats, aprons, etc... The Lab Supervisor shall give specific direction to lab personnel concerning how and when the use of personal protective equipment is required. This equipment shall be maintained in a neat, clean and readily useable condition.

Security -- Highly toxic chemicals, such as commonly known human poisons (cyanides, arsenic) and chemicals which can be used as drugs (barbital) or in the manufacture of drugs; and chemicals which are commonly known to be highly reactive (phosphorus, sodium) shall be kept in locked secure storage. Similarly, radioactive materials shall be kept in shielded, secure storage.

Signs -- Laboratories which contain radiation-producing equipment, licensed radioactive materials, biohazards, or other high risk materials shall bear exterior and interior warning signs of the type prescribed in state or federal regulations. Each laboratory shall also display the poster entitled "Hazardous Materials Emergency Procedures." This poster is distributed free-of-charge by the EHS office.

Emergency Procedures -- Lab supervisors shall review emergency procedures with lab personnel. A review of the items listed in the poster "Hazardous Materials Emergency Procedures" comprise the minimum scope of this review.

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Biohazards -- See Section F-7 of this manual for additional information.

Radiation -- See Sections F-19 and F-25 of this manual for additional information.

Fire Safety -- See Section F-46 of this manual for additional information.

Chemical Spill Response -- See Section F-13 of this manual for additional information.

Central Chemical Storage and Procurement -- See Section F-38 of this manual for additional information.

Sanitary Sewer Discharges -- See Section F-16 of this manual for additional information.

Hazardous Material Management -- See Section F-9 of this manual for additional information.

Hazardous Waste Management -- See Section F-47 of this manual for additional information.

Medical Surveillance -- See Section F-20 of this manual for additional information.

Laboratory Chemical Hygiene Program - See Section F-39 of this manual for additional information.

Management of Highly Toxic/Reactive Materials -- See Section F-24 of this manual for additional information.

Notification of Releases of Hazardous Materials -- See Sections F-14 and F-16 of this manual for additional information.

Funded Research -- See Section F-23 of this manual for additional information.

Section:	**Environmental Health and Safety (EHS)**	**Index: F-22**
Subject:	**Acquisition of Property or Equipment by Purchase or Donation**	**Page 1 of 1**

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Liability

Significant liabilities may be associated with acquisition of property or equipment. For example, mining claims may have mine drainage problems which require very expensive remediation in order to meet requirements of modern environmental regulation. Ownership of property may also make the School liable for payment of cleanup of past contamination under the "Comprehensive Environmental Response Compensation and Liability Act" (CERCLA, aka SUPERFUND). Similarly, buildings and related property may contain leaking underground gasoline tanks, asbestos or polychlorinated biphenyls. Cleanup or remediation of any of these problems can be very expensive and could easily exceed whatever value may be associated with the building or property. Donations of old chemicals or radioactive sources, ores, etc. may present the School with very expensive waste disposal problems. The cost of hazardous waste disposal is generally 10 times greater than the procurement cost of new material. Offers to donate such materials should be viewed with suspicion. Acceptance of unlicensed radioactive materials automatically puts the School in violation of State Radiation Control Regulations. Similarly, old lab equipment, fume hoods, or mining equipment may be contaminated with toxic materials and may require expensive decontamination before such material can be handled or used.

Review Procedures

All campus personnel should review donations or planned purchases of old equipment, chemicals, property or buildings with the Director of Legal Services and with the EHS Director before any change of ownership is effected.

3/2/95-Bobrept/Report23

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Adequacy of Facilities, Budget and Services

It is the responsibility of the Principal Investigator who submits a proposal for funded research to ensure that the School has the capacity in terms of equipment, facilities and support services to house the proposed project in a manner which is safe and complies with various environmental, safety and fire safety regulations. The Principal Investigator must have a thorough understanding of the costs to achieve regulatory compliance before he or she proposes or agrees to a project budget. In order to alert principal investigators to these important issues before a commitment to accomplish funded research is consummated, the Office of Research Services distributes the letter and checklist in Figures 9 and 10 to each investigator who submits a research proposal. The letter and checklist serve to notify investigators of potential problems, and invites them to contact the EHS Director for an assessment of regulatory impacts, evaluation of institutional capacity for sponsoring the proposed work, and for an evaluation of budgetary factors which may not be evident to the researcher.

Figure 9

Revised: February 27, 1992

MEMORANDUM

TO: Principal Investigators/Department Heads

FROM: Bob MacPherson, Director, EHS

SUBJECT: Research Proposal

The Office of Research Services has advised me that you recently submitted a research proposal. You and I need to coordinate our efforts to ensure that the Colorado School of Mines (CSM) can safely accommodate your project.

During the last twenty years there has been a great proliferation of state and federal regulations pertaining to occupational health, safety and environment. These regulations impose a heavy responsibility on CSM to ensure that activities in its campus facilities conform to the requirements of these rigorous health and safety standards. The number and complexity of these regulations make it difficult to predict which regulatory standards will apply. In some cases, a failure to anticipate the applicability or enforcement of these regulations can have serious legal and financial consequences for CSM and you, the Principal Investigator.

With this in mind, I request that you review the attached checklist to help you identify any health, safety and environmental issues which should be anticipated before you and CSM are committed to this project. I will be pleased to assist you in evaluating the availability of institutional resources which are required to support your research. Please call me at 273-3316 to discuss any potential problems which you anticipate as a result of your review of the checklist.

RAM/gk

Attachment

3/2/95-Bobrept/Rept24-A

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Figure 10

COLORADO SCHOOL OF MINES
RESEARCH PROPOSAL HEALTH & SAFETY CHECKLIST

1. Have you planned to provide health/safety services to protect lab workers?

OSHA has enacted a laboratory safety standard which imposes requirements to provide written plans, training, chemical information references, exposure monitoring and medical surveillance for lab workers.

2. Do you have adequate storage facilities for research materials?

The Fire Code requires that incompatible chemicals must be stored in segregated storage compartments and that flammable liquids must be stored in approved storage cabinets. The Fire Code also limits the volume of chemicals which can be stored/handled.

3. Will your storage requirements compromise the use of paths to exits?

The Fire Code prohibits the storage of chemicals, gas cylinders or equipment in a path to an exit. Similarly, adequate exit/escape routes must be provided and may not be obstructed. Storage of combustible materials in stairwells or mechanical rooms is also prohibited.

4. Will the arrangement/modification of your lab compromise the fire resistive capability of the structure?

The Fire Code and Building Code prohibit penetration/modification of fire resistive doors, walls, ceiling, etc.. Similarly, construction of partitions, walls, doors and utility outlets must conform to code requirements.

5. Is your lab adequately ventilated?

OSHA prohibits the release of toxic airborne materials in areas which are not adequately ventilated. The hood design and air velocity of ventilation systems should conform with modern standards. If highly toxic materials (radionuclides, cadmium, chromium, beryllium, thallium, lead, etc.) are used, ventilation system exhaust should be filtered to preclude release of the material to the environment. EPA and OSHA regulate the release of human carcinogens and other toxics to the environment.

6. Are you adequately prepared to handle/store highly reactive or toxic materials?

Storage and use of highly toxic materials, explosives, azides, picric acid, perchloric acid, peroxidizable organics, strong oxidizers, alkali metals, other water/air reactives may require special facilities and management practices.

7. Will you possess reportable quantities of regulated materials?

The location and quantity of certain chemicals must be annually reported to local agencies in accordance with the EPA's "Community Right-to-Know" regulation.

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8. **Will you generate infectious waste (including syringes, body fluid, animal parts), handle controlled organisms, or perform recombinant DNA research?**

The National Institutes of Health (NIH) provides guidelines for the handling of pathological organisms and genetic research materials. Special containment facilities are required for such organisms. The State regulates the disposal of infectious waste.

9. **Will you utilize radioactive materials or equipment?**

Radioactive materials (including natural mineral samples) and radiation producing equipment (including X-ray machines) must be listed on the School's Radioactive Materials License. State and Federal regulations establish strict limits for radiation exposure and release of radionuclides to the environment.

10. **Will you discharge waste water to the sewer?**

The School has a permit to discharge waste water to the sewer. This permit establishes very strict discharge limits for metals, corrosives, organics and cyanide. Discharge limits for metals are extremely restrictive. Storm sewer discharges are also regulated.

11. **Have you planned for disposal of waste?**

EPA strictly regulates the accumulation and disposal of hazardous waste. The School maintains a certain regulatory status as a waste generator. Production of large amounts of waste or production of more than 1 Kg. of "acute" waste changes the generator status of the School, and may put the School out of compliance with EPA regulations. Cost for disposal of regulated waste is extremely high.

12. **Will you utilize a laser or other equipment or procedures which subject lab personnel to significant exposure to physical agents including vibration, noise, heat, electromagnetic fields and other forms of nonionizing radiation?**

Threshold limit values for occupational exposure to physical agents are established by OSHA and ACGIH. OSHA prescribes safety procedures for use of lasers.

13. **Will you utilize custom built, high pressure vessels; robots; industrial vehicles; or equipment with rotating parts, belts, gears, pulleys or high pressure hydraulic systems?**

OSHA prescribes safety equipment and procedures associated with use of such equipment.

14. **Will you be digging holes or drilling wells?**

OSHA prescribes shoring requirement for trenches. Check with Blue Stake to ensure that you will not penetrate buried utilities. Environmental regulations may require that bore holes must be capped or filled. Abandoned or unattended mine openings must be sealed.

Revised: 11/14/91

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
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A major goal of the School's Hazardous Waste Management Program is to minimize the amount of hazardous materials in storage. This concept is especially applicable to highly reactive materials. As a general rule the storage of highly reactive or highly toxic materials on an indefinite basis with no specific reason, plan or timetable for use is prohibited. The meanings of the terms "highly reactive" or "highly toxic" are difficult to specify.

Perhaps a more useful method of identifying such materials is to simply identify some categories of notorious "bad actors" which are occasionally found in laboratories and chemical storerooms. These include:

Category	Examples
Alkali Metals	Sodium, Potassium
Pyrophoric Materials	Phosphorus
Organic Peroxides	Benzoyl Peroxide, Methyl Ethyl Ketone Peroxide
Oxidizing Gases	Fluorine, Chlorine, Oxygen
Other Strong Oxidizers	Perchloric Acid, Hydrogen Peroxide
Flammable or Toxic Gases	Hydrogen, Acetylene, Hydrogen Sulfide, Carbon Monoxide
Explosives	Azides, Fulminates, Picric Acid
Other	Hydrofluoric Acid, Arsenic Compounds, Cyanide Compounds

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If any of these kinds of materials are kept in a laboratory, there must be a specific intention and timetable for utilizing the quantity that is present. If this is not the case, lab personnel should initiate collection and disposal.

MANAGEMENT OF CHEMICALS WITH A LIMITED SHELF LIFE/PEROXIDE FORMERS

A large number of chemicals commonly found in laboratories have a limited shelf-life, and over time, form shock sensitive peroxides. The presence of outdated peroxide-forming materials in academic buildings can be very problematic. These materials can act like shock-sensitive incendiary bombs. An explosion can be initiated by simply removing the cap on the container, so it is dangerous to even open a container in order to test for the presence of peroxides. Because of this difficulty, it is customary to handle the discovery of containers of out-dated peroxide formers as if they were live bombs. The building may be evacuated or a section or room cordoned off. The bomb squad may be called in to transport the suspect material to a safe location where it can be detonated.

Because of the extreme difficulty in handling this material, as a matter of policy, the retention in storage of any untested peroxide former (including all the materials listed in the table on the following pages) for more than one year is prohibited.

For the aforementioned reasons, it is very important that lab personnel accomplish the following management tasks:

1. Produce a written inventory of chemicals in the laboratory on an annual basis and identify all materials which have a limited shelf life.

2. Ensure that peroxide-forming materials are accurately labeled. Labels should bear the name of the owner or responsible person and should indicate the dates the container was received and was opened.

3. Peroxide-forming materials should not be allowed to evaporate and should not be distilled, since this activity tends to concentrate the peroxide content.

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4. Immediately initiate disposal of material which has exceeded its shelf life or which shows evidence of peroxide formation.

5. Order minimum quantities in small containers of peroxide-forming materials.

6. Test materials for peroxide formation utilizing peroxide test strips. Accomplish peroxide testing according to the frequency indicated in the following table:

LIST 'A' (test for peroxides every 3 months)

"Peroxide Hazard on Storage"

Isopropyl ether
Divinyl acetylene
Vinylidene chloride
Potassium metal
Sodium amide

LIST 'B' (test for peroxides every 6 months)

"Peroxide Hazard on Concentration"
(Distillation or Evaporation)

Diethyl ether
Tetrahydrofuran
Dioxane
Acetal
Ethylene glycol dimethyl ether (Glyme)
Vinyl ethers
Dicyclopentadiene
Diacetylene
Methyl acetylene
Decahydronaphthalene (Decalin)
Tetrahydronaphthalene (Tetralin)
Cyclohexene
Diethylene glycol dimethyl ether (Diglyme)

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LIST 'C' (test for peroxides every 6 months)

"Hazardous Due to Peroxide Initiation of Polymerization"

Methyl methacrylate
Styrene
Acrylic acid
Acrylonitrile
Butadiene
Vinylidene chloride
Tetrafluorocthylene
Chlorotrifluornethylene
Vinyl acetylene
Vinyl chloride
Vinyl pyridine
Chloroprene

PERCHLORIC ACID

The storage of perchloric acid in a laboratory is especially problematic in that, by its very presence, it raises the possibility that the fume hood(s) in the lab may be contaminated with shock sensitive, explosive perchlorates.

Because of the difficulty associated with the use and storage of perchloric acid, it is a matter of policy that perchloric acid may not be stored in a laboratory that is only equipped with a conventional fume hood--unless lab personnel can demonstrate that their use of perchloric acid will not cause contamination of the existing hood. If this cannot be substantiated, lab personnel should initiate collection and disposal of perchloric acid.

PICRIC ACID

Picric acid (trinitrophenol) becomes a shock-sensitive high explosive when it is allowed to dry or if it becomes sensitized with common metals or ammonia. Picric acid should be kept in isolated, secure storage with bottle caps firmly in place to prevent dehydration. The container should be checked and water added as required on a quarterly basis. A label should be attached to the container to record the quarterly checks and to record the date that water was last added.

3/2/95-Bobrept/Report25

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GENERAL

Colorado School of Mines (CSM) faculty and staff utilize a variety of sealed and unsealed radioisotopes and radiation producing equipment. Use of such equipment and material is regulated by the Colorado Department of Public Health and Environment (CDPHE), Radiation Control Division. The Division has published detailed written regulations. A copy of those regulations is kept in the CSM Environmental Health and Safety (EHS) office in Chauvenet Hall. CDPHE Radiation Control Division has the legal authority to enforce these regulations on the CSM campus.

The Radiation Control Division authorizes the presence of radioactive materials on the campus by issuing a license to the School. Each radioactive source is listed in the license. The individual faculty member who is responsible for each source is also listed. The license contains additional requirements for training, waste disposal, leak testing, wipe testing, labeling and signage. All faculty, staff and students who utilize radioisotopes or radiation producing equipment shall comply with applicable provisions in the School's radioactive materials license and in State Radiation Control regulations.

CLASSIFICATION OF USERS OF RADIOACTIVE MATERIALS AND OPERATORS OF RADIATION PRODUCING EQUIPMENT

1. Operators of Radiation Producing Equipment: Radiation producing equipment includes electron microscopes, x-ray diffraction and fluorescence equipment and particle accelerators. A qualified faculty member must be responsible for the use and maintenance of each

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item of radiation producing equipment. When necessary, the Radiation Safety Committee renders binding judgment concerning the qualifications of faculty members to supervise the use of radiation producing equipment. The supervising faculty member is responsible to provide safety training to staff members and students who are authorized to operate the equipment. Only persons who are authorized and trained by the supervising faculty member are allowed to operate radiation producing equipment. Upon request, the supervising faculty member shall notify the Radiation Safety Committee concerning the identity of persons who are authorized to utilize an item of radiation producing equipment. Upon request, the supervising faculty member shall also provide documentation concerning the adequacy of safety training which has been provided to each equipment operator.

2. Authorized Users of Radioactive Materials: A qualified faculty member must be responsible for the use, storage, handling and disposal of each regulated radioactive source on the campus. Qualified faculty members apply to the Radiation Safety Committee for authorization to possess radioactive materials. The Radiation Safety Officer is the administrative point of contact for the Radiation Safety Committee in such matters. Applicant faculty members may be required to provide documentation of training and experience which qualifies them to possess the desired source. Authorized users must be specifically identified in the School's radioactive materials license. The Radiation Safety Officer applies for amendments to the license for purposes of designating new authorized users, deletion of inactive users or to change the inventory of licensed sources on the campus. The term "authorized user" applies to faculty members who are identified in the School's radioactive materials license as persons approved to possess regulated sources of radiation.

   Authorized users supervise staff members and students in handling radiation sources. Authorized users designate supervised users and assign them to function in one of two subordinate user categories: 1) directly supervised users and 2) independent supervised users. The authorized user provides personal supervision of directly supervised users at all times when these persons are handling radioactive materials. Authorized users also promote directly supervised users into the independent supervised user category after

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the individual has completed a 10-hour Radiation Safety Training course (or equivalent).

