CHEMICAL HYGIENE PLAN

Materials Science Division

Purpose

The purpose of the Chemical Hygiene Plan is to establish a program ensuring that control methodologies are implemented to prevent unacceptable exposure to hazardous chemicals in laboratories. The plan implements the requirements set out in the Argonne Environment, Safety and Health Manual, section 4.2.

Scope

This plan applies to laboratory operations using hazardous chemicals in relatively small quantities. For operations involving chemicals and not designated as laboratories, all other OSHA standards in 29 CFR Part 1910, including exposure standards, continue to apply. In addition to provisions of this plan, the Argonne Environment, Safety and Health Manual shall also apply.

Objective

The objective is to promote laboratory health and safety by ensuring that the proper procedures, training, and a written chemical hygiene plan are in compliance with 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories" (also known as the OSHA Laboratory Standard), as well as other applicable regulations the Laboratory is required to follow.

APPROVALS

MANAGEMENT HAS READ THIS DOCUMENT AND GIVEN ITS AUTHORITY TO IMPLEMENT THE LABORATORY STANDARD IN COMPLIANCE TO THE OSHA REGULATION. ALL EMPLOYEES ARE REQUIRED TO ABIDE FAITHFULLY TO ITS INTENT FOR THEIR HEALTH AND WELFARE AND THOSE OF THEIR FELLOW EMPLOYEES.

Urs Geiser	Urs Geiser	1/16/2008
Division Chemical Hygiene Officer		Date
Jim Woodring	J Z Woodring	1/16/2008
Site Chemical Hygiene Officer		Date
George Crabtree	George Crabtree	1-17-08
Division Director		Date

Topics

1. General Principles.
2. Levels of Responsibility.
3. Role/Function of Division Chemical Hygiene Officer (DCHO).
4. Exposure Assessment and Reduction
   - 4.1 Hazard Identification.
   - 4.2 Chemical Procurement, Distribution, and Storage.
   - 4.3 Laboratory Safety Operating Procedures.
   - 4.4 Laboratory Environmental Monitoring.
   - 4.5 Engineering Controls.
   - 4.6 Designated Areas.
   - 4.7 Emergency Plan/Spill Control.
5. Training Program.
6. Medical Consultation and Evaluation.
7. Respirator Use.
8. Waste Disposal/Waste Minimization Program.
9. Recordkeeping.
10. Appendix.
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    - 10.2 Hazardous Chemical Listing.
    - 10.3 Responsible Personnel.
    - 10.4 List of Acronyms.
    - 10.5 Termination Clearance Forms.
    - 10.6 OSHA Laboratory Standard: Training Documentation Record
    - 10.7 OSHA Laboratory Standard: Standard transmittal memo for use of hazardous chemicals in designated areas

1. GENERAL PRINCIPLES.

All chemicals, because of concentration, toxicity, flammability, carcinogenicity, or other characteristics, are potential health hazards. The intent of the Chemical Hygiene Plan is to provide guidelines for handling and using chemicals without causing harm to oneself, other employees, or to the laboratory environment.

1.1 Minimize exposure.

Even for substances with no known significant hazard, exposure should be minimized. When working with substances which present special hazards, special precautions should be taken. Engineering controls and personal protective equipment should be used to minimize exposures. Gloves will be provided by the DCHO Division Chemical Hygiene Officer (Urs Geiser) and will be specific for the hazard. Also, the DCHO can help plan experiments to minimize contamination of work areas.

1.2 Avoid underestimation of risk.

One should assume that a mixture presents all the hazards of its components. One should assume that all substances of unknown toxicity are toxic.

1.3 Provide employee exposure assessment.

Maintain employee exposure below the OSHA Permissible Exposure Limits (PEL) and other applicable exposure limits by exposure potential assessment and workplace exposure monitoring as appropriate. Two examples: monitoring asbestos conc. in breathing air, also non-chemical monitoring with available meters to determine if magnetic fields from our superconducting magnets are subjecting you to fields above the OSHA 8-hour standards. Many other determinations are possible. During experimental safety reviews, the risk of exposures is evaluated and if warranted further testing will follow.

1.4 Engineering controls.

Control methods such as laboratory hoods, local exhaust ventilation, enclosures, wet methods, etc., will be applied in preference to primary dependence on personal protective equipment such as respirators and safety glasses.

1.5 Availability of supporting documents.

The Argonne policies and manuals listed in Appendix 10.3 are available on the intranet at http://www.aim.anl.gov/manuals/

2. LEVELS OF RESPONSIBILITY

2.1 Division Director

Holds organizational responsibility for providing continuing support for chemical hygiene activities and the health and safety of laboratory employees.

