
Ames Laboratory
Office Environment, Safety, Health & Assurance
Title Waste Management Program Manual
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Manual 10200.003
Revision 5
Effective Date 03/31/09
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WASTE MANAGEMENT PROGRAM MANUAL

This manual is to be used as a guide for Ames Laboratory personnel generating hazardous waste, mixed waste and radioactive waste from Ames Laboratory activities.

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1.0 REVISION/REVIEW LOG

The Environmental Specialist will review this document once every three years as a minimum.

Revision Number	Effective Date	Contact Person	Pages Affected	Description of Revision
0	01/01/94	K. Hannasch	All	Initial Issue
1	03/01/00	D. Kayser	All	G:\DOCS&REC\DCP\Revision Description\M102_003RevDesc.
2	04/07/03	D.Kayser	All	G:\DOCS&REC\DCP\Revision Description\M102_003RevDesc.
3	04/03/06	D.Kayser	All	G:\DOCS&REC\DCP\Revision Description\M102_003RevDesc.
4	05/19/08	D. Kayser	All	G:\DOCS&REC\DCP\Revision Description\M102_003RevDesc
5	03/31/09	D. Kayser	1, 3,8,13, 25-30	G:\DOCS&REC\DCP\Revision Description\M102_003RevDesc

2.0 INTRODUCTION

Ames Laboratory is responsible for properly managing its waste in a manner that provides for the protection of the laboratory employees, the general public and the environment. The Laboratory is required to comply with all applicable local, state and federal regulations.

In order for the Laboratory to manage its waste according to these regulations the specific policies and guidelines in this manual have been developed and implemented.

3.0 OBJECTIVE

This manual has the following objectives:

- Ensure and maintain the health and safety of Laboratory employees, visitors, and public.
- Protect the environment through proper management of hazardous, radioactive and mixed wastes.
- Minimize the cost of handling and disposing of hazardous, radioactive, and mixed waste.

- Minimize the generation of hazardous, radioactive, and mixed waste.

4.0 RESPONSIBILITIES

Responsibility for implementation of the Waste Management Program will be assessed according to “bottom-to-top” hierarchy. Emphasis of responsibility at the individual employee level will be most effective since nearly all waste is created at this level.

4.1 Individual Employees

All employees shall follow the waste management manual. By implementing the program at this level, success of the program will greatly increase. Individuals have the following responsibilities:

- Complete and remain current with all waste management related training, including institutional training modules and group/department job/activity specific training.
- Collect all waste in accordance with this manual, unless a written exemption is issued by ESH&A.
- Identify all waste chemicals or surplus chemicals utilizing technical knowledge within the department or by consulting ESH&A (4-2153).
- Package and label all waste to be picked-up by ESH&A according to this manual.
- Consult with Group Leaders/Supervisors regarding the safe handling and proper disposal of chemicals. Contact ESH&A (4-2153) for assistance at any time.

4.2 Group Leaders/Supervisors

The primary responsibility of the Group Leaders/Supervisors is to ensure that all personnel under their supervision, including other researchers and Group Leaders receive appropriate training and

strictly follow the guidelines in this manual. They also have the responsibility to minimize waste generation by limiting the use of

toxic chemicals and/or utilizing chemicals that are less toxic, flammable, and corrosive according to EPA regulations.

4.3 Environment, Safety, Health & Assurance

Environment, Safety, Health & Assurance department (ESH&A) will be responsible for providing guidance and review of DOE funded activities.

In cases of dual funding by the DOE and ISU contact ESH&A (4-2153) for guidance.

Responsibilities of ESH&A:

- Develop and implement policies and procedures for Ames Laboratory.
- Administer the Waste Minimization/Pollution Prevention Program.
- File and retain all required environmental reports.
- Determine type of training needed for those working with hazardous chemicals and radionuclides.
- Provide Ames Laboratory institutional level training.
- Conduct audits of Ames Laboratory space and practices to determine compliance with waste management policies.
- Pick-up and dispose of hazardous, radioactive, and mixed waste.
- Provide assistance to individuals in regards to waste management issues.

- Notify Group Leaders/Department Managers of regulation changes that may affect the way Ames Laboratory manages hazardous waste.

4.4 Upper Management

The Laboratory Director has ultimate responsibility for environmental, health and safety issues. These responsibilities are delegated to department managers, supervisors and individual employees. Upper management is responsible for enforcing the Waste Management Program Manual policies.

5.0 **Hazardous Waste Management Procedure (10200.047)**

Ames Laboratory (AL) generates and manages hazardous waste at all DOE owned buildings. Hazardous waste generated in ISU leased spaces (i.e. Gilman and Zaffarano) is managed by ISU-EH&S. All waste picked up by AL-ESH&A is taken to a storage room where containers are segregated and tracked according to waste classification. The following are procedures to guide Ames Laboratory employees in managing hazardous waste.