The authorized user maintains a list of subordinate users under his/her supervision. The list should indicate whether individuals are classified as directly supervised users or as independent supervised users. The list should also indicate the date that each independent supervised user completed the 10-hour Radiation Safety Course. Upon request, the authorized user shall forward an updated copy of this list to the Radiation Safety Officer.

3. Directly Supervised Users: These are persons who have not completed the 10-hour Radiation Safety Course (or equivalent). Directly supervised users may handle radioactive materials only if they are in the presence of, and under the direct personal supervision of the authorized user.

4. Independent Supervised Users: These are persons who have completed the 10-hour Radiation Safety Course (or equivalent). Independent supervised users may handle radioactive material under the general guidance and direction of the authorized user, however the authorized user need not be present to personally oversee the activities of the independent supervised user.

AVAILABILITY OF TRAINING

The Radiation Safety Officer will offer a 10-hour Radiation Safety Course each semester. The Radiation Safety Officer will widely advertise the availability of the course prior to each course offering. There will be no charge for attending the course. Completion of this course will qualify students and staff members to function as independent supervised users.

Topics to be covered during the course include:

- General Nuclide Nomenclature
- Decay Processes/Growth of Radioactive Products
- Mass/Energy Relationships
- Radiation Dosimetry
  - Absorption of Radiation by Matter
  - Biological Effects
- Radiation Detectors and Detector Calibration

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Exposure Control: Time, Distance, Shielding
Exposure Limits
- Members of the Public
- Radiation Workers
- Pregnant Women
- Persons Younger than 18 Years of Age

Laboratory Safety Procedures
- Handling of Radionuclides
- Sealed and Unsealed Sources
- Leak and Wipe Testing
- Shielding
- Labeling Signage
- Security
- Use of Dosimeters
- Inventory Control
- Waste Disposal

Application to be Authorized to Possess Radioactive Materials -- Applications should be submitted in writing to the Director of Environmental Health and Safety (Radiation Safety Officer). The Radiation Safety Officer then submits the application to the Radiation Safety Subcommittee for review and approval. The Radiation Safety Officer will submit approved applications to the Colorado Department of Public Health and Environment, Radiation Control Division. If the application is approved by the Radiation Control Division, the Division will issue a revision of the School's Radioactive Materials License. Upon receipt of the revised license, the Radiation Safety Officer will notify the applicant that he/she is authorized to procure the radioisotope(s) and proceed in accordance with information in the application and revised license. Figure 11 is a format for written application to be authorized to possess radioactive materials.

License Amendments -- Authorized users who wish to acquire additional radioisotopes, delete radioisotopes, or change the terms or procedures described in their original application or in the School's radioactive Materials License should submit a written Request for License Amendment to the Director of Environmental Health and Safety (Radiation Safety Officer). The written request should detail the specifics of the proposed amendment. The Radiation Safety Officer will submit Requests for License Amendment to the Colorado Department of Public Health and Environment.

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Dosimetry Program Participation -- All authorized users, directly supervised users, independent supervised users, faculty supervisors of radiation-producing equipment and supervised users of radiation-producing equipment shall participate in the Radiation Dosimetry Program. In addition, lab personnel who share spaces where radioactive materials or radiation-producing equipment are used may also participate in the program. The Dosimetry Program is managed by the EHS office at no charge to users.

Leak Testing of Sealed Sources -- EHS personnel will accomplish leak testing of sealed sources in accordance with license requirements.

Annual Program Review and Dose Calculations -- EHS personnel will conduct an Annual Program Review in November of each year. This will involve a visit to each site where radioactive materials or radiation-producing equipment are utilized. Public areas adjacent to each site will be surveyed to ensure that public exposures to radiation do not exceed regulatory thresholds. Each user of radioactive materials will be interviewed during the program review. Figures 12, 13, and 14 are forms that will be used to record the results of the Annual Program Review. Following the Program Review, the Radiation Safety Officer will compute the Annual Dose Calculation and Cumulative Occupational Exposure History for each user, utilizing the forms depicted in Figures 15 and 16.

Wipe Testing and Area Surveys -- Users of unsealed radioisotopes shall accomplish wipe testing and/or area surveys using an appropriate survey meter at least monthly. Results of wipe testing and area surveys shall be recorded in a log which is maintained in the user's laboratory.

Pregnant Women -- Authorized users and faculty supervisors of users of radiation-producing equipment shall inform each of their supervised female users that dose limits for pregnant women are restricted. Supervisors shall request that female users who become pregnant should immediately notify the supervisor and the Radiation Safety Officer. The supervisor and the Radiation Safety Officer will then adjust dose calculations and user procedures to ensure that dose limits for pregnant women are not exceeded.

Mixed Waste -- "Mixed Waste" is a category of waste material that is noteworthy on the basis that it is both a regulated chemical waste and a regulated radioactive waste. Mixed waste is very difficult, if not impossible, to dispose of. Therefore, authorized users should avoid the creation of mixed waste. Specifically, the use of organic scintillation cocktails should be

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avoided. Radiolabeling using long-lived radioisotopes of materials which will qualify as regulated chemical waste should also be avoided.

Package Receipt -- All packages of radioactive materials shall be initially delivered to the Central Chemical Storage and Distribution Facility (CSDF) for leak surveying and record entry. CSDF personnel will then immediately deliver the package to the authorized user.

Signs and Labels -- All sealed sources and containers of unsealed sources shall be accurately labeled and identified as sources of radiation. Entryways to laboratories which house radioactive materials or radiation-producing equipment shall bear the appropriate radiation warning sign. Each laboratory which contains radioactive materials or radiation-producing equipment shall be posted with the CDPHE Radiation Control Division "Notice to Employees." Copies of this Notice are available in the EHS office.

Inspection and Certification of Radiation-Producing Equipment -- Inspection and certification of this equipment is required every two years. The EHS office will initiate and pay for this service.

Figure 11

FORMAT FOR MAKING APPLICATION TO POSSESS RADIOACTIVE MATERIALS

[Submit this application to the Director, Environmental Health and Safety (Radiation Safety Officer). Upon request, EHS personnel will assist the applicant in formulation of the application.]

1. Applicant name, employment status, department, office number, phone number.

2. Identity of radioisotope(s), physical form, chemical matrix, sealed or unsealed, total activity, specific activity.

3. Describe applicant's qualifications to use the requested material, formal training, on-the-job training, location, dates.

4. Briefly describe research project and how radioisotopes will be utilized.

5. Identify other faculty members, students or classified staff members who may also utilize the radioisotopes under the supervision of the applicant. Designate each supervised individual as a "Directly Supervised User" or "Independent Supervised Users." If Independent Supervised Users are identified, specify the date they received training to qualify them as Independent Supervised Users.

6. Describe waste disposal procedures. Will any radioactive material be released to air or sewer? Compare predicted releases to release concentrations specified in Radiation Control Regulations.

7. Describe monthly wipe testing and/or area survey procedures and associated record keeping procedures.

8. Confirm appropriate room signage, container labeling, and posting of CDPHE "Notice to Employees."

9. Describe survey meters to be used. Describe plans for meter calibration.

10. Describe plans for notifying female users of the employer's request to immediately declare pregnancy during period of use of radioactive materials.

11. Confirm that use of radioactive materials will not result in production of a mixed waste.

12. Describe radioactive package receipt procedures. (Note -- All packages must be initially delivered to the Central Chemical Storage and Distribution Facility (CSDF) in Coolbaugh Hall for leak surveying and record entry. CSDF personnel will then immediately deliver packages to authorized user.)

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13. Describe handling procedures, equipment (i.e. fume hood) and personal protective equipment (gloves, aprons, goggles, tongs, respirators) that will be used to control potential releases or personnel exposure.

14. Describe the type of dosimeters that will be used (film badge, TLD, finger ring, whole body, etc...). Describe dosimeter control procedures (check-in/out board). Identify frequency of dosimeter reading desired (monthly, quarterly).

Figure 12

RADIOACTIVE MATERIALS
USER DATA

COLLECTED BY: _____ DATE OF LAST REVISION: _____

1. User Name _____ SSN _____
   Employment Status _____ DOB _____
   M/F _____ Declared Pregnant Y / N
   Date of Declared Pregnancy _____ Estimated Date of Conception _____

2. User Category:
   Authorized User
   Independent
   Supervised User
   Directly Supervised

3. Date of Completion of Radiation Safety Course _____ (If applicable)

4. Prior use of RPE or radioactive materials (Describe)
   _____
   _____
   _____

5. Types of sources used _____
   _____
   _____

6. Building and Room Number of Rad source use _____
   _____

7. Brief description of research _____
   _____

8. Describe safety equipment and procedures used to prevent exposure _____
   _____
   _____

9. Should air sampling or bioassay be used to determine internal exposures? ___
   _____
   _____

10. Describe waste disposal procedures _____
    _____

11. Are survey meters available and in use? _____
    _____

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12. Are all sources authorized in Rad. Materials License? _____

_____

13. Does use of sources comply with procedures in Rad. Materials License? _____

14. What type of dosimeters are used? _____
Frequency of dosimetry reports? _____

15. Has the female user been advised of the employer's request to be notified in case of pregnancy? _____

16. Is the user prepared for an emergency? _____

17. Is the lab posted with required warning and notice signs? _____

Figure 13

RADIATION PRODUCING EQUIPMENT (RPE)
EQUIPMENT DATA

COLLECTED BY: _____ DATE OF LAST REVISION: _____

1. Type/Model of RPE _____
_____

2. Building/Room No. of RPE _____

3. Name of faculty member in charge _____
What is the frequency of use of the RPE? _____

4. Is RPE inspection/certification current? _____

5. Describe equipment safeguards _____

6. Results of x-ray survey in adjacent public areas _____

7. Area dosimeters in use? _____

8. Radiation warning signs and employee notice posted? _____

9. Does the faculty member document training to users of RPE? _____

10. Who are supervised users of RPE? _____
_____

11. Do users participate in the Rad Dosimetry Program? _____
_____

12. Has the faculty member in charge advised female users of the employer's request to be notified in case of pregnancy? _____

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Figure 14

RADIATION PRODUCING EQUIPMENT (RPE)
USER DATA

COLLECTED BY: _____ DATE OF LAST REVISION: _____

1. User Name _____ SSN _____
   Employment Status _____ DOB _____
   M/F _____ Declared Pregnant __Y / N__
   Date of Declared Pregnancy _____ Estimated Date of Conception _____

2. Prior use of RPE or radioactive materials (Describe) _____
   _____
   _____
   _____

3. Type/Model of RPE _____

4. Building/Room No. of RPE _____

5. Name of faculty member in charge _____

6. Is the user a participant in the Rad Dosimetry Program? _____

7. Did the user receive training from the faculty member in charge before being authorized to use the RPE? _____

8. Does the user have any other exposures to radiation or radioactive materials on the campus? _____
   _____

9. Has the female user been advised of the employer's request to be notified in case of pregnancy? _____
   _____

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NRC FORM 5
(6-92)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

OCCUPATIONAL EXPOSURE RECORD FOR A MONITORING PERIOD

APPROVED BY OMB NO. 3150-0006
EXPIRES:

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: MINUTES FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0006), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX ☐ MALE ☐ FEMALE	5. DATE OF BIRTH

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER(S)	9A. ☐ RECORD ☐ ESTIMATE	9B. ☐ ROUTINE ☐ PSE

INTAKES

10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μCi

DOSES (in rem)

DEEP DOSE EQUIVALENT	(DDE)	11.
EYE DOSE EQUIVALENT TO THE LENS OF THE EYE	(LDE)	12.
SHALLOW DOSE EQUIVALENT, WHOLE BODY	(SDE,WB)	13.
SHALLOW DOSE EQUIVALENT, MAX EXTREMITY	(SDE,ME)	14.
COMMITTED EFFECTIVE DOSE EQUIVALENT	(CEDE)	15.
COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN	(CDE)	16.
TOTAL EFFECTIVE DOSE EQUIVALENT (BLOCKS 11 + 15)	(TEDE)	17.
TOTAL ORGAN DOSE EQUIVALENT, MAX ORGAN (BLOCKS 11 + 16)	(TODE)	18.

19. COMMENTS

20. SIGNATURE -- LICENSEE	21. DATE PREPARED

INSTRUCTIONS AND ADDITIONAL INFORMATION PERTINENT TO THE COMPLETION OF NRC FORM 5

(All doses should be stated in rems)

1. Type or print the full name of the monitored individual in the order of last name (include "Jr," "Sr," "III," etc.), first name, middle initial (if applicable).

2. Enter the individual's identification number, including punctuation. This number should be the 9-digit social security number if at all possible. If the individual has no social security number, enter the number from another official identification such as a passport or work permit.

3. Enter the code for the type of identification used as shown below:

CODE	ID TYPE
SSN	U.S. Social Security Number
PPN	Passport Number
CSI	Canadian Social Insurance Number
WPN	Work Permit Number
IND	INDEX Identification Number
OTH	Other

4. Check the box that denotes the sex of the individual being monitored.

5. Enter the date of birth of the individual being monitored in the format MM/DD/YY.

6. Enter the monitoring period for which this report is filed. The format should be MM/DD/YY - MM/DD/YY.

7. Enter the name of the licensee.

8. Enter the NRC license number or numbers.

9A. Place an "X" in Record or Estimate. Choose "Record" if the dose data listed represent a final determination of the dose received to the best of the licensee's knowledge. Choose "Estimate" only if the listed dose data are preliminary and will be superseded by a final determination resulting in a subsequent report. An example of such an instance would be dose data based on self-reading dosimeter results and the licensee intends to assign the record dose on the basis of TLD results that are not yet available.

9B Place an "X" in either Routine or PSE. Choose "Routine" if the data represent the results of monitoring for routine exposures. Choose "PSE" if the listed dose data represents the results of monitoring of planned special exposures received during the monitoring period. If more than one PSE was received in a single year, the licensee should sum them and report the total of all PSEs.

10A. Enter the symbol for each radionuclide that resulted in an internal exposure recorded for the individual, using the format "Xe-999x," for instance, Cs-137 or Tc-99m.

10B. Enter the lung clearance class as listed in Appendix B to 10 CFR Part 20.1001-2401 (D, W, Y, V, or O for other) for all intakes by inhalation.

10C. Enter the mode of intake. For inhalation, enter "H." For absorption through the skin, enter "B." For oral ingestion, enter "G." For injection, enter "J."

10D. Enter the intake of each radionuclide in μCi.

11. Enter the deep dose equivalent (DDE) to the whole body.

12. Enter the eye dose equivalent (LDE) recorded for the lens of the eye.

13. Enter the shallow dose equivalent recorded for the skin of the whole body (SDE,WB).

14. Enter the shallow dose equivalent recorded for the skin of the extremity receiving the maximum dose (SDE,ME).

15. Enter the committed effective dose equivalent (CEDE) or "NR" for "Not Required" or "NC" for "Not Calculated".

16. Enter the committed dose equivalent (CDE) recorded for the maximally exposed organ or "NR" for "Not Required" or "NC" for "Not Calculated".

17. Enter the total effective dose equivalent (TEDE). The TEDE is the sum of items 11 and 15.

18. Enter the total organ dose equivalent (TODE) for the maximally exposed organ. The TODE is the sum of items 11 and 16.

19. Signature of the person designated to represent the licensee.

20. Enter the date this form was prepared.

21. COMMENTS.
In the space provided, enter additional information that might be needed to determine compliance with limits. An example might be to enter the note that the SDE,ME was the result of exposure from a discrete hot particle. Another possibility would be to indicate that an overexposed report has been sent to NRC in reference to the exposure report.

PRIVACY ACT STATEMENT

Pursuant TO 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the U.S. Nuclear Regulatory Commission on NRC Form 5. This information is maintained in a system of records designated as NRC-27 and described at 55 Federal Register 33984 (August 20, 1990), or the most recent Federal Register publication of the Nuclear Regulatory Commission's "Republication of Systems of Records Notices" that is available at the NRC Public Document Room, Gelman Building, Lower Level, 2120 L Street NW, Washington, D.C.

1. **AUTHORITY:** Sections 53, 63, 65, 81, 103, 104, 161(b), and 161(o) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2073, 2093, 2095, 2111, 2133, 2134, 2201(b), and 2201(o)). The authority for soliciting the social security number is 10 CFR Part 20.

2. **PRINCIPAL PURPOSE(S):** The information is used by the NRC in its evaluation of the risk of radiation exposure associated with the licensed activity and in exercising its statutory responsibility to monitor and regulate the safety and health practices of its licensees. The data permits a meaningful comparison of both current and long-term exposure experience among types of licensees and among licensees within each type. Data on your exposure to radiation is available to you upon your request.

3. **ROUTINE USE(S):** The information may be used to provide data to other Federal and State agencies involved in monitoring and/or evaluating radiation exposure received by individuals employed as radiation workers on a permanent or temporary basis and exposure received by monitored visitors. The information may also be disclosed to an appropriate Federal, State, or local agency in the event the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** It is voluntary that you furnish the requested information, including social security number; however, the licensee must complete NRC Form 5 on each individual for whom personnel monitoring is required under 10 CFR 20.2106. Failure to do so may subject the licensee to enforcement action in accordance with 10 CFR 20.2401. The social security number is used to assure that NRC has an accurate identifier not subject to the coincidence of similar names or birthdates among the large number of persons on whom data is maintained.