2.2 Site Chemical Hygiene Officer (SCHO)

Provides site wide coordination and support for Division Chemical Hygiene Officers.

2.3 Division Chemical Hygiene Officer (DCHO)

Technically qualified individual designated by Division management. Responsibilities are outlined in section 3.0. DCHO will maintain records of training. This information must be maintained in an auditable form. The DCHO will provide regular chemical hygiene and housekeeping inspections, determine the required levels of protective apparel and equipment, and monitor the procurement, use, and disposal of chemicals used in the lab.

2.4 Division ESH Coordinator

Will ensure that facilities are adequate for any new hazard introduced into the laboratory and work with laboratory management, the DCHO, and other employees to develop and implement appropriate hygiene policies and practices. The Division Safety Coordinator will help project directors develop precautions and adequate facilities, as they apply to the OSHA Laboratory Standard and maintain compliance to the Chemical Hygiene Plan. See section 3 for a more complete description of duties.

2.5 Laboratory Supervisor

Has overall responsibility for chemical hygiene in the laboratory. The Laboratory Supervisor must ensure that employees know and follow the chemical hygiene rules, make sure protective equipment is available and in working order, and training and information have been provided. This includes assuring that Material Safety Data Sheets (MSDS) are readily available for substances used in the laboratory. Hard copies of the MSDS for all hazardous chemicals is preferred, however the on line database for MSDS can be more up to date. See the Argonne Chemical Management System at: https://www.cms.anl.gov/.

2.6 Laboratory Workers

Plan and conduct each operation in compliance with the established procedures and good personal hygiene practices and keep the laboratory supervisor informed. **Laboratory personnel are responsible to place warning signs and labels on chemical containers, equipment, or areas where special or unusual hazards are in use.** Signage and labeling will be thoroughly checked during semiannual safety inspections.

3. DIVISION CHEMICAL HYGIENE OFFICER (DCHO).

The DCHO for the Materials Science Division is Urs Geiser, who may be contacted in building **200/A161** or at **2–3509**.

The DCHO Role/Function is to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. The DCHO will:

- Work with administrators and employees to develop and implement appropriate chemical hygiene policies and practices.
- Monitor the procurement, use, and disposal of chemicals used in the area of responsibility, in conjunction with the lab supervisors.
- Review and approve operations as stated in the Chemical Hygiene Plan that require the approval process.
- Provide oversight on implementation of the Chemical Hygiene Plan.
- Help develop precautions and adequate facilities, as they apply to the OSHA Laboratory Standard. Keep vigilant of exposure possibilities and monitor when appropriate.
- Annually review, evaluate and update the Chemical Hygiene Plan for the area of responsibility.

4. EXPOSURE ASSESSMENT AND REDUCTION.

4.1 Hazard Identification.

Sufficient information about the properties of chemicals must be obtained to allow safe handling. Chemicals presenting an unusual or severe exposure hazard may require notification or approval by the DCHO, as specified in section 4.3.1.

Good chemical labeling practices shall be observed and labels on incoming containers shall not be removed or defaced. When materials are transferred from their original containers, the container into which the material is placed shall be properly labeled. Refer to Argonne Environment, Safety and Health Manual Chapter 4-3, "Chemical and Laboratory Safety" for proper labeling practices. Bar codes for the Chemical Tracking System (CTS) need to be applied to the chemicals as they are received and then collected after the chemical is used up so that it can be removed from the CTS.

A known chemical produced in a laboratory shall be evaluated, by reviewing the available literature, to determine if it is a hazardous chemical. An unknown chemical shall be treated as a hazardous substance.

Material Safety Data Sheets (MSDS) must be kept readily available for chemical substances. If a current MSDS is not available, it shall be requested whenever a chemical product is ordered. A large central file collection of MSDS is maintained by the Industrial Hygiene Section of EQO in Building 200, and these are available through the lab wide computer network. See the Argonne Chemical Management System at: https://www.cms.anl.gov/. If an MSDS is received which is not in the site inventory MSDS listing (listings in S227), a copy of the MSDS must be sent to the Industrial Hygiene Section for inclusion in the site listing.

If a substance is produced for someone outside of Argonne, the chemical must have a hazard warning label and a Material Safety Data Sheet prepared, and provided to the user. Industrial Hygiene (2-3310) and the DCHO must be consulted for review of a Material Safety Data Sheet before it is sent outside the Laboratory.