5.1 Training

Employees and students working with chemicals at Ames Laboratory will be required to complete Hazardous Waste Generators Training (AL-073) and Nano Technology Awareness training (AL-208) if working with nano materials. Group Leaders/Supervisors are responsible for providing training in all group/department specific waste handling procedures.

Each program or group/department must keep an accurate and current record of all group/department specific training that has been received. ESH&A will maintain institutional level training records.

Examples of items to be covered in waste management training include:

- Awareness and responsibilities of waste generation

- Characterizing and identifying waste
- Accumulation for disposal
- Record keeping and documentation
- Waste minimization opportunities

5.2 Hazardous Waste Definition & Identification

A complete definition can be found in the 40 CFR Part 261, subpart C. Ames Laboratory relies almost entirely on process knowledge from individual researchers to identify and characterize their waste. Accurate waste identification is essential to ensure the material is handled safely and managed properly.

A hazardous waste shall be identified in one of two ways. A waste may exhibit a characteristic that causes it to be hazardous by the EPA or the EPA could list it as a hazardous waste.

Characteristic Wastes:

- **Ignitability** – liquids with flashpoint < 60° C, solids that spontaneously ignite flammable gases and oxidizers.
- **Corrosivity** – a liquid with a pH < 2 or pH ≥ 12.5.
- **Reactive** – has the ability to explode or undergo rapid and violent reactions.
- **Toxic** – Harmful or deadly even at low concentrations.

Listed Wastes:

A hazardous waste is considered listed if it is found on the D, F, P or U list in 40 CFR 261. (See Appendix E-G)

Note: *Any material contaminated by a characteristic and/or listed waste must also be considered hazardous and managed according to this manual. (i.e. paper, plastic gloves, equipment, spill clean-up debris, etc).*

5.3 Hazardous Waste Acceptance Requirements

It is important to use the appropriate container when collecting hazardous chemicals. A chemical collected in the wrong container could pose a danger to Laboratory personnel, ESH&A personnel, property and the environment. ESH&A does not supply containers for accumulating waste. Containers can be purchased at Ames

Laboratory Stores located in Spedding Hall or at ISU Chemistry Stores located in Gilman Hall.

Use the following guidelines for collecting your waste:

- Use a separate screw top container for each waste generated.
- Use appropriate container size to match the amount of waste generated.
- Use original chemical containers if appropriately sized.
- All containers must be non-leaking with no protruding objects and tightly capped.
- All containers must be identified and appropriately labeled (see section 5.5 Labeling Requirements).

5.4 Chemical Segregation

Chemical segregation will prevent dangerous reactions and protect laboratory personnel and ESH&A personnel from potentially unsafe working environments.

Use the following guidelines when generating your waste stream.

- Collect inorganic materials separately and do not mix solids with liquids unless the process (“recipe”) calls for it.

- Containers with liquids are required to be in secondary containment. Both containers must be compatible with the liquid.
- Collect halogenated and non-halogenated organic solvents in different containers.
- Keep pump oil separate. Do not mix with other chemicals. If pump oil is known to be contaminated, indicate on container label.
- When in doubt call ESH&A (4-2153) for assistance.

5.5 Labeling Requirements

The Hazardous Waste Label (HWL) should be used on all hazardous waste containers. Use the following guidelines when filling-out the HWL.

- Use proper chemical or common names in identifying chemical compounds.
- Do not use chemical formulas, symbols, or structural formulas to identify a chemical.
- Enter the start date when the first addition is put into the container.
- Enter the closure date when last addition to the container occurred.
- An example of a properly completed HWL is shown in Appendix B.

5.6 Hazardous Waste Storage

EPA regulates the storage of hazardous waste containers. It is important to follow the guidelines outlined below. Failure to do so could result in EPA issuing fines. EPA allows generators to store waste in Satellite Accumulation Areas (SAA) temporarily.

Ames Laboratory has implemented the following guidelines in order to avoid such fines and to keep the workspaces in the Laboratory clear.

- All waste generated in a laboratory or shop must be stored in the same laboratory or shop.
- Ensure oxidizers used in organic reactions are completely spent/deactivated prior to placing in sealed containers.
- Hazardous waste may be accumulated for a period of 90 days, starting with the first addition to the container. After 90 days or when the container is full, the generator shall call ESH&A (4-2153) to have the waste picked-up.
- Liquid waste containers must be stored in secondary containment.
- Containers must always be closed during storage, except when being filled.

5.7 Hazardous Waste Acceptance Form

The Hazardous Waste Acceptance Form must be filled-out prior to AL-ESH&A picking-up waste containers. Leave completed forms with waste containers to be picked-up. The acceptance form is the primary tool for tracking a group's waste stream(s). The following must be entered on the form.