5. **SYSTEM MANAGER(S) AND ADDRESS:**
REIRS Project Manager
Office of Nuclear Regulatory Research
U S Nuclear Regulatory Commission
Washington, DC 20555

NRC FORM 4
(6-92)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

CUMULATIVE OCCUPATIONAL EXPOSURE HISTORY

APPROVED BY OMB NO. 3150-0005
EXPIRES:

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: MINUTES. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0005), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX: MALE / FEMALE	5. DATE OF BIRTH

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER	9. RECORD / ESTIMATE / NO RECORD	10. ROUTINE / PSE

11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER	9. RECORD / ESTIMATE / NO RECORD	10. ROUTINE / PSE

11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER	9. RECORD / ESTIMATE / NO RECORD	10. ROUTINE / PSE

11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER	9. RECORD / ESTIMATE / NO RECORD	10. ROUTINE / PSE

11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

6. MONITORING PERIOD	7. LICENSEE NAME	8. LICENSE NUMBER	9. RECORD / ESTIMATE / NO RECORD	10. ROUTINE / PSE

11. DDE	12. LDE	13. SDE, WB	14. SDE, ME	15. CEDE	16. CDE	17. TEDE	18. TODE

19. SIGNATURE OF MONITORED INDIVIDUAL	20. DATE SIGNED	21. CERTIFYING ORGANIZATION	22. SIGNATURE OF DESIGNEE	23. DATE SIGNED

NRC FORM 4 (6-92)

Figure 16

INSTRUCTIONS AND ADDITIONAL INFORMATION PERTINENT TO THE COMPLETION OF NRC FORM 4

(All doses should be stated in rems)

1. Type or print the full name of the monitored individual in the order of last name (include "Jr," "Sr," "III," etc.), first name, middle initial (if applicable).

2. Enter the individual's identification number, including punctuation. This number should be the 9-digit social security number if at all possible. If the individual has no social security number, enter the number from another official identification such as a passport or work permit.

3. Enter the code for the type of identification used as shown below:

CODE	ID TYPE
SSN	U.S. Social Security Number
PPN	Passport Number
CSI	Canadian Social Insurance Number
WPN	Work Permit Number
IND	INDEX Identification Number
OTH	Other

4. Check the box that denotes the sex of the individual being monitored.

5. Enter the date of birth of the individual being monitored in the format MM/DD/YY.

6. Enter the monitoring period for which this report is filed. The format should be MM/DD/YY - MM/DD/YY.

7. Enter the name of the licensee or facility not licensed by NRC that provided monitoring.

8. Enter the NRC license number or numbers.

9. Place an "X" in Record, Estimate, or No Record. Choose "Record" if the dose data listed represent a final determination of the dose received to the best of the licensee's knowledge. Choose "Estimate" only if the listed dose data are preliminary and will be superseded by a final determination resulting in a subsequent report. An example of such an instance would be dose data based on self-reading dosimeter results and the licensee intends to assign the record dose on the basis of TLD results that are not yet available

10 Place an "X" in either Routine or PSE Choose "Routine" if the data represent the results of monitoring for routine exposures. Choose "PSE" if the listed dose data represents the results of monitoring of planned special exposures received during the monitoring period. If more than one PSE was received in a single year, the licensee should sum them and report the total of all PSEs.

11. Enter the deep dose equivalent (DDE) to the whole body.

12. Enter the eye dose equivalent (LDE) recorded for the lens of the eye.

13. Enter the shallow dose equivalent recorded for the skin of the whole body (SDE,WB).

14. Enter the shallow dose equivalent recorded for the skin of the extremity receiving the maximum dose (SDE,ME).

15. Enter the committed effective dose equivalent (CEDE).

16. Enter the committed dose equivalent (CDE) recorded for the maximally exposed organ.

17. Enter the total effective dose equivalent (TEDE). The TEDE is the sum of items 11 and 15.

18. Enter the total organ dose equivalent (TODE) for the maximally exposed organ. The TODE is the sum of items 11 and 16.

19. Signature of the monitored individual. The signature of the monitored individual on this form indicates that the information contained on the form is complete and correct to the best of his or her knowledge.

20. Enter the date this form was signed by the monitored individual.

21. (OPTIONAL) Enter the name of the licensee or facility not licensed by NRC, providing monitoring for exposure to radiation (such as a DOE facility) or the employer if the individual is not employed by the licensee and the employer chooses to maintain exposure records for its employees.

22. (OPTIONAL) Signature of the person designated to represent the licensee or employer entered in Item 21. The licensee or employer who chooses to countersign the form should have on file documentation of all the information on the NRC Form 4 being signed.

23 (OPTIONAL) Enter the date this form was signed by the designated representative.

PRIVACY ACT STATEMENT

Pursuant TO 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the U.S. Nuclear Regulatory Commission on NRC Form 4. This information is maintained in a system of records designated as NRC-27 and described at 55 Federal Register 33984 (August 20, 1990), or the most recent Federal Register publication of the Nuclear Regulatory Commission's "Republication of Systems of Records Notices" that is available at the NRC Public Document Room, Gelman Building, Lower Level, 2120 L Street NW, Washington, D C.

1. **AUTHORITY:** Sections 53, 63, 65, 81, 103, 104, 161(b), and 161(o) of the Atomic Energy Act of 1954, as amended (42 U.S C 2073, 2093, 2095, 2111, 2133, 2134, 2201(b), and 2201(o)). The authority for soliciting the social security number is 10 CFR Part 20.

2. **PRINCIPAL PURPOSE(S):** The information is used by the NRC in its evaluation of the risk of radiation exposure associated with the licensed activity and in exercising its statutory responsibility to monitor and regulate the safety and health practices of its licensees. The data permits a meaningful comparison of both current and long-term exposure experience among types of licensees and among licensees within each type. Data on your exposure to radiation is available to you upon your request.

3. **ROUTINE USE(S):** The information may be used to provide data to other Federal and State agencies involved in monitoring and/or evaluating radiation exposure received by individuals employed as radiation workers on a permanent or temporary basis and exposure received by monitored visitors The information may also be disclosed to an appropriate Federal, State, or local agency in the event the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** It is voluntary that you furnish the requested information, including social security number; however, the licensee must complete NRC Form 5 on each individual for whom personnel monitoring is required under 10 CFR 20.2106. Failure to do so may subject the licensee to enforcement action in accordance with 10 CFR 20 2401. The social security number is used to assure that NRC has an accurate identifier not subject to the coincidence of similar names or birthdates among the large number of persons on whom data is maintained

5. **SYSTEM MANAGER(S) AND ADDRESS:**
REIRS Project Manager
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

All boilers in institution facilities will be inspected annually by the Colorado Dept. of Labor, Division of Labor, Boiler Inspection Division in accordance with Article 9-4-103 of the Boiler and Pressure Vessel Inspection Law of 1993.

Other pressure vessels containing above 15 psi. and used in institution facilities (including, but not limited to, compressed air systems, autoclaves laboratory/ research equipment) should display markings indicating certification by a nationally recognized recognized standards or testing authority (UL, ASTM, etc.) for operation at internal pressures at or above those encountered in actual usage.

Users of pressure vessels in institution facilities should inspect them regularly for evidence of fatigue, corrosion or physical damage. If any deterioration is noted the pressure vessel should be tested and re-certified by a competent testing facility.

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

The Environmental Health and Safety Office (EHS) will work in cooperation with the institutions Human Resources Department and the State Division of Risk Management to reduce Worker's Compensation liability and liability from injury to persons who are not employed by the institution. Specifically, EHS will investigate claims filed against the institution and act as liaison with the Colorado Compensation Insurance Authority in preparation of responses to claims.

EHS will independently identify hazards which could create liability to the institution and initiate action to eliminate or mitigate them. EHS will also provide training to employees and students on subjects that will help to reduce risk in certain identified problem areas, such as laboratory safety or exposure to chemicals in the work place.

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

One of the most common causes of fatal industrial accidents is entry by workers into confined spaces which contain hazardous atmospheres. The regulations contained in 29 CFR, 1910.146 of the Occupational Health and Safety Act (OSHA) detail a good program for the protection of employees working in confined spaces. Though the institution is not under the jurisdiction of that law, it has been adopted as the model for confined space work in facilities controlled by the institution.

Training for confined space workers will be Provided by the Environmental Health and Safety (EH&S) Office consistent with the OSHA regulations. EH&S will also coordinate the permitting process and record keeping described in those regulations. Plant Facilities Dept. personnel will cooperate with the EH&S Office in meeting these objectives by following specific operational rules described in the Confined Space Entry Policies and Procedures document (Figure 17) available through the EH&S Office.

3/3/95-Bobrept/Report29

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CONFINED SPACE ENTRY POLICIES AND PROCEDURES

Background:

One of the most common causes of fatal industrial accidents is entry by workers into confined spaces which contain hazardous atmospheres. This document is intended to establish safety procedures for confined space entry in accordance with guidance provided by OSHA in 29 CFR Part 1910.146.

Definition of Confined Space:

A confined space is defined by OSHA as follows:

1. large enough to bodily enter;
2. has limited means of entry, exit, or restricted exit;
3. not designed for continuous occupancy;
4. contains one of the following hazards:

    a. potential for hazardous atmospheres;
    b. potential for engulfment hazard;
    c. potential entrapment by converging walls or floor;
    d. any other serious safety hazard.

Categories of Confined Spaces:

For purposes of this document, confined spaces are divided into two categories: low risk spaces and high risk spaces. These are defined as follows:

1. **Low-risk spaces** are those in which the primary hazard is remoteness, difficult communication, confinement and consequences of physical hazards such as slips, falls, head strikes, etc.. .

2. **High-risk spaces** are those where hazardous atmospheres may be present and where quick rescue would be impeded by hazardous atmospheres or by the physical configuration of the space. Hazardous atmospheres are those which:

    a. contain toxic gases;
    b. are oxygen deficient or enriched;
    c. contain flammable/explosive vapors or gases;
    d. are excessively hot;
    e. confined areas where welding or use of cutting torch or other open flame device is planned.

General Procedural Concept:

Effective control of confined space entry is a complex task on the CSM campus. The regulatory definition of confined space is broad and will apply to numerous and varied locations. Similarly, Plant maintenance operations are highly varied. In some cases the need for confined space entry cannot be predicted beforehand. In addition, large numbers of people are involved including representatives of several departments and outside contractors. In order to make this policy effective and practical, it is intended to allow shop foremen and project supervisors to independently issue permits and coordinate activities related to worker entry into low risk spaces such as meter vaults, electrical vaults, crawlspaces, utility vaults and newer sections of the utility tunnels. Environmental Health and Safety personnel will issue permits and prescribe the use of protective equipment and special procedures in areas which are categorized as high risk spaces. This includes manholes, tanks, vaults which may contain hazardous atmospheres, locations where hot work may occur and in older sections of utility tunnels. The key factors in making this system work are participation, attentiveness and prior planning on the part of shop foremen, project supervisors and on-site workers.

Training:

EHS personnel will provide annual confined space entry training for all Plant personnel and housing maintenance workers. EHS personnel will also provide training to persons who are involved in a planned entry into a high risk confined space. This training will be specifically tailored to hazards which apply to each high risk entry.

Identification of Confined Spaces:

Plant and housing managers, supervisors and shop foremen are responsible to identify spaces within their area of jurisdiction which fall within the aforementioned OSHA definition of "confined space." Lists of confined spaces shall be submitted to the EHS Director. EHS personnel will categorize each space as a high risk or low risk area. These lists will be reviewed and updated each year during the annual training period. Attachment 1 is the list of confined spaces and categories. Plant facilities will sign or stencil a hazard warning at the entrance to each confined space. The warning will read "Warning--Confined Space Hazard--Entry Permit Required."

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Equipment:

The organization which has a need to accomplish confined space entry is responsible to procure and maintain safety equipment which is required for entry. Plant Facilities provides equipment for the use of outside contractors or ensures that contractors arrange to provide their own equipment. Equipment which may be required includes:

1. Radios
2. Protective Clothing, Boots, Gloves
3. Hard Hats
4. Gas Detection Devices
5. Harnessess
6. Retrieval Systems (winches, tripods, safety lines)
7. Portable Ventilators
8. Emergency Escape Breathing Apparatus

Procedures:

General: No CSM employee or contractor should enter a confined space unless the activity has been discussed and planned beforehand with a shop foreman or project supervisor. Foremen or project supervisors may independently issue permits and authorize entry into low-risk spaces. Foremen and supervisors should contact EHS personnel for assistance if entry into a high-risk space is planned.

Organization: One or more persons may be authorized to enter a confined space. At least one person must stay outside the space and maintains visual, oral or radio contact with the space entrant(s). If the space entrant encounters difficulty, the entry monitor will seek assistance by the most effective means. Usually this will be by calling Public Safety, Fire Department, EHS personnel or shop foremen by radio or telephone. The foreman or supervisor should ensure that entry monitors are trained and have access to communications equipment. Supervisors should ensure that emergency responders are available and are monitoring the telephone or radio frequency which may be used by the entry monitor. The task of the entry monitor is to call for assistance if necessary; not to effect rescue.

Permits: The shop foreman or project supervisor may issue permits for entry into low-risk spaces. Permits shall be carried by authorized entrants during the entry period. Copies of the permit should be routed to the EHS office via the organizational chain of authority within the department which sponsors the entry activity. Attachment 2 is a blank copy of the permit which will be used.

EHS personnel will issue permits for entry into high-risk spaces.

Coordination: Supervisors of workers who need to accomplish confined space entry are responsible to coordinate, plan and schedule the following activities:

1. Assemble entry participants and assign tasks/roles.
2. Ensure the availability of protective equipment.
3. Schedule a time for procedural and equipment training with the EHS Director if the operation involves entry into a high-risk space.
4. Schedule a specific time/date for the entry operation and ensure beforehand that all participants and equipment are notified, available and prepared.

Planning/Communication: Entry into high-risk spaces may require extensive planning, equipment and coordination of schedules. Shop foremen and supervisors are responsible to plan and coordinate with tunnel entrants, monitors, Plant Facilities managers and EHS personnel well in advance of a planned entry into a high-risk space. EHS personnel will provide timely assistance in the event of unpredictable maintenance emergencies.

Utility Tunnels: New sections of the utility tunnel system which are in good repair and do not contain obvious hazards will be categorized as low-risk spaces. Foremen may independently authorize work entry into new sections of utility tunnels and may independently issue entry permits. Foremen should enforce the following procedures for worker entry into low-risk areas of the utility tunnel system:

1. Tunnel entry team consists of at least two persons.
2. Tunnel entry team maintains radio contact with an entry monitor.
3. Entry monitor takes a position outside the tunnel where radio contact with the tunnel entry team can be continuously maintained.
4. Tunnel entry team is equipped with hard hats and emergency escape breathing apparatus.

Older sections of the tunnel system which are in poor repair and/or have restricted access/passage are classified as high-risk spaces. EHS personnel will issue permits for entry into high-risk areas of the tunnel system. EHS personnel will also prescribe safety procedures, equipment and organization as required for each high-risk entry.

Applicability: The general concepts and procedures described in this document are applicable to confined space entry activities which are undertaken by maintenance personnel, outside contractors, academic departments, researchers, students, faculty and other staff members.

ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

☐ CONFINED SPACE ENTRY PERMIT
☐ HAZARDOUS AREA ENTRY PERMIT

1

LOCATION and DESCRIPTION of Confined Space _____ Date _____

PURPOSE of Entry _____ Time _____ M

DEPARTMENT _____ Expiration _____ M

PERSON in Charge of Work _____

2

SUPERVISOR (S) in Charge of Crews	Type of Crew	Phone

3

SPECIAL REQUIREMENTS	Yes	No		Yes	No
Lock Out — De-energize			Escape Harness		
Lines Broken — Capped or Blanked			Tripod emergency escape unit		
Purge — Flush and vent			Lifelines		
Ventilation			Fire Extinguishers		
Secure Area			Lighting		
Breathing Apparatus			Protective Clothing		
Resuscitator — Inhalator			Respirator		

4

TEST(S) TO BE TAKEN (Valid for one 8-hour turn only)	P.E.L. *	YES	NO	DATE M	DATE M	DATE M	DATE M	DATE M	DATE M	DATE M	DATE M
% of Oxygen	-19.5% +21%										
% of L.E.L. *	Any % over 10										
Carbon Monoxide	50 ppm										
Aromatic Hydrocarbon	10 ppm										
Hydrocyanic Acid	10 ppm										
Hydrogen Sulfide	10 ppm										
Sulfur Dioxide	5 ppm										
Ammonia	25 ppm										

GAS TESTER _____ Name

Note: Continuous/periodic tests shall be established before beginning job. Any questions pertaining to test requirements contact certified division gas tester, Plant Gas Coordinator or the Industrial Hygienist

5

INSTRUMENTS USED Name	Type	Ident. No.

YES ☐
NO ☐

SAFETY STANDBY PERSON(S) Name	Ck. No.