The DCHO will make hazard information available for acutely toxic, "select carcinogens," and reproductive hazards regulated by the OSHA Laboratory Standard. This information will be in the nature of Material Safety Data Sheets (MSDS), vendor supplied product information sheets, or reprints from appropriate reference sources. If this information is not available upon receipt of substance, contact the DCHO before handling the chemical. All other hazardous chemical information should be available on MSDS or product labels.

4.2 Chemical Procurement, Distribution, and Storage.

4.2.1 Procurement

When a substance is received, information on proper handling, storage and disposal must be known to those who will be involved. Do not accept any container that does not have an adequate identifying label.

The DCHO will coordinate the maintenance of an inventory of chemicals and chemical products through the site wide inventory program. A large central file of MSDS is maintained in building 200. These can be accessed through your PC network and the MSDS can be faxed to you at any time during the day or night. If you would like to have this service, let your DCHO know and he will arrange for its installation on your computer.

Any personnel obtaining chemical samples from an outside source are personally responsible to notify the DCHO if the material presents any unusual hazards. This may require an addition to your experimental safety review.

4.2.2 Laboratory Storage

Chemical storage within laboratories must be kept to reasonable quantities consistent with work in progress. Outdated and unneeded chemicals must be disposed of through Waste Management Operations (WMO). Consult the Argonne Waste Handling Procedures Manual. **Dispose of waste and excess chemicals as they become available.**

Chemicals which have a useable life must be dated by the manufacturer, or upon receipt in the laboratory. Refer to Argonne Environment, Safety and Health Manual Chapter 4-3, "Chemical and Laboratory Safety, and the appendix 4-3" for dating recommendations on ethers.

Flammable and combustible liquids must be stored in accordance with Argonne Environment, Safety and Health Manual Chapter 11-3, "Flammable and Combustible Liquids." In general, flammable materials of 1 to 5 gallons must be stored in approved safety containers, and 25 to 60 gallons stored in UL-listed flammable storage cabinets. Flammable materials must not be stored in refrigerators unless they are approved as explosion proof. Flammable storage containers will be provided as needed by the.

Chemical storage in fume hood work areas is not acceptable, except where highly volatile/noxious materials are in containers which may not be vapor tight and where placement in the hood does not interfere with proper ventilation and use. **The important consideration is if this storage constitutes an increase in hazard. No work can be performed in a hood used for storage if this work in any way produces an ignition source for the stored chemicals.**

Cooperation with a site wide chemical inventory effort is required. The need for this inventory will be assessed annually; unwanted/outdated chemicals should be searched for and properly disposed of as part of this process.

4.3 Laboratory Safety Operating Procedures.

4.3.1 Working with Chemicals

This section provides some general and specific guidance on chemical handling. Additional requirements are included in the Argonne Environment, Safety and Health Manual, Section 4-3 Chemical and Laboratory Safety, and the Division Safety Charter.

Management with the help of ES&H will provide appropriate personal protective equipment, such as eye protection, chemical resistant gloves and respiratory equipment when necessary.

The laboratory worker is responsible for compliance with policies and procedures on the use of personal protective equipment, and for disposal of contaminated equipment before leaving the use area.

Review and concurrence of the Division Chemical Hygiene Officer is required for the following procedures:

- Work with highly toxic materials. As a general rule, this applies to those substances with exposure limits below 1 ppm or 0.5 mg/m^3 of air (these numbers can be found in the Threshold Limit Values [TLV] available from the DCHO).

- Work with Class 1 carcinogens (Refer to Argonne Environment, Safety and Health Manual Chapter 4-5.).

New projects using hazardous chemicals require pre-operation safety reviews. Consult the Division Safety Charter and the ANL Environment, Safety and Health Manual.

4.3.2 Laboratory Workplace Hygiene

This section contains general guidance to supplement the specific work procedures. See also appropriate chapters of the Argonne Environment, Safety and Health Manual. Section 4-3 Chemical and Laboratory Safety.

a) Personal hygiene:

- Avoid unnecessary exposure to chemicals by any route. Do not deliberately smell or taste chemicals.

- Never pipette anything by mouth.

- Avoid eating, drinking, and smoking in areas where chemicals are present. These activities are prohibited in all laboratories unless specifically allowed.