- Container number
- Chemical description by chemical name. **No formulas.**
- Quantity (kg or liters)
- Hazardous property (corrosive, toxic, carcinogen, nanoparticles, etc.)
- pH for liquids

An example of a properly completed Hazardous Waste Acceptance Form can be found in Appendix C.

5.8 Hazardous Waste Pick-up

Ames Laboratory Buildings: Call AL-ESH&A (4-2153) for pick-ups after a Hazardous Waste Acceptance Form has been completed.
ISU Buildings: Go to the following address to submit a pick-up <http://www.ehs.iastate.edu/cms/default.asp?action=article&ID=368>.

5.9 Tracking

Ames Laboratory-ESH&A tracks waste containers removed from Ames Laboratory owned buildings and ISU-EH&S tracks waste containers removed from ISU owned buildings. Waste containers are packed into lab packs by a contracted hazardous waste vendor for transportation and proper disposal.

5.10 Unbound Nano Particle (UNP) Waste

5.10.1 Definition

UNP waste contains engineered unbound nanoparticles (1 – 100 nanometers). All excess UNP materials, PPE, and clean up materials shall be containerized to eliminate the potential release of UNPs.

5.10.2 Labeling

Label containers according to section 5.5. Also, include the words “Contains Nanoparticles” and chemical composition.

5.10.3 Storage and Pick Up

Follow the procedures in sections 5.3 – 5.8.

5.11 Biohazardous & Non-Biohazardous Sharps (Packaging and Disposal)

Note: *If you are working with biological materials you are required to take “Bloodborne Pathogen Exposure Training” (AL-035). Contact ESH&A for assistance at 4-2153.*

Use the following guidelines for proper packaging and disposal of sharps:

- Keep infectious and non-infectious sharps in a separate container.
- Contain all non-infectious sharps in special metal or plastic containers designed for this purpose. Infectious sharps need to go into a red biohazard disposal box.
- There should be no protruding objects from the containers.
- Lid and caps should be taped and/or secured.
- The non-infectious sharps containers can be purchased at the Ames Laboratory Storeroom. Red biohazard containers can be purchased through Fisher, Lab Safety or other laboratory vendors.
- A Hazardous Waste Acceptance Form is **not** necessary.
- Call ESH&A (4-2153) for pick-up and/or questions.

5.12 Waste Minimization/Pollution Prevention & Affirmative Procurement

With respect to hazardous waste, proper Wmin/P2 & AP procedures include:

- Use the least toxic material available to perform a process.
- Purchase the least amount of material/chemical necessary.
- Recycle or reuse spent chemicals when possible.
- Complete the recycling loop by purchasing items containing recycled materials.

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For more information on waste minimization and pollution prevention please see the Laboratory's "Waste Minimization/Pollution Prevention Plan" which can be found on the Laboratory's web page under ESH&A or contact ESH&A for a copy.

5.13 Spill Response

Accidental release of chemicals occasionally occurs as a result of spills, leaks, etc. When spills happen there is the potential for harmful effects. Contingency planning can minimize potential problems and enhance personnel's ability to deal with routine spills effectively. Group Leaders, Department Managers and/or Supervisors are responsible for developing a "site specific" contingency plan for their locations and for training personnel under their supervision.

Ames Laboratory has set the following criteria for reporting and cleaning-up spills.

- Releases less than 1 liter of waste, generators may clean up the waste themselves. Contaminated material/debris shall be managed according to this section (5.0 Hazardous Waste Management).
- Spills greater than 1 liter must be reported to ESH&A (4-2153). Generators may clean up provided they have sufficient training and equipment to do so.
- Releases more than 4 liters, Plant Protection shall be notified immediately (4-5511), and they will initiate the appropriate response.

Regardless of quantity the following should be reported immediately to Plant Protection (4-5511) and/or ESH&A (4-2153).

- All spills of extremely flammable materials (flash point less than 20° F).
- All spills of extremely corrosive materials.

- All spills of extremely toxic materials.
- All mercury spills.
- All personal contamination.
- All leaking containers.
- All uncontrolled compressed gas releases.

6.0 Radioactive Waste Management Procedure (10200.048)

NOTE: *The use of radioactive materials must first be approved by Ames Laboratory ESH&A (4-2153).*

The following are procedures that will guide Ames Laboratory personnel in managing their radioactive waste.

6.1 Training

New employees at Ames Laboratory shall receive the appropriate institutional training from ESH&A (i.e. Waste Generator Training, Rad Worker II Training,). Group Leaders/Supervisors are responsible for providing training in all group/department specific waste handling procedures.

Each program or group/department must keep an accurate and current record of all group/department specific training that has been received. ESH&A will maintain institutional training records.