AMBULANCE
FIRE

Supv. authorizing all above conditions satisfied _____

* P.E.L. Permissible Entry Level
* L.E.L. Lower Explosion Level

Orig. to Dept.
Copy to Safety

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Attachment #1

LIST OF CONFINED SPACES AT COLORADO SCHOOL OF MINES

Description	Location	Risk Category
Tunnel System	Heating Plant to Intersection with Coolbaugh Tunnel	L
	Intersection of main tunnel with Coolbaugh tunnel to Stratton vault	L
	Abandoned tunnel from Stratton vault to Chauvenet Hall	H
	Abandoned tunnels from Chauvenet to Guggenheim Hall & Arthur Lakes Library	H
	Abandoned tunnel from Stratton vault going east toward Hill Hall	H
	Main tunnel from Stratton vault to intersection with Meyer Hall tunnel. This includes intersecting tunnels from Hill Hall and Green Center	H
	Intersection of Meyer Hall tunnel and main tunnel to USGS and all connecting tunnels	H
	Meyer Hall Tunnel	L
	Intersection of Meyer Hall tunnel and main tunnel to interstection of Brown Hall tunnel and main tunnel	L
	Brown Hall Tunnel	L
	Intersection of Brown Hall tunnel and main tunnel to intersection of Berthoud Hall and main tunnel	L
	Berthoud Hall Tunnel	L
	Intersection of Berthoud Hall tunnel and main tunnel to Steinhauer Field House/ Volk Gymnasium	L
	Steinhauer Field House/Volk Gymnasium to intersection of main tunnel and Coolbaugh Hall tunnel	L
	Coolbaugh Hall Tunnel	L
	Intersection of Coolbaugh Hall tunnel and main tunnel to heating plant/ Stratton vault tunnel	L

LIST OF CONFINED SPACES AT COLORADO SCHOOL OF MINES

Description	Location	Risk Category
Manholes	Northeast corner of Stu. Dev. Ctr.	H
	1800 Maple St.	H
	Water meter manhole at Twin Towers	H
	Water meter manhole at CSMRI	L
	Manhole at soutwest corner Randall Hall	H
	South side of Plant Facilities Office	H
	14th St. & Cheyenne St. intersection	H
	14th St. & Illinois St. intersection	H
	Volk Gymnasium parking lot	L
	Brown Hall upper parking lot	H
	North side of Stu. Dev. Ctr.	H
	Steam vault, 14th & Cheyenne intersection	H
	Vault at southeast corner of Mil. Sci.	L
All sanitary sewer manholes	Campus	H
Inside of ventilation chambers/ducts	Campus	L

7/29/92-tunlntre-E

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

General

The Board of Trustees and the Administration of the Colorado School of Mines have approved a plan for institutional environmental health and safety program development. The plan calls for annual allocation of institutional funds to pay for projects in the category of "Safety Related Minor Capital Improvements" (SRMCI). SRMCI projects are identified by Department Heads and Business Affairs Directors. Each year, they are invited to submit written proposals for funding of SRMCI projects. These proposals are evaluated by the University Safety Committee. The Committee assesses the SRMCI proposals, and makes recommendations to the Vice President for Academic Affairs concerning project priorities. The Academic Vice President makes final decisions concerning the allocation of SRMCI funds to departments.

SRMCI Projects

Enhanced safety or environmental protection are the distinguishing characteristics of SRMCI projects and will be the primary reasons for investment of institutional funds in such projects. SRMCI projects are those with an "intermediate" price tag of $1,000 - $10,000. The cost of SRMCI projects generally exceeds the capacity of a departmental operating budget, but is less than the cost of a major capital improvement. Procurement of safety-related equipment, consumable items and services which are incidental to normal departmental operations and which cost less than $1,000 should be funded from the departmental operating budget.

Major capital improvements are higher-priced projects which are identified and managed by Plant Facilities or by the central administration. Major capital improvements are subject to external approval and may receive funds

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from external agencies. Cost for major capital improvements will generally be more than $10,000.

Examples of projects which fit into the three aforementioned funding categories are as follows:

A. Departmental Operating Expenses (less than $1,000):

- First Aid/CPR Training
- First Aid Kits
- Safety Goggles/Face Shields
- Hearing Protection
- Gloves, Aprons
- Chemical Containers/Storage Cabinets

B. Safety Related Minor Capital Improvements ($1,000 - $10,000):

- Acquisition of micro-scale analytical equipment which would reduce the production of hazardous waste.

- Installation of fume hood filtration devices for use with radioactive aerosols or highly toxic particulates.

- Acquisition of glove boxes and biological safety cabinets.

- Acquisition of portable air-cleaning devices to control welding fumes.

C. Major Capital Improvements (more than $10,000):

- Building Mechanical System Upgrades
- Utility Upgrades
- Remodels, Additions
- Space Reconfiguration
- New Structures

Proposals

Each year, the Vice President for Academic Affairs will issue a written request for SRMCI proposals to Department Heads and Business Affairs Directors. They respond by submitting brief, written proposals to the

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Environmental Health and Safety office. Written proposals should include the following information:

- Project Description
- Estimated Cost
- A brief explanation (one page or less) of how the project will improve safety or environmental protection, and why it should be funded.

Review of Proposals

The EHS Director will accomplish a preliminary assessment of proposals in terms of safety and environmental impact. The EHS Director will prioritize the proposals according to this assessment and will submit the prioritized list to the University Safety Committee for review. The Safety Committee will review the list and will reprioritize proposals. The Committee will then publish a preliminary list of prioritized proposals. The preliminary list will be issued to Department Heads and Business Affairs Directors for review and comment. They will be invited to submit additional documentation (one page or less) to substantiate requests for SRMCI funding for individual projects. Departmental and Business Affairs representatives will also be invited to appear before the Committee to make brief presentations (ten minutes or less) in support of their proposals. The Committee will then re-evaluate the list of proposals and will submit recommendations to the Vice President for Academic Affairs concerning project priorities. The Academic Vice President makes final decisions concerning the allocation of SRMCI funds to departments. The list of proposals will be generated anew each year. Proposals which are not funded will not be carried forward.

Leftover funds must be returned by Departments to the EHS office.

Annual Schedule (Approximate Dates)

9/01 Vice President for Academic Affairs invites proposals from Department Heads and Business Affairs Directors.

9/30 Department Heads and Business Affairs Directors submit written SRMCI proposals to EHS office. EHS develops an initial prioritized list.

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10/30 Safety Committee reviews proposals and develops a preliminary list of prioritized projects.

11/15 Department Heads and Business Affairs Directors review and comment on preliminary committee findings. They are invited to submit additional documentation to support proposals.

12/07 Safety Committee meets to review additional departmental submittals and to hear presentations by Departmental and Business Affairs representatives. Safety Committee submits project priority recommendations to Academic Vice President.

12/31 Academic Vice President makes final decision concerning allocation of funds and initiates fund distribution.

4/30 EHS checks back with departments to confirm status of project completion.

5/30 Unexpended funds are returned by departments to EHS.

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Section:	**Environmental Health and Safety (EHS)**	**Index: F-30**
Subject:	**Employee Use of Video Display Terminals and Computer Work Stations**	**Page 1 of 1**

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

The institution will strive to eliminate unhealthy or potentially injurious work station configurations involving Video Display Terminals (VDT's), keyboards and other computer equipment. Reasonable consideration will be given to lighting, glare and other elements of visual fatigue as well as ergonomic factors when designing work stations and selecting new equipment. Reasonable and practical measures (such as anti-glare screens, improved lighting, adjustable seating and keyboard support) will be taken to mitigate problems identified in existing office configurations.

The EHS Office will evaluate work station configuration, lighting and other potentially harmful elements where negative health effects have been recorded or where employees express concern over potential health effects through the Employee Report of Unsafe Condition procedure. Recommendations will be made concerning equipment, work routines, etc. to help alleviate identified problems.

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All accidents involving death, significant injury (requiring medical attention), the potential for significant injury (such as an explosion where injury would have occurred if people had been closer), significant property damage ($100+), releases of hazardous materials or discharge of a fire extinguisher should be reported to the Environmental Health and Safety (EHS) Office with as little delay as possible, but not more than 24 hours. Persons involved in such incidents, or witnessing them should identify themselves and make themselves available to be interviewed by EHS personnel.

If a work related injury or illness occurs, the employee should contact the Human Resources Dept. for special procedures to obtain authorized medical treatment under Workers Compensation. If an injury is life-threatening the employee should seek medical attention at the nearest emergency medical facility without delay.

The EHS Office will investigate all significant accidents, as described in the initial paragraph. Supervisors (of students or employees) are the primary accident prevention authorities in areas where the people reporting to them work. They should be available to discuss their actions in any EHS investigation. The intent of the EHS investigation will not be to assign blame, but rather to establish the causal elements and determine if any action is justified to prevent a recurrence of the incident.

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Replaces: N/A
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Institution employees should initially report unsafe conditions, verbally, to their supervisor. If the initial verbal report does not prompt an adequate response, the concerned employee should file a follow-up, written report by filling out an Employee Report of Unsafe Condition Form (Figure 18) which should be available either at their Department Office or at the Environmental Health and Safety Office. Copies of the completed form should be given to the supervisor and to the institutions Safety Officer. The Supervisor and the Safety Officer will discuss the problem and determine and appropriate response action. The supervisor should then inform the concerned employee of the response as soon as possible and not later than two weeks following the submission of the employee's written report.

COLORADO SCHOOL OF MINES

EMPLOYEE REPORT OF UNSAFE CONDITION

Instructions: Initial reports of unsafe conditions should be made directly and verbally by the concerned employee to his/her immediate supervisor. If the initial verbal report does not prompt an adequate response, the concerned employee may originate a followup written report of the unsafe condition by filling out and submitting this form to his/her supervisor with a copy to the CSM Safety Officer. The CSM Safety Officer and the supervisor will discuss the problem and will determine an appropriate response action. The supervisor should then inform the concerned employee of the response as soon as possible and not later than two weeks following submission of the employee's report.

1. **Reported by:**_____
   (Name)

2. **Shop:**_____

3. **Date:**_____

4. **Submitted to:**_____
   (Name of Supervisor/Foreman)

5. **Send copy to Safety Officer in EHS Office.**

6. **Description of Unsafe Condition:**_____

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Indoor Air Quality

Within its facilities, the institution will strive to provide a work environment that is free from harmful or unpleasant airborne pollutants.

The Environmental Health and Safety Office will investigate complaints concerning indoor air quality and make recommendations to resolve those problems.

In no instance will the concentrations of pollutants be allowed to exceed the standards contained in 29 CFR, Sub-part Z (Toxic and Hazardous Substances), Section 1910.1000 (Air Contaminants) without taking remedial action.

Asbestos concentrations will not be allowed to exceed .01 fibers/cu. cm., in accordance with C.R.S. Title 25, Article 7, Part 5, without taking remedial action.

Radon gas concentrations will not be allowed to exceed 4 Pci/L without taking remedial action.

Smoking is prohibited in all buildings of the institution in compliance with the Governor's Executive Order, Figure 19.

Executive Order regarding Smoking in State Buildings

WHEREAS, it is the responsibility of the State of Colorado to promote a safe and healthy environment for all employees and for the public;

WHEREAS, involuntary smoking, also known as passive smoking, has been associated with lung and cervical cancer in non-smoking adults;

WHEREAS, involuntary smoking increases the risk of illness among persons who suffer from allergies, cardiovascular disease, and pulmonary disease;

WHEREAS, environmental tobacco smoke results in increased workload on ventilator systems, increased fire insurance and increased maintenance costs;

WHEREAS, simple separation of smokers and non-smokers within the same air space may reduce, but does not eliminate, exposure of non-smokers to environmental tobacco smoke;

WHEREAS, the technology for the cost effective filtration of tobacco smoke from the air is currently not available;

WHEREAS, studies indicate that the cost of health care for smokers is appreciably higher than the costs for non-smokers;

WHEREAS, the elimination of worksite smoking has been related to increased employee productivity and morale, reduced absenteeism and legal risk;

WHEREAS, I encourage the legislative and judicial branches of government to prohibit smoking in state buildings under the jurisdiction of those branches of government;

NOW, THEREFORE, I, Roy Romer, Governor of the State of Colorado under and pursuant to the authority vested in me under the Constitution and laws of Colorado, DO HEREBY ORDER THAT:

1. Smoking and the sale of tobacco products are prohibited in all buildings owned or leased by the state under the control of the executive branch except as provided below.

2. Within an agency, only the residential portions of facilities operated by these agencies are exempt from the Executive Order. Those departments shall develop a policy specific to such facilities that is in keeping with the intent of this Executive Order. These policies shall be submitted to the Executive Director of the Department of Personnel by March 1, 1991.

3. Agency directors responsible for motor pool and special use vehicles are encouraged to develop a policy for those vehicles consistent with the intent of this Executive Order.

4. Signs shall be posted at building entrances and other obvious public areas stating smoking is prohibited.

5. Willful violation of this Executive Order may subject an employee to corrective and/or disciplinary action.

6. Executive Directors and Presidents of institutions of higher education are responsible for the enforcement of this Executive Order and are encouraged to facilitate smoking cessation efforts for interested employees.

7. If the Executive Director of any department or President of any institution of higher education finds that extraordinary circumstances may require an exception to this order, that person shall communicate these circumstances to the Chief of Staff of the Governor's Office, who must approve each such exception.

8. This Executive Order is effective January 1, 1991.

Issued by: R.A. MacPherson, Director, EHS
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Jurisdiction

Annual inspections of all institutional facilities will be conducted by teams composed of Safety Committee members, Plant Facilities management and EHS personnel. The EHS office may also conduct spot checks of facilities under the control of the institution at any time. Other employees of the institution may request an inspection of specific facility via the "Employee Report of Unsafe Condition" Procedure.

Procedures

Resident departments will be notified in advance of annual Safety Committee building inspections and invited to have a departmental representative accompany the inspection team. The inspection team will have access to all areas of the inspected facility and resident departments will cooperate in facilitating this function.

After the physical inspection of the facility, the EHS Office will issue an inspection report to each of the resident departments and Plant Facilities listing problems, their location and a recommended corrective action.

Inspection report recipients will be given 30 days to respond to the report with a specific, written plan and timetable to resolve problems. The time period allowed to actually correct an item will depend on the seriousness of the problem and the complexity of the solution. If requested, the EHS Office will work with the department to help find a reasonable solution to the deficiency, but it is not the responsibility of the EH&S office to fund corrective action. If the Department Head or chief administrator object to an item in the inspection report they may state their objection in the written response and request a meeting to resolve the conflict.

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If a proper response to an annual inspection report is not received in 30 days the EHS Office may demand a meeting with the Department Head or Chief Administrator within 24 hours to 7 days, depending upon the seriousness of the problem, and notify the central administration. Continued lack of response may result in unilateral action to correct the problem by the EH&S Office.

If the corrective action listed in an inspection response is determined to be grossly inadequate by the EH&S Office, a meeting with the Department Head or Chief Administrator will be requested to resolve the problem. If this meeting cannot be arranged or fails to resolve the problem, the Director of EH&S will order a solution. The responding Dept. Head or Administrator must then either comply or obtain a written waiver from the central administration.

The EHS Office may conduct spot checks of specific facilities if it has reason to believe (including from an Employee Report of Unsafe Condition) that there is a significant and immediate risk to persons in the facility or danger of significant liability, as from potential environmental violations. In less urgent cases the department or office in control of the space where the potential problem exits will be notified and invited to accompany EHS personnel in the inspection at a mutually agreeable time within 7 days of notification.

If a problem is discovered during a spot inspection, the EHS office may require a meeting with the Dept. Head or Chief Administrator of the office in charge of the space within 24 hours to 7 days, depending on the severity of the problem. If this meeting fails to resolve the problem the subsequent procedure is the same as for a contested annual safety report.

Plant Facilities Responsibilities

The Plant Facilities Dept. is responsible to fund and initiate corrective action for safety inspection items that involve deficiencies in institution buildings that affect safe occupancy for the originally intended usage. Some examples would be: damaged wiring, damaged door closers on fire doors, inadequate or inappropriate fire extinguisher coverage (unless precipitated by a change in space usage), or exposed hot pipes from building systems.

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Departmental Responsibilities

Departments and Offices are responsible to fund and initiate corrective action for inspection report items relating to equipment they own, special requirements due to a change in the usage of space, damage to basic safety features of space due to unauthorized modifications or layout of laboratory apparatus. Some examples would be: portable vacuum pumps with unguarded belt drives, additional or specialized fire extinguishers needed due to creation of a lab in an old classroom, Holes cut in fire rated walls to accommodate unauthorized wiring, or installation of gas cylinder anchors.

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General Safety

As a unit of State government the institution is not under the jurisdiction of Federal OSHA (Occupational Health and Safety Act) regulations, however the institution recognizes the importance of OSHA standards and will make a reasonable effort to meet them. In general the institution will furnish to each of its employees "employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to its employees" (from Public Law 91-596 a.k.a. the General Duty Clause of the OSHA). The Environmental Health and Safety Office will be the authority within the institution to determine whether or not a specific OSHA standard can reasonably be attained in any specific situation.

Fall Protection

The institution will strive to make work environments comply with all provisions of 29 CFR, Sub-part E (Sections 1910.21 through 1910.32), "Walking and Working Surfaces".

Control of Hazardous Energy (a.k.a. "Lockout/Tagout")

The institution and will develop a program to meet the provisions of 29 CFR 1910.147 with regard to work environments containing sources of hazardous energy and endeavor to follow the standards contained in that regulation.

Machinery and Machine Guarding

Machinery owned by the institution should, when practical, meet the requirements of 29 CFR, Sub-part O (Sections 1910.301 through 1910.335),

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"Machinery and Machine Guarding," and 29 CFR, Sub-part P (Sections 1919.241 through 1910.247), "Hand and Portable Powered Tools and Other Hand-Held Equipment".