- Storage of food and beverages in storage areas and refrigerators used for laboratory operations is prohibited.

b) Avoid the release of toxic substances. Weigh powders over disposable towels to avoid any possibility of contaminating work surfaces.

c) Hazardous chemical use must be restricted to rooms having ventilation hoods and/or direct exhaust. Recirculation of air from chemical laboratories to other rooms is not acceptable.

d) Ovens must be used only for their intended purposes. Ovens used for processing hazardous chemicals must be ventilated properly to control any hazardous emissions.

e) Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before starting any new operation.

f) When venting containers, or setting up containers with pressure relief joints or valves, take precautions to ensure that the discharge is directed safely or filtered. Be sure to properly relieve gas pressure from cylinder regulators before disconnecting.

g) Use a fume hood or approved containment for operations that might result in the release of toxic gases, vapors, or particulates. As a rule of thumb, engineering controls need to be used when handling any volatile substance with a TLV of less than 50 ppm, or the LC50 is less than 200 ppm, or oral LD50 is less than 50 mg/kg. (These numbers can be found in the Threshold Limit Values [TLV] available from the DCHO.)

h) Assure that the plan for each laboratory operation includes plans and training for waste disposal. Apply waste minimization to all operations. See the Waste Minimization Plan (item (d) Appendix 10.3) for more details.

i) Know the location of eyewash and shower facilities for your laboratory; these are required in or near each laboratory where hazardous chemicals are used. Weekly eyewash testing and documentation of this testing is required in auditable form. Showers are tested at 6 month intervals by PFS.

j) Use face shields, impermeable gloves and aprons, as appropriate, to avoid contact with chemicals. Safety glasses or chemical goggles are sometimes necessary in addition to face shields. Glove selection information is available from the Industrial Hygiene Section (2-3310) and at http://www.anl.gov/ESH/ih/glove_guide/index.htm. To supplement specific procedure training provided by supervisors, refer also to the National Research Council's "Prudent Practices for Handling Hazardous Chemicals in Laboratories," available in S-236 building 223.

k) When diluting concentrated acid, add acid to the diluent. Use an ice bath, or have a cold water source available, to reduce the reactivity hazards from extremely exothermic acid/base reactions.

l) The date of receipt and date of opening must be recorded on containers of chemicals that could present a long-term storage hazard; e.g., peroxide forming ethers. This is good laboratory practice for all chemicals.

m) Special procedures are required for certain extremely hazardous chemicals; e.g., phenol and OSHA substance specific chemicals, such as benzene and all select carcinogens (see ES&H manual chapter 4-5 Appendix A for list) before purchase

n) Chemical use outside of a laboratory hood requires evaluation of the exposure potential of toxic materials that may cause air contamination and possible need for respiratory protection or other control.

o) Wear appropriate protective apparel and gloves to prevent skin contact with allergens or substances of unknown allergenic activity (examples include diazomethane, isocyanates and bichromates).

p) Special care shall be taken to minimize chemical exposure during pregnancy. Questions should be directed to the DCHO.

q) Pregnant laboratory workers are requested to consult with the Medical Department at an early stage.

r) Refer to ES&H Manual Chapter 4-5, "Chemical Carcinogens," for additional requirements for carcinogen handling and documentation.

4.4 Employee Exposure Determination and Evaluation

Current and proposed uses of hazardous chemicals need to be assessed as to the potential for workplace exposure. The criteria to be assessed is if exposures could exceed established limits and whether dermal exposure can cause skin injury or absorption of toxic quantities. For materials that may have irreversible toxic effects or are classified as carcinogens, the concept of maintaining exposure as low as reasonably achievable (ALARA) should be followed. Factors to be considered in making the determination of exposure potential include:

a) Quantity used and frequency of use outside of fume hood.

b) Open container vs. covered systems and potential for airborne exposure.

c) Exposure controls currently in place.

d) Established occupational exposure limits, such as OSHA Permissible Exposure Limit (PEL), ACGIH Threshold Limit Values (TLV), or AIHA Workplace Environmental Exposure Levels (WEEL).

e) Toxicological information on the substance.

f) Review of handling precautions, the indicated hazards , or the hazard potential must be made by the supervisor. If there is concern about the possible extent of exposures or a need for additional information, this should be sought from the DCHO and the Industrial Hygiene Section.

Where the need is indicated, EQO-Industrial Hygiene will provide onsite review and exposure determination measurements. Results of monitoring will be reported back to the supervisor within 15 working days of receipt of the laboratory results. Supervisors have a duty to report results in writing to affected employees, either by personal communication or by posting of the results.

When monitoring has demonstrated that permissible exposure limits may be exceeded, or readily achievable improvements can further reduce exposures, such improvements will be implemented.

Input on implementing these changes will be provided by the Laboratory Supervisor, DCHO and ESH-Industrial Hygiene.

4.5 Engineering Controls

All laboratory fume hoods are to be tested at least annually by PFS-Building Maintenance personnel. Hoods designated for general chemical use (Class C) must maintain a minimum of 100 feet per minute (fpm) face velocity; those for radioactive or higher toxicity materials (Class R), must maintain 125 feet per minute (fpm) face velocity.

