CHEMICAL MANAGEMENT PROGRAM

Comments and questions regarding this policy should be directed to the contact person listed below:

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Sign-off Record:

Reviewed by: _____ Date: _____
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1.0 REVISION/REVIEW LOG

Environment, Safety, Health & Assurance (ESH&A) will review this document once every five years at a minimum:

Revision Number	Effective Date	Contact Person	Pages Affected	Description of Revision
0	11/1/97	J. Withers	All	Initial Issue
1	4/1/03	J. Withers	All	G:/docs&recs/dcp/ revisiondescription/Manual 10200_004.doc

2.0 PURPOSE AND SCOPE

The purpose of the Ames Laboratory Chemical Management Program Manual is to describe the policies and procedures in place that ensure worker and environmental protection from deleterious effects associated with the procurement, use and disposition of hazardous chemicals. Many aspects of this program are intertwined with other documented policies / procedures that are referenced throughout this manual.

Effective management of hazardous chemicals requires a "cradle to grave" approach. This philosophy also ensures compliance with numerous Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations denoted in the Laboratory's Work Smart Standards set (available at the ESH&A office, G40 TASF). The Chemical Management Program applies to the management of all hazardous chemicals within the Ames Laboratory. Chemical management is one component of the Laboratory's overall environment, safety and health program described in the *Environment, Safety and Health Program Manual (#46400.002)*.

3.0 BACKGROUND

Use of a wide variety of hazardous chemicals is critical to fulfillment of the Laboratory's research mission. Many of the Laboratory's research programs and several of the support offices (e.g. Facilities Services, Engineering Services) use hazardous chemicals. The Laboratory has over 10,000 chemicals on its inventory. The hazards associated with chemical use are significant and demand an effective management program. This document describes the various checks and balances in place to effectively reduce or eliminate those hazards.

4.0 RESPONSIBILITIES

4.1 Laboratory Director – The Laboratory Directory is ultimately responsible for ensuring that worker and environmental protection from hazardous chemicals is accomplished via the enforcement of chemical management policies and procedures described in this manual.

4.2 Program Director – Program Directors shall ensure that relevant chemical management policies and procedures are implemented at the programmatic level.

4.3 Group Leader - Group Leaders shall ensure that relevant chemical management policies and procedures are implemented at the research group level including the requirements of the *Iowa State University Chemical Hygiene Plan* and the *Ames Laboratory Readiness Review procedure (#10200.010)*.

4.4 Environment, Safety, Health & Assurance (ESH&A) – The ESH&A office shall assist Program Directors, Group Leaders and other Laboratory personnel in the implementation of relevant chemical management policies and procedures.

4.5 Employees – Laboratory employees who work with hazardous chemicals shall 1) be aware of the hazards associated with each of the chemicals used, 2) comply with all mandatory training requirements, 3) work in accordance with established chemical hygiene policies and procedures and 4) report unsafe work conditions to their supervisor and/or ESH&A.

5.0 CHEMICAL MANAGEMENT PROCEDURES

5.1 Iowa State University (ISU) Chemical Hygiene Plan (CHP)

The ISU CHP is the primary chemical management document at the Laboratory. It was adopted August 1st, 1997, and was distributed to all Group Leaders and Program Directors. A training module entitled Chemical Hygiene Plan Training for Ames Laboratory Group Leaders (AL-127) is required for Group Leaders. An electronic copy of the ISU CHP can be found at:

http://www.ehs.iastate.edu/publications/manuals/chp.pdf

The ESH&A office assists research personnel in implementation of site-specific chemical management programs based on the requirements of the CHP.

5.2 Employee Training

The Ames Laboratory Training Program is responsible for the development and implementation of the processes used to facilitate and document the training of all employees. A complete description of how employees are identified for chemical safety courses and how they are notified can be found in the *Needs Assessment Program (Procedure # 10200.029*).

A copy of the procedure is available in the ESH&A office, G40 TASF.

The following chemical safety courses are offered on a regular basis via classroom and / or computer-based formats:

CHEMICAL HYGIENE PLAN TRAINING FOR GROUP LEADERS (AL-127)
Provides an overview of ISU's Chemical Hygiene Plan (CHP) as outlined by OSHA's Laboratory Standard.
Target Audience: Required for Group Leaders working in laboratories where chemicals are used.