Welding, Cutting or Brazing

Welding done in facilities under the control of, or on property belonging to, the institution will, when reasonable to do so, conform with the provisions of 29 CFR, Sub-part Q (Sections 1910.251 through 1910.257), "Welding, Cutting and Brazing".

Ventilation

Work areas in facilities of the institution which may contain gases, fumes or fine particulates that may be hazardous to the health of employees should, if possible, be ventilated in compliance with regulations in 29 CFR 1910.94 ("Occupational Health and Environmental Control - Ventilation"). Solutions to specific ventilation problems should utilize information contained in the AGCIH Industrial Ventilation Manual, to the extent possible.

Personal Protective Equipment

Employees and students of the institution must utilize adequate personal protective equipment to prevent injury from hazards which can reasonably be expected to exist in their work place. They should comply with 29 CFR 1910, Sub-part I (Sections 1910.132 through 1910.140), "Personal Protective Equipment".

Supervisors will provide instruction to employees and students of the institution regarding what type of PPE is required and how to properly use it. If in doubt, they may consult with the EHS office, but they are responsible to provide the training.

Personal protective equipment (PPE) should only be used when engineering controls (shields, ventilation, etc.) cannot reasonably be utilized to protect the worker from probable hazards, or as a back-up to engineering controls.

Personal protective equipment needed to perform work tasks safely must be provided to the employees without cost to them.

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The EHS Department may recommend that the Administration take disciplinary action against employees or students of the Institution who willfully fail to use required PPE. Similar action may be recommended for supervisors who observe failure to use required PPE by employees or students and take no action to correct the situation.

Training

Operation of, and access to, "powered shop equipment," including woodworking equipment (saws, drills, routers, planers, sanders, etc.) and metal cutting, shaping or forming equipment (saws, lathes, mills, grinders, etc.) will only be allowed by persons with adequate instruction in the proper operation of that equipment and necessary safety procedures. Foundry facilities as well as cutting, brazing and welding equipment (gas or electric) and lasers will also be covered by this requirement. The department, or other unit, owning or in charge of the equipment, must designate a member of their staff to certify that operators of that equipment have received the required instruction prior to operating it. The certification of operators must be specific as to which equipment is covered; it must be in writing, signed by the designated/responsible staff member; and it must be available on request.

Individuals operating this equipment without proper training and certification will be subject to disciplinary action, as will persons who knowingly observe and allow use of the equipment by uncertified operators and take no action to prevent or at least report it to the responsible staff member.

The requirement for training and certification should be posted on the access door to the location where this equipment is kept or normally operated, along with the name of the staff member who must issue the required certification.

Part-time Student Employees

Part-time student employees are subject to all of the same requirements for industrial safety as are full-time employees. Some personal protective equipment provided to temporary or part-time employees may be of a non-fitted or adjustable variety when possible, but under no circumstances should limited employment status be used as justification for such employees to be denied free use of required PPE or to work without it.

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Each laboratory, shop or administrative office should be equipped with a first aid kit large enough to reasonably meet the needs of the number of people served by that facility, but not less than 10 persons. First aid kits should be well stocked with first aid supplies appropriate to the types of minor injuries that might normally be expected to occur in the facility they serve. They should be wall-mounted in a location that is clearly visible and easily accessible.

First aid kits may be located in hallways to serve several laboratories, shops or offices. If so, they must be of a size to reasonably meet the needs of the total number of persons served by those facilities, but not less than 20 persons. If located in hallways, they must be clearly visible from the entrances of all the rooms that they are intended to serve.

It is the responsibility of the department or office assigned the space to pay for and provide needed first aid kits. In addition, they must inspect these first aid kits at last semi-annually and replace missing or expired components. The use of commercial services to provide and maintain first aid kits is encouraged.

Section: **Environmental Health and Safety (EHS)** **Index: F-37**
Subject: **First Aid Training** **Page 1 of 1**

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The Environmental Health and Safety office will offer First Aid/CPR training to employees of the institution several times annually. The training will be given by Red Cross certified instructors. The EHS office will pay for the training, but there will be a cancellation fee, specified in advance, for registrants who do not attend with less than one week of advance notice. The cancellation fee is intended to minimize the loss of enrollment space and equipment rental due to frivolous, last minute cancellations. Funds collected will be used to offset the cost of equipment rental and instructor fees. To register for First Aid/CPR training an employee must submit a signed statement from their supervisor authorizing time away from regular duties to attend the class and agreeing to pay the cancellation fee from their departments funds if the employee is prevented from attending. The employees salary will be paid by their own department, not EHS, while they are away from their regular duties to take this training.

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Statement of Purpose

The EHS Department operates the Central Chemical Storage and Distribution Facility as a service to the entire institution to achieve to following goals:

* Prevent pollution through waste minimization by facilitating the recycling of obsolete and surplus chemicals.
* Institute economic incentives for prudent use of chemicals.
* Minimize the quantities of hazardous materials stored in occupied buildings by providing safe centralized storage of chemicals not in immediate use.
* Reduce chemical procurement costs through centralized chemical purchasing for the institution.
* Maintain an inventory of commonly used chemicals for prompt distribution.
* Receive, inspect and prepare all hazardous chemicals and radioactive materials before distribution to other campus locations.
* Maintain a computer database of chemicals on campus to provide:
  - Inventory available for teaching and research activities
  - Data for community right-to-know reports
  - Information about compliance with building and fire codes
* Provide health and safety information to end users of chemicals.

Procurement of Chemicals and Radioactive Materials

Chemicals and radioactive materials used by the institution are ordered, received and distributed by EHS through the CSDF. Requests for chemicals and radioactive materials are submitted to EHS using the Chemical Requisition Form or by email to chem@mines.colorado.edu. A requestor may

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specify any special requirements such as supplier, grade, mode of transportation, etc. Chemicals and radioactive materials are distributed from existing inventory whenever practical.Requestors are notified by phone of charges for and availability of materials.

Requests are honored only if the requestor has current EHS Hazardous Materials Management Training.

Distribution of Chemicals and Radioactive Materials

All hazardous chemicals and radioactive materials delivered to the institution are processed through the CSDF. EHS personnel inspect, unpackage, and label containers for distribution on campus. Pertinent information is stored in a computer database.

Upon receipt of chemicals and radioactive materials at the CSDF, requestors are notified and arrangements are made for pickup or delivery. EHS delivers orders which cannot be safely hand-carried to destinations (heavy or bulky loads, sensitive materials). Other orders may be delivered when trained EHS personnel are available.

Hazardous chemicals and radioactive materials are delivered to appropriate locations of use (laboratories, pilot plants, etc.) but not to departmental offices.

When chemicals or radioactive materials are distributed by EHS, the requestor or his/her representative signs an Acknowledgement of Receipt.

Exceptions --

Compressed gases in containers larger than lecture bottles may be ordered by and received by departments at the location of storage and use. Compressed gases are not to be delivered to Central Stores and Receiving.

Industrial chemicals such as fertilizer, pesticide, cleaning compound, maintenance chemicals may be purchased by Plant Facilities for delivery to Central Stores.

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Handling of Inventories of Chemicals and Radioactive Materials

The inventory of chemicals maintained at the CSDF is available to all CSM departments. "Ownership" of materials placed in the CSDF inventory is retained by the submitting department.. The EHS Department owns some materials at the CSDF and acts as steward of materials owned by other departments. At the time of distribution, ownership of a material is always transferred to the recipient department. Transfer of materials between departments is facilitated by the EHS department through Interdepartmental Sales/Service Voucher (ISSV). Only persons authorized by the buying and selling departments may sign such ISSV.

At the request of other departments, stocks of chemicals are moved by fully trained EHS personnel using appropriate vehicles. Upon receipt at the CSDF, each container is affixed with a unique bar code identification label. Pertinent data is recorded in a computer database. For CSM in general and for chemical users in particular, the benefits of such centralization include improved accessibility, reduced procurement costs, minimized waste generation, and safer storage.

The responsibility for proper handling, storage, disposal, employee training and protection rests with the department in physical possession of the chemicals and radioactive materials.

The EHS Department develops and maintains a computer database for control of chemical containers on the CSM campus. Each container presently in the system has information recorded for its name, grade, source, quantity, expiration date and location. Cross references are linked in to show PO numbers, acquisition dates, transfer, and parent/child relationships. Useful data retrieval keys, such as CAS numbers and chemical formulas, will be added in the future.

Data stored in the EHS database is available to all personnel who have established user accounts with the Computing Center. Assistance in using the chemical stores database is available from the CSDF or the Computing Center.

Health and Safety Information

The EHS Department procures and maintains health and safety information for the chemicals received for use at the institution. This information

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includes reference books, manuals, Material Safety Data Sheets (MSDSs), and CD-ROM databases. In addition, MSDSs are accessible on-line at all terminals on the campus computer system. Information and assistance is available from the EHS Department office.

Life Cycle Costing

To encourage waste minimization through financial incentives, the EHS Department will develop a program for which chemicals will be purchased at the cost likely to be incurred in that chemical's use. Life cycle costs will be determined from evaluation of procurement and disposal cost histories and forecasts. Upon implementation of the life cycle costing program, waste disposal will be a direct expense of the generating department, not an operating expense hidden as institutional overhead.

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Laboratory Right-to-Know Programs

Laboratory Right-to-Know programs are intended to conform with guidance in OSHA Regulation, 29 CFR 1910.1450. Also known as Chemical Hygiene Plans, Laboratory Right to Know Programs must be written and should contain, at a minimum, all components shown in Figure 20, a Model Chemical Hygiene Plan. Each regulated department is required to develop its own Chemical Hygiene Plan which is specific for that department's activities. The Environmental Health & Safety Department assists other CSM departments in the implementation and maintenance of their separate programs.

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Airborne asbestos contamination in buildings is a significant environmental problem. Various diseases have been linked with industrial exposure to airborne asbestos, and the extensive use of asbestos products in buildings has raised concerns about asbestos in non-industrial settings. Due to these concerns, the Environmental Protection Agency (EPA), the Occupational Health and Safety Administration (OSHA), and the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division have all promulgated regulations governing asbestos. The OSHA regulations pertain to worker protection in the work place. The EPA regulations are issued under the National Emissions Standard for Hazardous Air Pollutants (NESHAP). See the Air Emissions Section of this manual for further information on this topic. The CDPHE enforces the EPA regulations along with their own regulations. The CDPHE regulations are commonly referred to as Regulation 8. Regulation 8 can be found in Colorado Revised Statutes (C.R.S.) Title 25 Article 7 Part 5. CDPHE has the legal authority to enforce these regulations on the CSM campus.

Regulation 8 requires CSM to designate an Asbestos Coordinator/Program Manager. The Asbestos Coordinator/Program Manager (ACPM) is responsible for ensuring the requirements in Regulation 8 are properly implemented. The CSM Hazardous Materials Manager is the designated ACPM.

Asbestos operations fall into two main areas: Operations and Maintenance programs (O&M) and abatement operations. CSM has established an O&M program.

Operations and Maintenance Program

The purpose of the O&M program is to cleanup asbestos fibers previously released, prevent future releases of asbestos fibers by minimizing

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Asbestos-Containing Materials (ACM) disturbance or damage, and monitor the condition of ACM. Copies of the O&M program are maintained in the EHS office and the Plant Facilities office.

The ACPM is responsible for developing asbestos management plans and procedures. The Director of Plant Facilities and the Director of Student Life are responsible for insuring management plans and procedures being carried out by maintenance workers.

Abatement Operations

Asbestos abatement operations can be of two types: abatement operations performed by the CSM Asbestos Abatement Team and those performed by outside contractors.

Costs for emergency asbestos abatement that pose a public health risk and costs related to asbestos sampling not connected to remodeling will be borne by the EHS office. Costs for asbestos abatement that are related to normal maintenance operations will be borne by Plant Facilities. Costs for asbestos abatement and sampling related to remodeling will be borne by the entity funding the remodel.

CSM Asbestos Abatement Team

The CSM Asbestos Abatement Team will consist of the ACPM, an asbestos trained supervisor, and three asbestos workers. Plant Facilities workers will staff all positions but the ACPM. The EHS office will staff the ACPM position.

The CSM Asbestos Abatement Team will perform all asbestos abatement operations under the supervision of the ACPM. The CSM Asbestos Abatement Team will only perform jobs the ACPM has decided in-house resources/personnel can safely abate.

Costs of training and medical surveillance for asbestos works will be the responsibility of the EHS office. Costs of all asbestos abatement equipment, including personal protective equipment, will be the responsibility of Plant Facilities.

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Outside Contractors

All proposed asbestos abatement operations performed by outside contractors will be coordinated and approved by the ACPM before authorization is given to commence work.

Remodeling

Prior to conducting a remodel in a public access area or a controlled maintenance project, that would involve the removal of more than 50 linear feet of asbestos on pipes, 32 square feet of asbestos on other surfaces, or the volume equivalent of a 55-gallon drum of asbestos, an asbestos inspection will be performed. The asbestos inspection will fulfill all of the criteria in Section V.C.- V.F of Regulation 8. The entity funding the remodel project will be responsible for providing the funding for this inspection. If it is a controlled maintenance project, Plant Facilities will fund the inspection.

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Storage tanks are divided into three groups: Aboveground Storage Tanks (AST), Underground Storage Tanks (UST), and Hazardous Waste Storage Tanks (HWST). Both ASTs and USTs are regulated by the Colorado Department of Labor and Employment (DOL), State Inspector of Oils. HWSTs are regulated by the Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division. Both CDPHE and DOL have the legal authority to enforce these regulations on the CSM campus.

It is the policy of the Colorado School of Mines to remove existing USTs and replace them with ASTs whenever possible.

Underground Storage Tanks (UST)

UST is defined as one or any combination of tanks that: (1) are used to contain an accumulation of "regulated substances" and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are tanks storing (1) gasoline, used oil, diesel fuel and (2) industrial solvents, pesticides, herbicides, fumigants. Regulations governing USTs can be found in Colorado Revised Statute Title 8 Article 20 Parts 5. All regulated UST's on the CSM campus have been removed. The only underground tanks remaining on the CSM campus are two heating oil tanks located east of the Prospector Village boiler house. These tanks are scheduled for removal.

Aboveground Storage Tank (AST)

AST is defined as one or a combination of tanks that: (1) are used to contain an accumulation of petroleum and (2) whose volume (including underground piping) is 90% or more above the ground. Regulations

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governing ASTs can be found in Colorado Revised Statute Title 8 Article 20 Parts 7. There are three AST's at CSM. A 2000 gallon unleaded gasoline AST and a 1000 gallon diesel AST are located at the Plant Facilities Truck Shop. There is also a 500 gallon diesel AST located at the Experimental Mine in Idaho Springs, Colorado.

Hazardous Waste Storage Tank (HWST)

A hazardous waste storage tank is defined as a tank that is used for storage of any material that is listed as a hazardous waste in Colorado Revised Statute Title 25 Article 15 Part 261. These tanks must conform to all requirements specified in Colorado Revised Statute Title 25 Article 15 Parts 265.190-265.201. CSM does not have any HWST.

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Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

General:

Lead is a highly toxic metal which in the past was a common ingredient in paint and solder. Respiratory exposure to airborne lead particulate or vapor is hazardous. Ingestion of lead is also hazardous.

Lead paint is commonly found in older buildings and in areas where exposure to weather is anticipated (windows, doors, etc.). Lead paint may also be used as primer on metal (red lead) and as an ingredient in plumbing and electrical solder.

Creation of lead particulate by sandblasting, chipping or sanding; or creation of lead vapor by heating (welding of lead-primed metal; heating of solder) is potentially hazardous to the health of Plant Facilities' workers and building occupants. Children are especially vulnerable to effects of lead exposure. Proper handling of lead hazards in family housing units is important.

If building occupants or maintenance workers have concerns about lead content in materials they use, in building spaces they occupy, or in areas that are to be remodeled, they should contact the Environmental Health and Safety office (EHS) at 273-3316.

Training:

Painters, carpenters, plumbers, all maintenance foremen and supervisors must attend at least one lead safety training session. This training will be offered on an annual basis by the EHS office. Supervisors should ensure that new hires are directed to receive this training. Attendance at one training session is required for the aforementioned workers.

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Planning and Recognition:

Maintenance personnel should remain alert to the potential for lead hazards which may be associated with certain maintenance and construction projects. It is important to recognize potential lead hazards before a project commences. If potential lead hazards are anticipated, EHS should be immediately informed. Management personnel should then consult with the EHS office before authorizing commencement of the work. The EHS office will evaluate the situation and will obtain samples of suspect lead-containing material for analysis. If lead is detected, the EHS office will prescribe protective measures and lead abatement procedures. Circumstances which warrant delay of work, consultation with the EHS office, and sampling and analysis for lead include:

1. Sanding, heating, cutting or welding of painted metal surfaces, particularly if installations are old and show evidence of a red primer coat.

2. Heating/melting of solder in old electrical or plumbing installations.

3. Chipping, sandblasting or sanding of painted surfaces in older buildings, particularly surfaces which are exposed to weather (windows, doors, exteriors).