Any hoods not posted as being tested and meeting the above criteria within the past year must be brought to the attention of PFS-Building Maintenance by the laboratory supervisor. Hoods failing to meet the above test criteria will be tagged at the time of service, and a written notice will be sent to the division office. Hoods so tagged must be taken out of service until repaired or posted as to restricted service, as approved by the DCHO.

4.6 Designated Areas

When working with hazardous substances, additional employee protection is necessary. Designated areas are appropriate for work with acutely toxic substances, especially those with exposure limits below 1 ppm or 0.5 mg/m^3 of air.

Many exhaust ventilation systems are connected to the Central Surveillance System (CSS) which provides an alarm in case of flow failure. Hoods using acutely toxic materials and not connected to the CSS will be reviewed by the supervisor and DCHO to determine the need for individual hood flow indicators.

Special procedures for working in designated areas must be developed and approved by the Division CHO and Site CHO.

Designated work areas must be posted indicating the potential hazard and the requirement to follow the special work procedures established.

Due to the very limited use, quantity consumed or unlikely potential for exposure to the carcinogens registered in the MSD chemical inventory, no special SOPs are required. Carcinogens are all to be stored in secondary containers, generally consisting of a wide mouth poly bottle and are to be clearly labeled as carcinogens on the inner and outer container. In addition the place of storage, and where appropriate, the weighing and use area will also be marked. New purchases and changes in use will be monitored to determine if a change warrants stricter measures.

The following rooms are designated areas in the spaces occupied by the Materials Science Division for chemical work because of the potential chemical hazard present. Radiologically controlled areas are also listed for convenience.

Designated Areas for High Toxicity Materials, Select Carcinogens, or Reproductive Toxins			
Building	Room	Area	Reason
None			

Radiologically Controlled Areas			
Building	Room	Area	Reason
200	A-158	whole room	X-ray producing equipment
212	CL-220	whole room	X-ray producing equipment
212	G-239	whole room	X-ray producing equipment (accelerator)
223	D-126	inner rooms	X-ray producing equipment
223	A-236	small room	X-ray producing equipment
223	D-104	whole room	X-ray producing equipment
223	D-226	whole room	X-ray producing equipment
413	End station	whole room	Required by Advanced Photon Source

4.7 Emergency Plan/Spill Control

Refer to the Argonne Emergency Management Plan Volume I Sections 10 and 11.

Spills, accidents, explosions, fires, and similar incidents that have or may result in injury or significant property damage must be reported immediately using the Laboratory's 911 Emergency System.

Spills should not be cleaned up by laboratory personnel, unless proper supplies, training, and personal protective equipment have been previously provided. Non-emergency cleanup of identified materials can be requested from Waste Management Operations (2-5865).

Any chemical materials used or collected in a spill response incident must be held for proper disposal through Waste Management Operations. Spilled chemicals, contaminated glassware or other containers must not be disposed of in trash receptacles.

5. TRAINING PROGRAM

All new Argonne employees receive basic orientation in health and safety requirements and services of the Laboratory.

Supervisors have a duty to see that each employee is provided the necessary information and training on specific hazards of the materials they may work with.

In addition, each employee must be aware of the location of material safety data sheets covering materials in the workplace.

Employees must also be aware of provisions of the OSHA Laboratory Standard. This will be accomplished by circulating to affected employees a copy of the Chemical Hygiene Plan for this Division.

EQO will provide basic training classes on provisions of the OSHA Laboratory Standard and applicable site wide health and safety programs. The Division will provide specific instructions regarding Division activities.

6. MEDICAL CONSULTATION AND EVALUATION

Any employee who develops signs and symptoms indicating possible overexposure will be provided with medical attention. They must report to their supervisor and the Argonne Medical Department in Building 201.

When an unusual occurrence, such as a spill, results in a potentially significant exposure, a Dial 911 must be initiated to assure that prompt attention is received.

Where review by the DCHO and/or EQO-Industrial Hygiene indicates that significant exposure could occur, a Medical Department consultation will be sought regarding the advisability of biological monitoring for the toxic substance or its metabolites.

7. RESPIRATOR USE

Engineering controls such as laboratory hoods, enclosed operations, and lower toxicity substitute materials must be the first level of protection. Where engineering controls are not feasible or for temporary operations or where an additional level of protection is desired, respiratory protective equipment may be used.

All respiratory protective equipment selection and user training will be provided by EQO-Industrial Hygiene (2-5649). Retraining is required annually.