CYLINDER SAFETY (AL-022)
Provides an overview for the safe storage, handling, and use of compressed gas cylinders.
Target Audience: Required for all gas cylinder users.

HYDROFLUORIC ACID TRAINING (AL-134)
Covers the basic physical properties of HF, the associated health risks, the proper First Aid actions and the use of safety equipment.
Target Audience: Required for workers who use anhydrous fluoride and workers who use hydrogen fluoride (HF) in aqueous solutions during work activities.

CHEMICAL HAZARD COMMUNICATION (AL-137)
Covers chemical hazard information, including a Materials Safety Data Sheet (MSDS) exercise.
Target Audience: Required for employees who work with chemicals in laboratory and non-laboratory spaces.

These institutional modules supplement group or activity-specific training conducted in the laboratory. Group Leaders are responsible for ensuring their employees are aware of the hazards of the chemicals they are working with and the control measures in place to work safely

5.3 Procurement

Ames Laboratory tracks chemicals via the utilization of both a lab-wide chemical purchasing database (maintained by Purchasing and ESH&A) and group-specific chemical inventories (maintained by research group personnel).

Appendix A shows the processes by which chemicals are purchased and received by Laboratory employees. Chemicals are purchased via four mechanisms:

1) Ames Laboratory / IPRT Purchase Requisition
2) Chemical Stores Requisition
3) Ames Laboratory Credit Card

5.3.1 Ames Laboratory / IPRT Requisitions

Ames Laboratory / IPRT Requisitions (Appendix A) are filled out by employees and submitted to the Purchasing Department for review. If the material is on the ESH&A "concerns list" (Appendix B), Purchasing sends the requisition to ESH&A for review and approval. The requisition is then returned to Purchasing and a Buyer orders the material. Information from the requisition is entered into the Purchasing Database. Two ESH&A reports are generated from the database: the Hazardous Materials Inventory Report and the Weekly Purchase Report. Chemical materials are received at the Warehouse and delivered to the Purchaser by Materials Handling personnel.

5.3.2 Chemistry Stores Requisitions

Chemistry Stores Requisitions (Appendix A) are dispensed at the Ames Laboratory Storeroom. The ESH&A office reviews all Chemistry Stores requisitions for chemicals. An approved Chemical Requisition Review form (#46400.001, Appendix C) is required for purchase of the following:

Hydrofluoric Acid
Perchloric Acid
Picric Acid
Peroxidizables (Isopropyl Ether, Ethyl Ether
Dioxane, Tetrahydrofuran)
Adenosine 5' – Triphosphate (gamma 32^{P})
or ATP (gamma 32^{P})
Cyanides (Potassium, Silver, Sodium)

Chemical requisition review forms are reviewed and re-approved on an annual basis. After ESH&A approval, chemical materials are purchased at Chemistry Stores (1351 Gilman).