4. Chipping, sanding, welding, sandblasting in family housing units.

Cost:

The EHS office will bear costs associated with worker training and costs related to sampling and analysis of suspected lead-containing materials which are accomplished on a routine turn-around schedule by the analytical lab. Costs for rush analyses will be paid by the organization that is responsible for initiating/accomplishing the project. If the EHS office decides that in-house resources/personnel can be utilized to safely abate a lead hazard, cost will be allocated as follows:

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Sampling	EHS
Analysis	EHS
Training	EHS
Lead Waste Packaging/Disposal . .	EHS
Respirators	Plant/Housing
Cartridges	Plant/Housing
HEPA Vacuum	Plant/Housing
Protective Suits	Plant/Housing

If in-house resources are insufficient to abate a lead hazard, outside consulting/abatement firms may be called in to handle the work. If outside firms are used, costs for contractor services for lead abatement should be paid by the organization that initiates the project. If emergency response to a lead hazard is prompted by failure to recognize a potential hazard, the organization that caused the release or exposure to lead is responsible to pay for remedial action. Such costs may include: costs for medical exams; costs for disposal of contaminated construction material, soil, water, etc.; costs for abatement contractor services; costs for services of consulting industrial hygienists; costs for environmental sampling and analysis.

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There are three main agencies responsible for publishing exposure standards for employee and public exposure to hazardous materials and physical agents. Two of these agencies are responsible for publishing exposure limits for the work place. These agencies are the America Conference of Governmental and Industrial Hygienists (ACGIH) and the National Institute of Occupational Safety and Health (NIOSH), Public Health Service, Department of Health, Education, and Welfare. The agency responsible for publishing public exposure standards is the Environmental Protection Agency (EPA). The Colorado Department of Public Health and Environment (CDPHE) and the EPA has the legal authority to enforce EPA regulations on the CSM campus.

The Colorado School of Mines also follows the published guidelines of ACGIH and NIOSH in determining safe exposures to the public and its employees.

To meet these guidelines the Environmental Health and Safety office provides industrial hygiene and health physics services in five areas. These areas are:

Health Hazard Recognition - Walk-through surveys, chemical inventory reviews, and process and equipment reviews are all used to identify exposures to potential health hazards. Hazard recognition is provided for:

* Solvents
* Particulates
* Biological Hazards
* Noise
* Nonionizing Radiation
* Dermatoses

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* Temperature Stressors
* Illumination
* Ionizing Radiation
* Personal Protective Equipment
* Ventilation
* Ergonomics
* Vibration

Health Hazard Evaluation - Evaluation is the process where a professional opinion is given as to the degree of risk present. Services available for evaluation are:

* Toxicology
* Industrial Hygiene Evaluation
* Air-Sampling
* Wipe-Sampling
* Direct-Reading Gas and Vapor Monitors
* Radiation Surveys

Health Hazard Control - When a health stressor is judged to pose a health hazard, control measures are instituted. These control measures can include recommendations for chemical or machine substitution, design and recommendations for engineering and/or administrative controls in proposed or existing systems, medical surveillance programs and establishment of personal protective equipment programs.

Education and Training - Education and training includes orientation, periodic information and training sessions, written safety and health guidelines, posting of dangerous areas, and chemical labeling. If training and education are needed, the following services are provided:

* Identifying training needs
* Identifying goals and objectives
* Conducting the training

Follow-up Services - Follow-up services consist of the following items:

* Evaluating program effectiveness
* Improving the program

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Employee Right-to-Know (RTK) Programs

Employee Right-to-Know Programs are intended to conform with guidance in OSHA Regulation, 29 CFR 1910.1200. Also known as Hazard Communication Programs, RTK programs must be written and should contain, at a minimum, all components shown in Figure 21, a Model Hazard Communication Program. Each regulated department is required to develop its own RTK program which is specific for that department's activities.

The Environmental Health & Safety Department assists other CSM departments in the implementation and maintenance of their separate RTK programs. EHS provides general training sessions to complement the more specific instruction provided by other departments. An outline of the general training provided by EHS is supplied in Figure 22.

The EHS Department procures and maintains health and safety information for the chemicals received for use at the institution. This information includes reference books, manuals and Material Safety Data Sheets (MSDSs). EHS makes MSDSs available to all CSM employees in three ways:

A. A set of binders contains an alphabetical listing of MSDSs for each chemical which is purchased by CSM personnel. These binders are maintained in the EHS office. Whenever the EHS office receives an MSDS for a recent chemical purchase, the MSDS is forwarded to the procurer along with the transmittal memo depicted in Figure 23.

B. The EHS office subscribes to a CD-ROM update service which provides easy computer access to a large integrated database concerning the hazardous properties of a large number of chemicals.

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C. The Central Chemical Storage and Distribution Facility has set up an on-line system for accessing a large MSDS database at the University of Utah. Internet is used to link any computer on the campus system to the MSDS database.

Figure 21

COLORADO SCHOOL OF MINES

Model Employee Hazard Communication Program

Last Revision: _____

A. General: This Hazard Communication Program (Employee Right-to-Know) is intended to conform with guidance in OSHA Regulations, 29 CFR Part 1910.1200. This program applies to employees of the _____ Department of Colorado School of Mines.

B. Responsibilities: The following responsibilities for Hazard Communication refer to activities within the _____ Department.

1. Department Director

   - Directs the Hazard Communication Program, delegating tasks to other Department employees, as appropriate.

2. All Employees of the Department

   - Conform with precautions enumerated during training; on MSDSs; or on container labels.
   - Utilize personal protective equipment as instructed.
   - Read and heed MSDSs and warning labels.
   - Report introduction of new chemicals to supervisor.

C. Program Elements

- Maintain and implement a written hazard communication plan.
- Maintain organizational compliance with written program.
- Provide suitable training to EHS personnel at time of assignment or whenever new chemicals are introduced.
- Maintain current inventories of chemicals in the work places under control of EHS.
- Obtain and make available MSDSs at a central work place location for each chemical in the work place.
- Ensure labels are affixed to each chemical container as required.

D. Effective Date: This program is in effect as of _____ .

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E. Chemical Inventory: The _____ Department maintains a current inventory of all chemicals in the work places under its control, to include all offices, laboratories, storage facilities.

F. MSDS: The _____ Department obtains and catalogs MSDSs for chemicals in use in the work place. These are available to all employees of the _____ Department.

G. Labeling: Each container of a chemical in the work place is labeled with the following information: a) identity of the chemical; b) appropriate hazard warnings; c) name and address of manufacturer/distributor. If a container is not already labeled with this information, the supervisor ensures that a label is prepared and affixed to the container which conveys the information.

H. Training: EHS personnel provide Right-To-Know training sessions for Classified CSM Staff employees on a annual basis. All employees attend at least one of these sessions. All employees receive training for specific chemicals in the work place at the time of assignment and whenever new chemicals are introduced.

I. Exceptions: Consumer products which are used with a frequency and in quantities as might be used in a "household" are not included in this program. Chemicals which are transferred to secondary containers and are intended for immediate use by the worker who makes the transfer need not be labeled. Stationary process containers (reactors, tanks, ball mills, etc.) do not require labeling.

J. Availability: Copies of this written program are available to any _____ Department employee upon request.

3/3/95-Bobrept/Rept45-A

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Figure 22

HAZARD COMMUNICATION PROGRAM

Employee Right-to-Know Training Outline

I. Introduction -- What is Employee Right-to-Know? Why is it needed?

II. Toxicology

"What Everyone Should Know About Toxicology" video

Discussion of terms

III. Chemical Hazards in the Work Place -- General Awareness

Some specific hazards on CSM campus

Warning indicators of presence or release

Associated physical and health hazards

Protective actions

IV. Labeling Requirements

A. Systems commonly used

B. Proper work practices for labeling

V. Material Safety Data Sheets (MSDSs)

"Cornerstone of Chemical Safety" video

Components of the MSDS

Availability - EHS office, work area, computer database

Limitations - examples of good ones and bad ones

VI. Hazard Communication Program(s) at CSM

Applicability, elements, responsibilities, availability

VII. Questions and Answers

3/3/95-Bobrept/Rept45-B

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NOTICE TO CHEMICAL PURCHASER

"Chemical Safety Information"

The enclosed material Safety Data Sheet (MSDS) is forwarded to accompany your recent purchase of a chemical. Please ensure that all persons who may come in contact with this material are aware of the information in the MSDS. The EHS Office maintains an extensive library of chemical hazard reference books and a large collection of MSDSs. Call the EHS Office at 273-3316 if you require additional information concerning chemical hazards in your work place.

Employee and community "right-to-know" laws now require many employers and educational institutions to implement comprehensive chemical hazard awareness programs. In addition, we have a moral responsibility to ensure that employees, students, and the community are aware of the nature of the chemicals used on our campus. For these reasons, I strongly encourage work place supervisors (especially supervisors of research and teaching laboratories) to accomplish the following:

a. Maintain an accurate inventory of chemicals.

b. Maintain a complete and easily accessible file of MSDSs for each chemical (preferably on a wall mounted clipboard located just outside the entrance to the room or area).

c. Institute a training program to ensure that employees and students are familiar with the hazardous properties of chemicals in the area.

On a related matter, please bear in mind that as a purchaser of a chemical, you have automatically assumed responsibility for ensuring that the material is properly managed in the laboratory/ work area, and is eventually subject to proper disposal via the School's Hazardous Waste Management Program. The right to purchase chemicals is accompanied by the individual's responsibility to initiate proper and timely disposal. Call the EHS Office if you have questions, or need assistance in disposing of chemical waste.

Thanks for your help.

Bob MacPherson, Director
Environmental Health and Safety
Chauvenet Hall, Room 141

Enclosure

8/11/93-kempurch-DOC

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Respiratory Protection Programs

Respiratory protection programs are intended to conform with guidance in OSHA Regulation, 29 CFR Part 1910.134. Respiratory protection programs must be written and should contain, at a minimum, all components shown in Figure 24, a Model Respiratory Protection Program for adaptation by regulated departments. Each regulated department is required to develop its own respiratory protection program which is specific for that department's activities. The Environmental Health & Safety Department assists other CSM departments in the implementation and maintenance of their separate respiratory protection programs.

Figure 24

COLORADO SCHOOL OF MINES

▶▶ MODEL RESPIRATORY PROTECTION PROGRAM ◀◀

Last Revision: _____

This Respiratory Protection Program is intended to conform with guidance in OSHA Regulation, 29 CFR Part 1910.134. This plan applies to employees of the _____ Department of Colorado School of Mines.

A. General Principles

In addition to the more detailed components of the program listed below, the following are guiding general principles:

1. Prevention of air contamination shall be the primary control of occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors.
2. As far as feasible, engineering control measures will be used to control contamination of breathing air.
3. When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators may be used.
4. Appropriate respirators may be used in emergency situations or in conditions of unknown air contamination or unknown oxygen concentration.

B. Responsibilities

The following responsibilities for the Respiratory Protection Program refer to activities within the _____ Department.

1. Department Director

   Has ultimate responsibility for respiratory protection of employees within the Department.

2. Primary Investigator/Lab Supervisor

   Works with Director and other employees to develop and implement appropriate respirator program policies and practices.

   Trains and monitors employees in the selection, use, cleaning, maintenance and storage of respirators

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Possesses the technical and professional background needed to make sound decisions based on an evaluation and understanding of work place hazards.

3. All Other Personnel

Use the provided respiratory protection in accordance with the instructions and training of the Department's Respiratory Protection Program

C. Elements of the Respiratory Protection Program

Respirator Selection - Proper selection of respirators is made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969. Selection of the appropriate respirator is made by the Primary Investigator/Lab Supervisor after identification and evaluation of hazards or potential hazards.

Instruction and Training - Employees are trained by the Primary Investigator/Lab Supervisor prior to work in any contaminated or potentially contaminated work area. Such training consists or proper selection, use, fit-testing, cleaning and maintenance of respirators.

Fit-Testing - Prior to respirator use in actual work conditions, each respirator wearer is fit-tested using a qualitative method. In addition, each wearer is to fit-test the respirator at the beginning of each use using positive and negative tests.

Respirator Cleaning, Disinfection, and Storage - Respirators are cleaned and disinfected after each. After drying, respirators are placed in clean plastic bags for storage in the _____.

Inspection and Maintenance - Respirators are inspected prior to each use and when cleaned. Defective parts are repaired or replaced before respirators are used. Self-contained breathing apparatus units are inspected monthly using the manufacturer's suggested procedures.

Surveillance - The Primary Investigator/Lab Supervisor conducts frequent surveillance of work area conditions and degree of employee exposure. The Primary Investigator/Lab Supervisor also ensures that respirators are properly selected, used, cleaned and maintained.

Evaluation of the Program - The Primary Investigator/Lab Supervisor evaluates the effectiveness of this program on an annual basis.

Medical opinion - A physician's written opinion is obtained for each affected employee regarding the ability to wear respiratory protection and to perform related work.

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D. Standard Procedures

The correct respirator is specified by the Primary Investigator/Lab Supervisor for each type of job. In conditions of unknown concentration of air contaminants, unknown oxygen concentration or situations that are Immediately Dangerous to Life or Health, self-contained breathing apparatus units are required.

The manufacturer's instructions for selection, use and fit-testing are used as standard operating procedures for each type of respirator.

In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional person with appropriate respiratory protection is to be present. Communications are maintained between all individuals present.

Respirator wearers are not allowed to have excessive facial hair nor temple pieces on glasses.

Compressed air in self-contained breathing apparatus units is of high purity and meets or exceeds the specification for Grade D breathing air (Compressed Gas Association Commodity Specification G-7.1-1966). Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations or the Department of Transportation. Marking of breathing gas containers is in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954.

E. Effective Date

This plan is effective _____.

F. Availability

The following information is available to any Department employee upon request:

Copy of this written Respiratory Protection Program.

Copy of OSHA regulation 29CFR1910.134 and other regulations for specific hazards.

Other reference materials on the hazards, safe handling, storage and disposal of hazardous chemicals.

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Safety Systems Maintenance

In general, safety systems at all facilities under the control of the institution will be properly maintained in good working condition and in compliance with relevant NFPA (National Fire Protection Association), UFC (Uniform Fire Code), UBC (Uniform Building Code), NEC (National Electrical Code), UMC (Uniform Mechanical Code), and OSHA (Occupational Health and Safety Act) standards. Some specific standards which apply are as follows:

1. Sprinkler Systems - NFPA (National Fire Protection Assoc.) 13 and 13A
2. Standpipes - NFPA 1962, 14 and 13A
3. Alarm Systems - NFPA 72A and 72E
4. Battery Pack Powered Emergency Lighting - NFPA 70 and 101
5. Emergency Generators - NFPA 70 and 101
6. Dry Chemical Fire Suppression Systems - NFPA 17
7. Halon Fire Suppression Systems - NFPA 12A and 12B
8. Fume Hoods - NFPA 45
9. Ventilation Hoods, Electrostatic Precipitators and Dust Collection Systems - AGCIH (Amer. Congress of Governmental Industrial Hygienists) Recommended Practices for Industrial Ventilation.

Some specific tasks which must be performed to comply with these standards are as follows:

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SAFETY SYSTEMS MAINTENANCE CHECK DESCRIPTION

Systems	Subsystem	Frequency	Description
Sprinklers		Quarterly	A. Inspect F.D. connections. Ensure signs and caps are in place and that connections are not obscured by vegetation. B. Ensure that all supply control valves (including post indicator valves, valves in roadway boxes, valves on risers, main supply valves etc.) are secured in the open position by means of a seal, lock, or tamper switch. Test tamper switches. Lubricate valves as required. C. Flow test through main drain. D. Test water flow alarms. For wet systems, trip alarm valve by flowing water through inspectors test drain. E. Inspect and compare air and water pressure readings (dry systems). F. Inspect sprinkler valve spatial enclosures. Ensure heating systems are functional to prevent freezing. G. Inspect priming water level (dry systems). H. Maintain required records; administer the impairment tag system; fill out and attach record tag to each supply control valve.
Sprinklers		Annual	A. Trip test with supply control valve partially open. Clean, repair, reset valve. Fill out and attach record tag. B. Open low point drains on dry system to drain condensation.
Sprinklers	Quick Opening Devices	Semi-Annual	Test and reset quick opening devices according to manufacturers instruction.

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Systems	Subsystem	Frequency	Description
Sprinklers		3 Years	Full-flow test of dry pipe valve. Supply control valve full open; test flow through inspectors test drain.
Sprinklers	Piping	5 Years	Accomplish internal examination of piping for obstructions.
Sprinklers	Gauges	5 Years	Calibrate pressure gauges.
Sprinklers	Boost Pumps	Monthly	Test operate fire sprinkler boost pumps.
Sprinklers	Boost Pumps	Annual	Accomplish flow test of pump. Confirm proper discharge flow rate and pressure.
Standpipes		Annual	Visually inspect all portions of stand pipes including F.D. connections. Ensure that caps and signs are installed on F.D. connections and that all connections are unobstructed and capped. Install seals or locks on supply control valves. Ensure that all valves are in the normal ready position. Lubricate valves. Maintain records and impairment tag system.
Standpipes	Dry System Piping	5 Years	Accomplish hydrotesting of piping.
Standpipes	Hoses	Annual	Inspect hose installations to ensure hoses are in proper position; valves are in position and lubricated; water is available. Inspect hose for damage, vandalism, mildew, etc. Remove hose and rerack as per 1962 2-3.2. Maintain inspection records.
Standpipes	Hoses	5, 8, or 2 Years	Accomplish service testing/hydrotesting of hoses. Hoses should be hydrotested at intervals of 2 years if hoses are older than 8 years. (Hoses should be hydrotested at intervals of 5 and 8 years following initial installation.) Maintain test records.