Respiratory protective equipment may not be purchased without prior approval of EQO-Industrial Hygiene. For emergency response situations and where approximate levels of contaminants are unknown, self-contained breathing apparatus (SCBA) use is required. Only persons who are currently trained in its use are authorized to use such equipment.

For additional procedures relating to use of respiratory protective equipment refer to the Argonne Environment Health and Safety Manual Chapter 12-2, "Respiratory Protection".

8. WASTE DISPOSAL/WASTE MINIMIZATION PROGRAM

Planning for waste disposal and minimization should be implemented before purchasing a hazardous chemical.

Serious problems of air and water pollution, as well as serious hazards to facility personnel, may be created by improper handling of the waste produced, even by small laboratory operations.

It is the responsibility of any chemical user to be sure that the ultimate fate of materials generated in the process or reaction can be safely and properly disposed. Each laboratory supervisor has the responsibility to ensure that waste chemicals are safely collected, identified, and stored for disposal, and that Argonne Waste Management is fully advised of any special methods or facilities required. Consideration must be made of the quantities ordered and possible reuse of chemicals in order to assure waste minimization.

Chemical wastes must be collected near the point of generation in registered satellite waste accumulation areas (SAAs). **It is divisional policy that the Argonne ESH Manual, section 10.6, and the Argonne Waste Handling Procedures, in particular section 1.2, will be followed in the management of SAAs.**

In the Materials Science Division, in order to receive the final check when out-processing from the division, it is necessary to obtain the Group Leaders signature that chemicals have been properly disposed of or transferred. The memo and forms have been included as Topic 10.5, "Termination Clearance Forms".

Waste must be properly identified and packaged for pick up and disposal by EWM-Waste Management Operations. Form EWM-197, "Chemical Waste Disposal Requisition," must be completed and sent to Waste Management Operations to initiate the waste disposal process.

For additional guidance on waste disposal/minimization procedures refer to the Argonne Waste Procedures Manual and the Argonne Waste Minimization Plan. Argonne now has the ACES program which allows transfer of unneeded chemicals to a central storage area. These chemicals are then available for free to anyone on site with a need for these. Please contact Urs Geiser (2-3509) or Mick Pahnke (2-4937) for information on this useful service.

9.0 RECORDKEEPING.

Records of information and training provided under the plan must be provided to the DCHO and to the ESH Training Coordinator for inclusion in the site-wide employee training database.

Management must maintain records of medical consultation and examinations for 30 years beyond employee/employer separation.

The SCHO must maintain current records of exposure limits specified by OSHA in 29 CFR 1910, subpart Z.

10. APPENDICES

10.1 Hazardous Chemical Information Sources

The major health exposure chemical lists and reference sources are:

- OSHA Air Contaminants (29 CFR 1910, subpart Z).
- OSHA Specifically Regulated Substances (29 CFR 1910.1001-1101).
- National Toxicology Program, latest Report on Carcinogens.
- International Agency for Research on Cancer, latest volume on human carcinogens (groups 1, 2A, and 2B).
- Teratogens identified in Thomas H. Shepard, Catalog of Teratogenic Agents, 6th edition, Johns Hopkins Press, 1989.

- NIOSH Registry of Toxic Effects of Chemical Substances, latest edition.
- Dangerous Properties of Industrial Materials, N. Irving Sax, latest edition.

10.2 Chemical Inventory

Site wide chemical inventory is updated yearly for MSD or as needed.

10.3 Argonne Policies and Procedures

The following Argonne policies and procedures are relevant to the Chemical Hygiene Plan:

- Environment, Safety and Health Manual, http://www.aim.anl.gov/manuals/eshman/
- Comprehensive Emergency Management Plan (not available on intranet)
- Waste Handling Procedures Manual, http://www.aim.anl.gov/manuals/whpm/
- Environmental Management System Description, http://www.aim.anl.gov/manuals/emsd/

10.4 List of Acronyms Found in the Chemical Hygiene Plan

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ALARA	As Low As Reasonably Achievable
ANL	Argonne National Laboratory
CFR	Code of Federal Regulations
CSS	Central Surveillance Systems
DCHO	Division Chemical Hygiene Officer
ES&H, ESH	Environmental Safety and Health
LC50	Lethal Concentration 50% -the atmospheric concentration expected to be lethal to 50% of a group of animals exposed for a specific time
LD50	Lethal Dose 50% -same as LC50 except administered in a dose other than atmospheric through inhalation
MSDS	Material Safety Data Sheets
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration

PEL	Permissible Exposure Limit/Published Exposure Limit -various chemical exposures allowed, expressed in many forms such as an 8 hour average concentration, a maximum (ceiling) limit, and others
PFS	Plant Facilities and Services
SCBA	Self-Contained Breathing Apparatus
SCHO	Site Chemical Hygiene Officer
TLV	Threshold Limit Value -an exposure value set where an agent would not be considered to be harmful for the period specified, often based on a 40 hour work week
WEEL	Workplace Environmental Exposure Level -similar to TLVs but set by different agency
WMO	Waste Management Operations

MSD CHEMICAL HYGIENE PLAN

By my signature, I certify that I have read the MSD Chemical Hygiene Plan. I also understand that Urs Geiser, of the Materials Science Division, is the chemical hygiene officer who should be contacted whenever there is a question relating to the use or safety of chemicals. He can be reached at ext. 2-3509 or by electronic mail (ugeiser@anl.gov).

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DATE: October 6, 1993

TO: MSD Group Leaders

FROM: Mick Pahnke MSD CHO
Bob Dunlap MSD Director

SUBJECT: Responsibility for Chemical Disposal Upon Employee Termination

HRS has instituted a computerized termination and clearance format which allows various check points before authorization is given for individuals to terminate from Argonne and receive their final pay check. Examples of check points are the library, bioassay, precious metals and the division where employed. In order to meet our responsibilities under the new system, the division is starting a sign out procedure where the group leader and the terminating individual's supervisor will need to authorize clearance from the division regarding final disposition of their chemicals. You as the group leader, will have the final responsibility of affirming that chemicals previously in the custody of this person have been adequately handled.

Chemicals have always constituted a problem when individuals have left, leaving behind years of samples, old chemicals and unknowns. In many cases the only person having knowledge of samples and "unknowns" is the person who created them, likewise the individual who purchased a chemical has the most knowledge of the hazards and therefore the proper disposal.

Chemicals for this definition are samples, boxed or bottled chemicals and unlabeled materials. If these are all to be kept, then simply transferring them to a new custodian is the logical step. However samples must be individually identified as to their chemical constituents and their radiation history, to allow disposal at a later date. A logbook or notebook for this purpose must accompany these samples. All materials in a lab must be labeled. A $300 to $500 cost will be incurred by your group for analysis of unknowns by the ACL. It is strongly recommended that unneeded samples and chemicals be sent to Waste Management Operations when they are no longer of use. For questions about disposal of non hazardous samples, contact Mick. We are all aware of how hectic the last few weeks before leaving can be, please start this process early and do not get caught short. If a constant effort is made to keep chemical and sample inventories small, no one individual should be unduly burdened by this new requirement.

cc S. Morss
A. Smith

Date:

TO: Group Secretary

FROM: Laurie Eichberger ETC Representative for MSD

SUBJECT: **Termination of PR #**

_____ is scheduled to terminate on _____ at _____. Please be sure he/she receives the enclosed paperwork. It should be completed and returned to me as soon as possible. Please ask _____ to note the time and date of outprocessing. He/she will need to see me to turn in his/her badge before reporting to HR. The time is noted on the Employee Termination Clearance Form.

Thank you for your help.

Attachments
Emp.Term.Clear.Form
Emp.Term.Clear.Form B

cc: Group Leader

kj

EMPLOYEE TERMINATION CLEARANCE FORM

NAME _____ TITLE _____

BADGE NO. _____ GROUP LEADER _____

TERMINATION DATE _____ HR OUT-PROCESSING TIME _____

☐ STAFF ☐ SALARY ☐ WEEKLY ☐ HOURLY

Have you received Educational Assistance-for tuition and fees-in the last 12 months?

☐ Yes ☐ No

Have you received a degree in the last 12 months? ☐ Yes ☐ No

Has all division property, i.e. manuals, equipment, keys (desks, offices, lockers, etc.), been returned?

☐ Yes ☐ No

Has all ANL Library materials signed out by you been returned?

☐ Yes ☐ No

Have you returned your radiation dosimeters (TLD badge, ring badge) and notified Health Physics?

☐ Yes ☐ No ☐ Not Applicable

Have all chemicals, samples, hazardous wastes, etc., in your custody been accounted for?

☐ Yes ☐ No ☐ Not Applicable

See attached form.

Forwarding Address - Must be completed – please print:

Street/Apt: _____

City, State and/or Country, Zip Code: _____

Telephone No.: _____

Supervisor's Signature _____

Group Leader's Signature _____

Please see Julie Emery, Bldg. 223, Room S238 on: _____ at _____.

Bring this form as well as Termination Clearance Form B (if applicable), if you have not already returned them. Bring your badge.