5.3.3 Credit Card Purchases

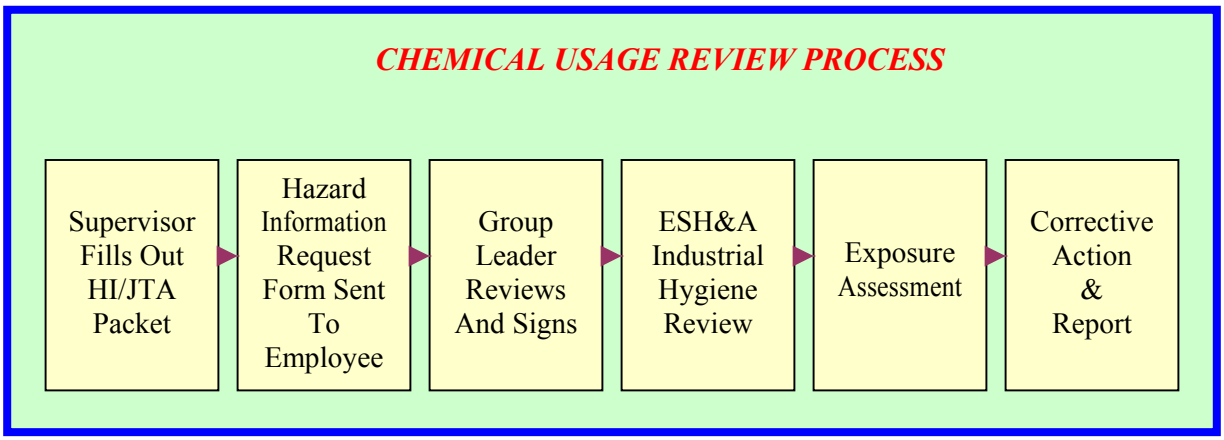
Ames Laboratory employees may purchase items including chemicals via a credit card mechanism. Each credit card user is required to attend a training session on the system works including a discussion on items that require prior approval by ESH&A (Procedure #58302.006). ESH&A reviews all credit card purchases via a monthly purchasing report. Additionally, the Purchasing Department assesses compliance with the credit card purchasing procedure via internal audit.

5.3.4 Life Cycle Management of Peroxide-Forming / Shock-Sensitive Compounds

Ames Laboratory has a formal tracking mechanism for materials that form peroxides and may be shock-sensitive. Appendix D shows a flow diagram by which these materials are identified and tracked until consumed or disposed. Basically, the process involves the identification of targeted items prior to or very shortly (usually one week) after purchase. The item is then tagged with a unique warning label, expiration date information is gleaned from the user and the material is then disposed or consumed prior to the expiration date. Peroxide-formers are uniquely identified and tracked in the Laboratory's master chemical inventory.

5.4 Usage

The diagram below shows the process by which chemical usage is assessed. Chemical usage is reviewed via the Hazard Inventory (HI). The HI is completed by the supervisor prior to a new employee being hired. Occupational Medicine personnel enter HI information into a database. A Hazard Information Request Form is generated for all OSHA-regulated materials and select chemical materials that are either acutely toxic or carcinogenic. The form is sent to the employee, reviewed and signed by the supervisor and returned to ESH&A. The ESH&A Industrial Hygienist reviews the information and determines if monitoring is necessary. IH exposure assessment data is entered into the database and used by Occupational Medicine personnel.



A complete description of the ISU Occupational Medicine Program can be found at:

http://www.ehs.iastate.edu/publications/manuals/occmed.pdf

5.5 Disposal

Disposal of hazardous chemicals is conducted in accordance with the *Ames Laboratory Waste Management Program Manual (#46400.001)*. An electronic copy of the manual can be found at:

http://www.external.ameslab.gov/esha/ESH&A_Documents/Manual102_003waste.pdf

5.6 Readiness Review

The Laboratory's *Readiness Review procedure (#10200.010)* is the mechanism by which new or significantly different chemical research is reviewed. An electronic copy of the procedure can be found at:

http://www.external.ameslab.gov/esha/ESH&A_Documents/proc102_010rev8_readinessreview.pdf

5.7 Walk-Throughs

The Laboratory's Walk-Through Program is utilized to provide assurance that the components of a comprehensive ES&H Program are in place and functioning. Safety, quality, environmental protection and chemical management are some of the functional areas observed. Results of the walk-throughs are used to deficiencies or areas of improvement in the Chemical Management Program. An electronic description of the Walk-Through Programs can be found at:

http://www.external.ameslab.gov/esha/ESH&A_Documents/proclist.html

5.8 Employee Check Out Procedure

All employees terminating their affiliation with Ames Laboratory are required to follow the *Employee Check Out Procedure (#58200.001)* administered by Human Resources. The procedure includes verification that all chemicals have been accounted for via disposal or reassignment.

APPENDIX A

CHEMICAL PURCHASING PROCESS
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IPRT Purchasing Requisition
Chemistry Stores Requisition

APPENDIX B

List of ES&H Concerns for Purchasing Review

APPENDIX C

ESH&A Chemical Requisition Review Form

APPENDIX D

Life Cycle Management of Peroxide-Forming and Shock Sensitive Compounds