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Systems	Subsystem	Frequency	Description
Alarm Systems	Alarm Detectors and Associated Circuitry and Devices	Semi-Annual	A. Inspect and test alarm system operation. Include operational tests of components/systems as follows: 1. Pull stations. 2. Horns. 3. Central monitoring station notification (if provided). 4. Smoke and heat detectors including duct-mounted smoke detectors. 5. Tamper switches. 6. Flow switches. 7. Battery back up. 8. Indicator lights and annunciator zones. 9. Automatic HVAC shutdown (if provided). 10. Automatic rollup-down doors (if provided). 11. Automatic magnetic firedoors and emergency unlocking devices (if provided). B. Confirm proper operation of elevator service features (if provided). C. Clean, test and inspect smoke detectors. Test a representative sample of detectors using a smoke source or built-in test feature. Replace batteries in battery-operated detectors. Ensure continuity with and activation of alarm system. Ensure HVAC system shutdown is initiated by duct-mounted detectors. D. Inspect, clean and test heat detectors. Test a representative sample of detectors in place using a heat source. Ensure continuity with and activation of alarm system. E. Confirm proper operation of sprinkler system flow and tamper switches. Confirm sprinkler flow activation of alarm system and accurate annunciation.

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Systems	Subsystem	Frequency	Description
Alarm Systems	Exit Door Alarms	Annual	Inspect/test exit door alarms. Repair/replace components (batteries) as required.
Emergency Electric Power	Battery Pack Emergency Lights	Annual	Inspect, test, repair, replace.
Emergency Electric Lights	Emergency Generator	Quarterly	Test operate generator under no load condition. Check battery levels, fuel, oil, coolant, etc.
Emergency Electric Power	Emergency Generator	Annual	Test operate generator under load condition by simulating normal power failure. Observe operation of emergency-starting circuits and distribution system. Inspect emergency lights for proper operation. Replace lamps as required. Confirm proper operation of other emergency circuits including elevators, alarm systems, HVAC systems, etc.
Fire Suppression Systems	Dry Chemical		Monitor contractor performance of checks and compliance with maintenance contract specifications.
Fire Suppression Systems	Halon		Monitor contractor performance of checks and compliance with maintenance contract specifications.
Illuminated Exit and Directional Signs		Annual	Inspect, test and repair signs. Ensure emergency power sources are operational.
Local Exhaust Systems	Fume Hoods	Annual	Conduct inspection of fume hoods. Check face velocity. Affix an inspection tag. Affix an indicator tag showing sash position to achieve 100 F.P.M. face velocity. Inspect air supply and exhaust fans, motors and components. Examine duct work. Observe if air path in hood is obstructed by equipment storage, etc. Check position of baffles. Record results of inspection. Submit records to Safety Officer for review. (If hood is equipped with a water washdown system, test operate the washdown system.)

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Systems	Subsystem	Frequency	Description
Local Exhaust Systems	Misc. Vent. Hoods/Electrostatic Precipitators/Dust Collection Systems	Annual	Check velocity of hoods. Observe that hoods/systems are operational. Check to see if precipitators/filters are clean.
Lab Safety	Deluge Showers and Eyewashes	Annual	Test flow through showers and eyewashes. Lubricate valves.
Lab Safety	Emergency Electrical Shutdown	Annual	Test operate emergency electrical shutdown alarms in labs.
General Building Mechanical		Annual	Ensure that inspection certificates are current.

It is the responsibility of the Plant facilities Department to complete required inspections of all safety systems, to perform or arrange for required maintenance, and to maintain good records of these functions in accordance with the above standards. These records will be supplied to the Environmental Health and Safety (EHS) office as requested. EHS will review Plant Facilities Records of Safety Systems inspection and maintenance and perform spot checks that are deemed necessary to assure compliance with the above Standards.

It is the responsibility of Plant Facilities to fund the cost of safety systems inspection and maintenance with the following exceptions:

1. The Student Life Office will fund the cost of safety systems inspection and maintenance in facilities under their jurisdiction, although the responsibility for providing these services remains with the Plant Facilities Dept.

2. The Computing Center and EHS Office will fund and arrange for required inspections and maintenance for Halon and dry chemical fire suppression systems in their respective facilities.

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3. Certain aspects of fire extinguisher inspection and testing (as specified below under "Portable Fire Extinguishers" will be the responsibility of and funded by the EHS Office. All other requirements for portable fire extinguishers will be the responsibility of the Plant Facilities Department or the Department assigned the space in question.

Portable Fire Extinguishers

Adequately sized and appropriately rated portable fire extinguishers will be provided, inspected and maintained for all facilities under the control of the institution in accordance with standards in NFPA 10.

The Plant Facilities Department is responsible provide the basic portable fire extinguisher coverage detailed in the above standard based on the existing usage of the facility. In addition, Plant Facilities personnel will perform required, monthly, visual inspection of all fire extinguishers in institution facilities and present faulty units to EHS for repair or replacement.

The EHS Office will fund and initiate annual inspections and multi-year testing required for portable fire extinguishers by the above standard. In addition EHS will repair or replace faulty extinguishers presented to them by plant facilities personnel, having discovered them on monthly inspections. The Plant Facilities Dept., not EHS, will fund and initiate replacement of missing extinguishers or extinguishers identified as being of an inappropriate size or type by safety inspections (unless due to a change of space usage by a resident department).

Resident Departments will obtain and pay for additional or differently rated portable fire extinguishers made necessary by a change of usage of space they occupy.

Flammable Liquid Storage Cabinets

Storage of flammable and combustible liquids in any room of a facility controlled by the institution will conform to UFC and NFPA standards. Specifically, a total of no more than 10 gals will be kept in a room not meeting appropriate UBC Class H Occupancy Standards unless it is kept a flammable liquids storage cabinet as defined by the NFPA. Also, individual containers, 5 gal. or larger (whether full or not) must be kept in a flammable liquids cabinet. As with other hazardous materials, the quantities

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of flammable and combustible liquids stored in facilities of the institution must be kept to the **absolute minimum** required for immediate (a week or less) operations. Excess quantities of these substances must be stored in the CSDF (Chemical Storage and Distribution Facility) or ICSF (Industrial Chemical Storage Facility) operated by the EH&S Office.

Fires

The primary purpose for portable fire extinguishers and standpipe hoses is to facilitate building evacuation by giving persons who might be trapped a means to knock down flames long enough to escape. Individuals are **not** to attempt to fight fires with portable extinguishers or hoses unless the fire is small, not spreading rapidly, they know how to use the equipment and believe they have a good chance of putting out the flames in **less than one minute** (including the time to get the extinguisher or hose). Under no circumstances should a person attempt to get a 2nd extinguisher to continue battling flames if the first one did not put out the fire.

If a person present at the scene of a fire does not feel they have a reasonable chance of quickly putting out flames with available fire suppression equipment or they do not know how to use it, they should immediately trip a fire alarm pull station and then call 911 from another building, giving the dispatcher as much information as possible about the exact location and nature of the fire, as well as other information (special hazards etc.) that might be important to responding fire crews. If two or more persons are present at the scene of a fire, one should always to trip a fire alarm pull station while others, if appropriate, attempt to extinguish the flames.

Fire Alarm Response

All persons in buildings under the control of the institution will follow the Fire Alarm/Fire Drill Procedures (Figure 25) whenever a fire alarm sounds, regardless of whether or not it is a drill. These procedures, will be distributed by EHS to all administrative offices within the institution annually. They should be copied and distributed to all persons regularly occupying space under the control of those offices, who should familiarize themselves with the procedures. Copies should also be posted in classrooms, corridors and lounge areas where visitors, such as students attending classes, will see them. Faculty should briefly summarize these procedures to students during the first session of any regular class and point out where

they are posted. In the event of an alarm, faculty and staff who are resident to a building should act as wardens to direct others who may be less familiar with the proper course of action.

The EHS Department may recommend that the Administration take disciplinary action against staff or students who willfully ignore Fire Alarm/Fire Drill Procedures when an alarm sounds.

Residence halls have their own, more detailed alarm response procedures which apply, above and beyond this generic plan.

Fire Alarm Monitoring

Building fire alarm systems will be continuously monitored in accordance with standards contained in NFPA 72. The cost of this service will be provided and funded by the Plant Facilities Department.

The alarm monitor will immediately notify the local Fire Department dispatcher when an alarm is received according to instructions provided by the Plant Facilities Department. The Alarm monitor will also immediately report system trouble signals according to instructions received from Plant Facilities. In the event of a system trouble signal, Plant Facilities will respond, or obtain an appropriate, commercial response to restore the alarm system to operation in a minimum possible amount of time. If a trouble signal is reported outside of business hours, when Plant Facilities electricians are not on duty, the Public Safety Officer on duty, when notified, will initially attempt to restore the system to operation. If the Officer is unable to easily restore the system or is unable to respond to the problem due to other duties, he will summon a commercial service to restore the system as pre-arranged by Plant Facilities. Plant Facilities is responsible to arrange for and fund this after-hours back-up and to give Public Safety information necessary to summon it.

Fire Drills

Fire Drills of all the institutions alarmed buildings will be conducted at least twice annually and twice per semester in residence halls, although verified adequate response to unscheduled alarms may be substituted for a fire drill if judged equivalent by the EHS office.

The EHS office will schedule fire drills, coordinate necessary notifications, arrange for personnel to conduct the drills and keep a record of them.

The Plant Facilities Department will, with reasonable notice, provide an electrician to reset the alarm and check the function of horns, strobes, door closers, etc.

The Department of Public Safety will, with reasonable notice, provide an officer to assist in sweeping the building for persons not responding to the alarm.

If, in the judgment of the EHS Office, the response to a fire drill is inadequate, due to incomplete or slow evacuation, unauthorized re-entry, inadequate evacuation distance or for some other reason, additional fire drills may be held in the same building until an acceptable response is achieved.

A reasonable effort will be made to avoid conflict with critical functions (exams, laboratory procedures, important meetings, etc., but not regular classes) by consulting with Department Offices and providing limited notification, but if repeat fire drills are required, no such consultation or notification will occur.

Fire Inspections

Inspections for fire prevention will be conducted annually as part of the regular Safety Committee building inspection process. Violations of the UFC, or the Life Safety Code, as well as other items believed to constitute a fire danger by members of the Safety Committee inspection team will be included in the inspection report, to be corrected. Copies of annual building inspection reports will be sent to the Fire Marshal in accordance with the agreement between the Fire Department and the institution whereby the Fire Marshal waives inspection of the institution's facilities. Inspections of sleeping rooms in Residence Halls will be conducted at least once per semester by Residence Life Staff. Basic Fire/Life Safety Standards (Figure 26) will be enforced by those inspections.

Life Safety

All buildings under the control of the institution will comply with the Life Safety Code. Specific "Residence Hall Life Safety and Fire Survival

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Procedures" (Figure 27) will be enforced by the Residence Life Staff, and a copy of these procedures will be posted in each sleeping room.

Fire Department Liaison

The EHS Office will act as the institutions liaison with the Golden Fire Department and will provide information required by the Fire Marshal.

Figure 25

COLORADO SCHOOL OF MINES
Environmental Health and Safety (EHS)
FIRE ALARM/DRILL PROCEDURES

If a fire alarm sounds (drill or not) these procedures should be followed:

1. Evacuate the building immediately via the nearest unobstructed exit. As you leave:

   - Close all doors and windows.

   - Students in classes should take coats and personal belongings with them unless doing so will delay departure.

   - Turn off any equipment that may pose a danger if left unattended for an extended period.

   - Do not use elevators (even for evacuation of mobility impaired persons).

   - If you encounter other persons, on your way out of the building, who do not appear to be evacuating (for whatever reason) tell them that there is a fire alarm and that they are **required by law** to leave the building immediately.

   - If you are aware of another person working in an area where the alarm might be difficult to hear or recognize (due to equipment noise, remote location, hearing impairment of the individual, etc.), warn them of the alarm on your way out.

   - If you encounter a person with mobility impairment while leaving the building, assist them in getting to a "place of refuge" (a stairwell in most buildings).

2. As you exit the building:

   - **Move well away from the building** (to the opposite side of the street - 75 ft or more away from the building). Do not congregate at the building entrance. If the weather is inclement, wait inside adjacent buildings. Do not re-enter the building when the alarm is silenced unless approval is given by officials present.

   - If you have important information (the location or nature of the fire, the location of trapped or mobility impaired persons, or potential dangers to emergency crews entering the immediate area of the fire), present yourself to responding police or firemen as soon as they arrive and advise them.

   - If there are obvious signs of fire (smoke, flames, etc.), call 911 with the information even though the alarm is already sounding.

2/28/95-Bobrept/Rept47A

Figure 26

RESIDENCE HALL
FIRE/LIFE SAFETY STANDARDS

Student occupants of residence halls are responsible to conform to the following life safety standards. These standards are maintained through a program of inspection and enforcement. Questions concerning the life safety code may be addressed to the EHS Office.

A. All extension cords must be constructed with a minimum of 16 gauge wire (gauge numbers vary inversely with capacity). Extension cords used in buildings with grounded electrical systems must be 3 wire/3 prong type. Cords must be well maintained with no breaks in insulation.

B. Light construction multiple outlet devices (cube taps) which plug directly into outlets are not authorized. Heavy duty multiple outlet devices which are equipped with internal breaker protection and 16 gauge wire are authorized. Authorized extension cords may be equipped with multiple outlets so long as the outlet fitting is a single piece fused rubber type which is an integral component of the extension cord. Multiple outlet devices intended for use in buildings with grounded electrical systems must be equipped with 3 wire/3 prong ground protection.

C. Not more than one high wattage appliance such as a hair dryer, heater, water warmer, etc. may be connected to a single wall outlet at one time.

D. All appliances must be sufficiently protected from shock hazards and must be maintained in good repair with no insulation damage or exposed wires.

E. Electrical cooking equipment such as fry pans, popcorn poppers, toasters, hot plates etc... are not authorized for use in student rooms. Well maintained coffee pots and water warmers are allowed so long as they are placed on a noncombustible surface such as ceramic or metal.

F. Electrical cords must not be crushed, compressed, constricted or coiled in a manner which may cause breakdown of insulation or cause an induced current to appear in adjacent metal objects.

G. Heat-producing equipment such as lamps, grow lights, heaters and sun lamps may not be operated in confined spaces or in close proximity to ignitable material.

H. Draperies, tapestries, blankets or posters which are displayed on walls, ceilings and doors in a manner that would facilitate ignition, block exits or fire detection units, or present overhead fire hazards - are not authorized.

I. Self-constructed furniture, posters, papers and combustible decorations may not be present in sufficient amounts to constitute an excessive combustible fire load. Decisions concerning fire load violations will be rendered in accordance with the judgement of the inspector.

J. Burned or burning candles are unauthorized. Unburned decorator candles are allowed so long as they do not contribute to an excessive combustible fire load.

K. Poor housekeeping practices which contribute to an excessive combustible fire load, hinder quick exit from a room, or cause combustible material to be located near sources of ignition - must be corrected.

L. Self-constructed furniture and furniture arrangements which hinder quick exit from a room are prohibited.

M. Motorcycles, firearms, flammable liquids, explosives, fireworks, compressed gasses, toxic materials, chemicals and open flame-producing devices will not be stored in residence halls.

N. Holiday decorations should be noncombustible or flameproofed. Elaborate decorations using combustible materials are not authorized. Papers and streamers attached to ceilings are not allowed.

Figure 27

COLORADO SCHOOL OF MINES
RESIDENCE HALL
LIFE SAFETY
AND
FIRE SURVIVAL PROCEDURES

EMERGENCY PHONE NUMBERS:

*FIRE/AMBULANCE/POLICE (EMERGENCY)	911
*PUBLIC SAFETY	273-3333 or 278-0757
*GOLDEN POLICE/FIRE DEPT. (NON EMERGENCY)	279-2557

WHEN YOU MOVE IN:

- Locate at least two routes of emergency exit from your living area. Familiarize yourself with the features and landmarks of each exit so that you could confidently use them if they were dark and smoky.
- Identify locations of fire alarms, smoke detectors, or extinguishers in the vicinity of your room.
- Do not furnish or decorate your room in a manner that would hinder quick exit or facilitate fire ignition. Remember that hazardous objects, materials or conditions in your room could threaten the well being not only of yourself but also of others.

PLEASE DO:

- KEEP FIRE DOORS CLOSED in stairwells and hallways.
- When you leave your room, make sure that all electrical appliances are off and that cigarettes are extinguished.
- Empty your wastebasket often. Check to make sure that any ashes or cigarettes are completely cold before they are discarded.
- Leave the building immediately if the fire alarm sounds. IT IS ILLEGAL TO REMAIN IN A BUILDING WHEN A FIRE ALARM SOUNDS.
- Inform the Residence Life Staff immediately if you have any information concerning persons who initiate false fire alarms or abuse fire safety equipment.
- If you smell smoke or suspect a fire, Y O U should sound the fire alarm in your building. If you sound an alarm, you should also call the fire department at 911 or 279-2557.