Your final paycheck will not be issued until all the termination procedures have been properly completed.

EMPLOYEE TERMINATION CLEARANCE FORM
PART B: CHEMICAL CUSTODY

NAME _____ TERMINATION DATE _____

BADGE NO. _____

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1) Did you generate samples during your stay in MSD?

☐ Yes Go to 2.

☐ No Go to 3.

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2) All samples I worked with are either properly disposed of or are needed and labeled with chemical composition, hazard warnings and radioactive components in a log book or notebook Book # _____ dated _____.

☐ Yes Go to 3.

☐ No Supervisor (or PI) has this information. Go to 3.

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3) All chemicals remaining from my work have proper labels with chemical composition, hazard and radioactive components detailed.

☐ Yes Go to 4.

☐ No Supervisor (or PI) has this information and will complete labeling. Go to 4.

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4) All chemical waste from my work has been detailed on Chemical Waste form WMO-197 and is ready for disposal.

☐ Yes Go to 5.

☐ No Supervisor (or PI) will complete disposal. Go to 5.

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5) All radioactive waste from my work has been detailed on Radioactive Waste form WMO-195 and is ready for disposal.

☐ Yes Go to 6.

☐ No Supervisor (or PI) will complete disposal. Go to 6.

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6) I accept the chemical responsibility from this employee, and he/she should be allowed to terminate.

Supervisor's Signature _____

Group Leader's Signature _____

Your final paycheck will not be issued until all the termination procedures have been properly completed.

OSHA LABORATORY STANDARD
TRAINING DOCUMENTATION RECORD

INFORMATION

I have been provided details of:

1. The contents of the Laboratory Standard, and its appendices.

2. The location and availability of the Chemical Hygiene Plan for my laboratory.

3. Hazardous chemicals located in my laboratory:
    * The permissible exposure limits for OSHA regulated substances.
    * The recommended exposure limits for other available.
    * Signs and symptoms associated with exposure.
    * Location and availability of reference materials on the hazards, safe handling, storage and disposal, including Material Safety Data Sheets.

TRAINING

I have been provided additional training that explained:

4. The physical and health hazards of chemicals in my work area

5. The methods and observations that may be used to detect the presence or release of a hazardous chemical.

6. Personal protective measures available to me.

7. Work practices, emergency procedures, and engineering controls available to reduce exposure.

8. The details of the Chemical Hygiene Plan for my laboratory.

OPTIONAL

9. Designated Area Training. Training will be provided after designated areas are assigned

By my signature, I certify that I have been informed and received training in the areas indicated. I have been given the opportunity to ask questions pertaining to any of the above topics.

_____ _____
Employee Name Employee Signature

_____
Date

OSHA LABORATORY STANDARD

To:
From:
Date:
Subject: Hazardous Chemical Use in Designated Areas

FOLLOW ESTABLISHED PROCEDURES AND STATEMENTS OUTLINED IN SECTION 4.3 OF THE CHEMICAL HYGIENE PLAN.

You have recently ordered the chemical , which is classified as a substance. Due to the health exposure nature of this substance, special handling procedures are required.
The following describes our policy for handling carcinogenic, reproductive toxins, and highly acute toxic substances. It is your responsibility to follow these procedures. Please read these procedures, sign the copy, have your project supervisor/manager sign the copy and then forward to me. The approved copy will be returned to you, after further review, providing authorization to proceed with the project.
Your cooperation in following these guidelines will insure a safe work environment for everyone.

1. The designated area where the chemical is handled, must be clearly labeled with the hazard of that chemical. This includes weighing areas, miscellaneous areas where the chemical may be released, and the work area.
2. The work surfaces of these areas must be covered with an absorbent disposable liner.
3. The work area must be in a properly ventilated area.
4. Wear chemically and solvent resistant gloves when handling these chemicals. These gloves must not leave the work area unless they are thoroughly washed. The user must wear a lab coat, and protective eye protection, if there is a possibility of being splashed.
5. Glassware must be rinsed into the waste container before leaving the designated area. Decontaminate the work surface with an appropriate solvent.
6. Contaminated solid waste must be placed in a leak-proof container and then disposed of as chemical waste. Plastic garbage bags can be used for dry waste, while solvent resistant, wide-mouthed jars can be used for wet waste. Double contain and label.
7. When finished with the chemical, return it to the specific chemical storage area.
8. If there is skin contact with the substance, the area should be flushed immediately with water.
9. If you ordered this chemical for another individual to use, then it is your responsibility to forward this document to the user.

_____	_____	_____
Employee Signature	Project Supervisor	DCHO Approval