PLEASE DON'T:

- Don't store any loose materials (bottles, bags) on your window sill.
- Don't prop open fire doors or dismantle the self-closing devices on room or fire doors.
- Don't smoke in bed, burn candles, or use any exposed element cooking device or open flame in your room.
- Don't use multiple outlet devices (cube taps) that plug directly into wall outlets. If you must have more outlets, use a type of device that has internal fuses or breaker protection.
- Don't hang combustible materials from the ceiling (blankets, posters, flags, etc...)
- Don't place combustible furnishings, decorations or other material near electrical devices, cords or outlets.
- Don't ignore any fire alarm.
- Don't store flammable liquids, old newspaper, chemicals, or other hazardous material in your room.
- Don't sound a false fire alarm. It's a dangerous, reckless crime that could threaten the lives of others.

IN THE EVENT OF A FIRE:

- Stay calm and think things through. Be aware that smoke is the biggest threat to you in a fire, not heat or flames. Don't overestimate your tolerance to smoke. If you can safely use an exit to get clear of the building, do so. If the corridor of stairwell is very smoky, it may be best if you stay in your room, seal the door to keep smoke out, and wait for help.

IF YOU LEAVE YOUR ROOM:

- Before you open your door, check its temperature by touching the knob or the interior door surface with the back of your hand. If your door is warm, don't open it. If your door is cool, open it cautiously and check for smoke in the corridor.
- Close all doors and windows behind you - especially fire doors.
- Be ready to turn back if smoke becomes intense.
- If you become trapped by smoke, drop to your knees and crawl. The air is cooler and cleaner near the floor.
- Use the stairs - not the elevator (in Twin Towers). The elevator can be a trap. It can also deliver you right into the fire.
- If your clothes catch fire - stop, drop and roll to extinguish the flames.
- Take care of yourself first. Let the fire department help your friends if rescue is required.
- When you are out of the building, move clear of the fire scene. Report your presence to a Residence Life staff member.

IF YOU ARE TRAPPED IN YOUR ROOM:

- Use any handy material such as tape, wet towels, clothing etc. to seal cracks around doors or windows.
- Hang a sheet out your window to signal your presence. Use your telephone if it works. Call the fire department at 911 or 279-2557 and let them know where you are.
- Keep close to the floor to avoid smoke.
- Don't break or open your window unless your room is heavily invaded by smoke and you must get air to survive.
- Put a wet cloth over your nose and mouth to help filter out the smoke.
- Be as calm and patient as you can. Help is on the way. Don't jump.

DO NOT OBSCURE OR DAMAGE THIS INFORMATION SHEET.
REPLACEMENT EXPENSE WILL BE CHARGED TO THE OCCUPANTS.
REPLACEMENT COST $20.00

3/13/95-Bobrept/Rept47C

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

The Resource Conservation and Recovery Act (RCRA) is a federal law that regulates hazardous waste generation on the campus of the Colorado School of Mines. RCRA imposes limitations on the types and quantities of waste that the School can produce. RCRA also establishes time limits for storage of waste on the campus. It is very important for the School to maintain compliance with the waste handling procedures in RCRA. Noncompliance with this law can result in fines and enforcement action against the School by regulatory agencies. Individuals may also be charged with civil and criminal violations according to RCRA. The Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division has the legal authority to enforce these regulations on the CSM campus.

The School policy concerning RCRA compliance procedures can be found in an document entitled "Policies and Procedures Concerning-Procurement of Chemicals and Hazardous Waste Management & Disposal on the CSM Campus." Copies of this document have been distributed to all Departments. Additional copies of this document can be obtained from the Environmental Health and Safety Office. A abbreviated summary of these policies and procedures follows.

RESPONSIBILITIES OF LABORATORY PERSONNEL

Individuals who procure or use chemicals which eventually become waste are assigned primary responsibility for ensuring that the waste is properly managed in the laboratory and is subject to timely collection. This responsibility cannot be delegated. Knowledge of, and participation in the institutional waste management program is mandatory for persons who generate chemical waste in university teaching or research facilities. Specific responsibilities of the individual waste generator include:

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1. The individual generator must identify waste material and initiate collection in a timely manner which minimizes both the quantity of stored waste and time that the waste is in storage. The individual waste generator accomplishes these goals by attaching tags to waste containers and by submitting waste disposal forms to the EHS Office.

2. An annual inventory of all chemicals stored in the laboratory or in common storage areas is required. Laboratory supervisors compile the inventory and submit it to the Department Head. The Department Head submits an annual departmental inventory to the EHS Director. Accomplishing the inventory is a principal means of ensuring that wastes and unused chemicals are disposed of in a timely manner, and that highly toxic, reactive and "time sensitive" chemicals are properly managed. The inventory is also required by "Employee Right to Know" and "Community Right to Know" laws.

3. When an individual generator plans to retire, move, graduate, etc., he/she must ensure that any leftover chemicals or chemical waste are subject to collection and proper disposal or redistribution before he/she leaves. This includes any waste or chemicals which may be kept in common storage areas.

4. The individual generator must ensure that waste containers are accurately labeled.

5. The individual generator ensures that wastes are kept in containers which are equipped with secure screw-on caps and which are made of materials that are compatible with contents.

6. The individual generator ensures that wastes are stored in secure chemical storage cabinets/locations and that containers of incompatible wastes are effectively segregated.

7. The individual generator ensures that incompatible wastes are not mixed in the same container and that strict control is maintained over the addition of material to bulk containers of mixed waste.

8. When applying for grants, planning future experiments, developing teaching projects, etc., individual researchers and instructors must keep in mind that disposal of waste can be extremely costly, and,

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that sources of funds for waste disposal must be identified before the generation of waste begins.

9. In teaching laboratories, the instructor is responsible to devise a system for collecting wastes generated by students. The system should conform with the general guidelines provided in the section titled "Consolidation of Waste".

WHAT IS A HAZARDOUS WASTE

All solvents or other chemical waste produced in laboratories should be assumed to be legally regulated "hazardous waste" unless otherwise determined by the EHS office. Do not dump chemicals down the drain. For more specific information concerning the identification of regulated hazardous waste, review the Hazardous Waste Policies and Procedures Manual in the Department Office or consult with the EHS Office.

LIMITATIONS ON THE ACCUMULATION OF WASTE AND ON THE RATE OF WASTE GENERATION

1. Individual laboratories may not generate more than 50 Kg per month of hazardous waste and not more than .5 Kg per month of acute hazardous waste. In addition, individual laboratories may not accumulate more than 25 Kg of hazardous waste and not more than .25 Kg of acute hazardous waste in the laboratory or in common storage areas at any time.

2. Individual buildings may not generate more than 100 Kg of hazardous waste and not more than 1 Kg of acute waste per month. In addition, individual buildings may not accumulate more than 1,000 Kg of hazardous waste and not more than 1 Kg of acute hazardous waste at any time.

When applying for grants, planning future experiments, developing teaching projects, etc., department heads, individual researchers, and instructors must keep in mind that generation of waste at a rate which exceeds these limits, or accumulation of quantities of waste which exceed these limits can invoke rigorous federal and state regulations which may have a dramatic impact on the level of regulatory compliance of the entire institution. For these reasons, individual researchers should initiate consultation with the EHS Office early in the planning stage of an experi-

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ment which may produce quantities of waste which exceed the aforementioned limits.

THE WASTE COLLECTION AND CHEMICAL REDISTRIBUTION SERVICE

Lab personnel initiate pickup and disposal of hazardous waste or redistribution of unused chemicals by submitting a "Request for Chemical Recycling and Waste Disposal" form to the Environmental Health and Safety (EHS) Office at Chauvenet Hall; phone: 273-3316. Lab personnel also must fill out container identification tags and attach them to each container which is offered for disposal or redistribution. Figure 28 is a sample "Request for Chemical Recycling and Waste Disposal" form. Figure 29 is a sample container tag. Each container must be accurately labeled concerning contents. The originator of the request specifies the time, date, and place for the collection of waste. The originator must be present at the time of collection. The EHS Director responds to the request, removes the waste and arranges for disposal at an authorized disposal site. Material which is still usable will be stored at the Chemical Storage and Distribution Facility located at Coolbaugh Hall. These chemicals will carry a zero value.

The EHS office provides forms, tags, blank waste container labels, and up to five one-gallon waste containers per month to requesting laboratories. There is no charge for this service so long as quantities of waste do not exceed the limits described on the preceding page.

WHO FILLS OUT THE FORMS, TAGS, AND MAINTAINS CONTAINER LABELS

Persons who have procured or used the waste material should arrange for disposal. Lab supervisors or occupants of the lab should accomplish this task if the original procurer is unavailable. Waste disposal should not be postponed nor should responsibility for disposal be delegated to temporary helpers, departmental technicians or clerical workers.

TAGS AND LABELS

Each waste container must be accurately labeled concerning contents. Give the specific chemical name; not chemical formulas, common names or trade names. If the material is a mixture, list each constituent

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separately. Indicate concentrations of solutions or percentages by weight of each component of a mixture.

A completed container identification tag must be attached to each waste container. The number on the tag must correspond with the number indicated in section 3 of the "Request for Chemical Recycling and Waste Disposal" form. The container tag may serve as a label of contents, if no other label is provided. Contents must be indicated on either the tag or on another label which is also affixed to the container. The EHS Office provides blank waste container labels and tags upon request.

In laboratories which use several containers for the consolidation of compatible wastes, and if these containers are used jointly by several people--the label should indicate: the name of each person who has made each addition to the container; the chemical identity and the quantity of each addition; and the date of each addition.

FREQUENCY OF WASTE COLLECTION

In order to avoid exceeding the aforementioned storage limitations, the EHS Office will collect waste as often as twice a week from individual laboratories.

CONSOLIDATION OF WASTE

In many teaching and research laboratories it will be necessary to devise a system for consolidating compatible wastes in one or more containers.

No single system will work for all laboratories; however, the following may serve as a model which can be modified to the needs of individual laboratories.

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1. Liquid wastes should be segregated according to the following categories:

   a. acids (exception: hydrofluoric acid)
   b. bases
   c. non-halogenated organic
   d. halogenated organic
   e. oxidizers (e.g., organic peroxides, hydrogen peroxide)

   Provide additional separation for any of the aforementioned categories which contain heavy metals or other toxic contaminants. Sulfide or cyanide containing wastes and strong oxidizing acids should also be segregated.

2. Solid wastes should not be mixed with liquids. Generally, each type of solid should be kept separate.

3. Highly reactive materials such as pyrophorics or water reactive should, obviously, be kept in segregated storage.

In laboratories which use several containers for the consolidation of compatible wastes, and if these containers are used jointly by several people--the label should indicate: the name of each person who has made each addition to the container; the chemical identity and the quantity of each addition; and the date of each addition.

CONTAINERS

The EHS office will provide up to five waste containers per month to individual laboratories. These containers will be no larger than one-gallon size and are available in glass or plastic. Containers used for the consolidated storage of hazardous waste should not exceed one-gallon size. If larger containers are needed, consult first with the EHS Office. Consolidation of waste in, 30- or 55-gallon drums, should not occur in laboratories or in academic buildings. Such a practice creates fire code violations and increases the probability of a large-scale leak or spill. Bulk storage of consolidated waste also compounds the problem of maintaining accurate labels.

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There should be no need for lab or departmental personnel to maintain bulk storage of consolidated waste since the EHS office is available to make weekly waste collection trips to individual laboratories.

Waste containers should be equipped with secure screw-on caps, in good condition (no corroded metal cans) and should be constructed of material which is compatible with contents. Containers of waste must be accurately labeled. Waste in containers which do not meet these standards will not be collected.

REDISTRIBUTION AND RECYCLING

Laboratory workers are encouraged to identify unused chemicals and offer this material for redistribution and use in other campus laboratories. In fact, a main goal of the Hazardous Waste Management Program is to minimize the amount of chemicals which are stored in campus buildings. If a chemical has no intended purpose it should not be subject to indefinite storage in a laboratory. Rather, such materials should be either offered for redistribution or identified as hazardous waste and disposed of accordingly. Laboratory workers can use the request for disposal and recycling forms to initiate collection and redistribution of unused chemicals. Personnel in the laboratory also attach container tags to material which is offered for redistribution and note on the tag that the contents are intended for reuse.

The EHS office receives the "Request for Chemical Recycling and Waste Disposal and Recycling" forms, collects the material and stores it in the Chemical Storage and Distribution Facility (CSDF).

A complete inventory of the chemicals stored in the CSDF is available on the campus wide computer system under the title, "Chemical Stores Database" located in the lynx system.

Many of the wastes generated by the School may be recyclable. The EHS office will specify that the private hazardous waste management company which provides the disposal service will subcontract with local waste recyclers to handle wastes which can be reclaimed. This effort will occur each time the private hazardous waste management company is called in to accomplish packing, shipment, and disposal.

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WASTE COMPRESSED GASES

Laboratory personnel initiate disposal of the more common gases by returning cylinders to the supplier. Laboratory personnel can utilize the School's centralized waste collection and disposal program to dispose of gases which the supplier will not accept.

SEGREGATION OF WASTE CONTAINERS

As is the case with all other stored chemicals, containers of incompatible wastes must be physically segregated in order to prevent accidental mixing. A basic system for segregating incompatible waste containers is as follows:

1. Flammable liquids
2. Oxidizers
3. Acids
4. Bases
5. Solids
6. Other

COLORADO SCHOOL OF MINES ENVIRONMENTAL HEALTH AND SAFETY PROGRAM

REQUEST FOR CHEMICAL RECYCLING AND WASTE DISPOSAL

ead instructions on back before filling out
he information on this form must be accu-
ate, complete and legible. Improperly filled
ut forms will not be accepted. Inaccurate
formation could cause regulatory violation,
nvironmental degradation or severe safety
azards to persons who will handle this
aterial

Submit completed forms to
Environmental Health and Safety Office
Phone 273-3316
Call with questions or requests for assistance

GENERATOR INFORMATION

PARTMENT: _____

ILDING: _____

CATION OF WASTE TO BE COLLECTED (Room No.): _____

NAME OF PRINCIPAL INVESTIGATOR, MAJOR PROFESSOR OR LABORATORY SUPERVISOR: _____

NAME OF PREPARER: _____

(2) **GENERATOR'S CERTIFICATION:**

Date: _____ Phone No.: _____

I certify that the contents of the waste containers listed on this form are accurately identified.

Printed Name: _____ Signature: _____

CONTAINER (Correspond with no. on ntainer tag.)	E.H.S. OFFICE USE		(4) SPECIFIC CHEMICAL NAME/IDENTITY (If a mixture - list all constituents. Write chemical name - not formulas, common names or tradenames. Indicate concentration of solutions or percentages by weight of each component of a mixture.)	E.H.S. OFFICE USE		(5) LIQUID/ SOLID/ GAS	(6) QUANTITY OF WASTE in Kilograms (Kg.)	(7) CONTAINER SIZE AND TYPE (Glass, metal, plastic, etc. Volume in Liters.)	(8) FOR REUSE/ RECYCLING? Y/N
	T.W.	Comp.		Consol.	Empty				

E.H.S. OFFICE USE
COLLECTION DATE

Container #
22152

CONTAINER IDENTIFICATION TAG

NAME OF ORIGINATOR: _____

DEPARTMENT: _____

(Check One) 1) Dispose of as waste ☐
2) Offered for redistribution ☐

SPECIFIC CHEMICAL NAME/IDENTITY

(Fill out this section if a label of contents is not already provided. Write chemical name - not formulas, common names, etc. If a mixture, list all constituents. Indicate concentration of solutions or percentages by wt. of each component of a mixture.)

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Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Mining properties under the control of the Institution will be managed and operated in compliance with federal Mine Safety and Health Administration (MSHA) regulations. All applicable standards of 30 CFR, Parts 1 through 199, will be met, specifically including Parts 48, 49, 57 and 58. Active mines (whether or not ore is produced) will be inspected every three months and have current certification from the State Mine Inspector. These facilities will also comply with all applicable sections of CRS Title 34, Articles 20 through 54 (State of Colorado - Mines and Minerals Regulations), specifically including Article 47 ("Safety Regulations in Metal Mines") and Article 40, Section 122 ("Safety Training").

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
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The storage and/or use of explosives in facilities controlled by the Institution, or elsewhere on behalf of the Institution, must be in full compliance with 29 CFR, Part 55 (Treasury Department - Bureau of Alcohol, Tobacco & Firearms regulations on explosives). Any transportation of explosives on behalf of the Institution must be in full compliance with 49 CFR, Parts 106 through 397 (U.S. Department of Transportation Regulations).

Issued by: R.A. MacPherson, Director, EHS
Replaces: N/A
Approved by: George Ansell, President
Effective Date: April 1, 1995

Transportation of Hazardous Materials is governed by the Federal Department of Transportation (DOT). The DOT has promulgated numerous regulations that govern the transportation of these materials. These regulations are contained in the Code of Federal Regulations (CFR) 49 Parts 106 - 397. These regulations contain many requirements regarding the transportation of hazardous materials by motor vehicle. These requirements include extensive requirements for:

1. Packaging and labeling
2. Driver licensing and training
3. Vehicle placarding
4. Manifesting of cargo contents
5. Compatibility of cargo items and stowage requirements

The enforcement authority for Hazardous Material Transportation regulations in Colorado is the Colorado State Patrol and local law enforcement agencies. Their enforcement authority extends to all public roads and streets on campus.

Due to the complex nature of these regulations, all transportation of hazardous materials in state-owned vehicles or of CSM-owned hazardous materials in non-state owned vehicles must be coordinated thorough the EHS office.