Radioactive waste management training will include the following:

- Awareness and responsibilities of waste generation
- Characterizing and identifying waste
- Accumulation for disposal
- Record keeping and documentation
- Waste minimization opportunities
- Response to radiological emergencies

6.2 Radioactive Waste Definition & Identification

For the purpose of this procedure, radioactive waste is any unwanted or discarded material, equipment or system component determined to be contaminated with radioactive materials.

Accurate waste identification by the generator is essential for Ames Laboratory to ensure it is handled and disposed of safely.

Health Physics personnel will assist with analyses to determine radioactivity and isotopic content of a material.

Note: *Any materials used to handle radioactive waste must also be considered radioactive and handled accordingly.*

6.3 Storage

A Radioactive Material Management Area (RMMA) is a designated location to store radioactive waste. The RMMA is the appropriate place to store radioactive waste. Radiological material storage within these areas requires that procedures be followed to continue acceptable operation of the RMMA.

The following procedures relate to RMMAs:

A RMMA:

- Shall be the smallest practical area and must be located within a Radiological Controlled Area.
- Should be properly posted, "Caution, Radioactive Material".
- Shall be operated by trained personnel. Personnel shall be trained before entering the RMMA. Contact ESH&A for training requirements and assistance (4-2153).
- Shall use proper disposal procedures for radioactive waste.
- Should not include storage of non-radioactive waste. Storage of hazardous waste in an RMMA is not permitted. Refer to section 5.0 for hazardous waste procedures.

- Combustible loading in an RMMA shall be minimized and the use of cardboard containers for storage is discouraged.
- Should consider fire protection, such as smoke detectors, water sprinklers, and fire extinguishers when they are established.
- Shall be routinely surveyed by Health Physics personnel.

6.4 Radioactive Waste Acceptance Requirements

The following requirements [Sections 6.5 - 6.7] should be used by radioactive waste generators to determine the appropriate steps which are required to have radioactive waste removed from their lab.

6.5 Procedures for Generators of Low Level Radioactive Waste

6.5.1 Radioactive Solids

A variety of solid radioactive waste products, which vary in half-life and activity, may be encountered when dealing with solid radioactive wastes. This includes such materials as paper, plastics, rubber gloves, glassware, metal tools, and large equipment items.

The cost of disposal will depend directly on the volume and weight of the radioactive waste produced. To minimize the waste volumes requires generators of radioactive waste at Ames Laboratory to use advanced planning, careful facility and equipment design, and control of work methods.

1. It is essential to separate ordinary non-radioactive trash from solid radioactive waste, whenever possible, at the point of origin. For this reason, solid radioactive waste containers shall be clearly identified with the radiation symbol, have a plastic bag liner, and be easily distinguishable from ordinary trash containers.

Depending upon the anticipated volume of solid radioactive waste, a suitable container or containers should be placed in

the work area. Containers must be approved by ESH&A Health Physics Personnel.

3. The waste generator is required to provide documentation of the identity and estimated quantity of radioactivity and see that the waste is properly labeled and contained. Solid wastes must be segregated at the source into combustible and noncombustible, as well as compressible and noncompressible. One further segregation of solid waste is made. If the waste consists of alpha-emitting material of ^{235}U or radionuclides with Z (atomic number) ≥ 93 , or half-life > 20 years, it is designated transuranic (TRU) waste if the radionuclide concentration is $> 3.7\text{E}6$ Bq/kg (100 nCi/g). (See section 6.5.3 for specifics on TRU waste requirements.) Secondary containers must be labeled to indicate the category of waste permitted in the container. It is essential that TRU waste be separated from non-TRU waste, since they are disposed of differently.
4. When a bag is full, it should be removed from the container, sealed and tagged.
5. The tag should include information concerning which radioisotopes are present, their activity (best estimate), the date, user (name of the person filling out the tag), and the building and room number.
6. Contact Health Physics and request a survey of the waste for both external radiation reading and for possible surface contamination (by smear survey). If survey results are within the limits, the waste can be picked up.
7. Following the Health Physics survey, the Radiological Control Technicians (RCTs) will remove the waste and transport it to a radioactive waste storage area. If the waste is in a fiber drum insert, the RCT will remove the fiber drum insert, seal the lid of the drum and remove it from the area. If the waste is in a plastic bag the RCT will simply remove the sealed bag.

6.5.2 Radioactive Liquids

1. The treatment of liquid wastes is generally more expensive than that of solid wastes. Therefore, it is highly desirable to make special effort to keep liquid wastes to a minimum.
2. As with solid wastes, the liquid wastes must be segregated by the generator at the point of origin. The nature of the waste needs to be identified by the generator also. **DO NOT MIX** radioactive wastes (liquids or solids).
3. Liquid radioactive waste shall be placed into properly labeled containers. Use a compatible container for liquid waste collection and label the container according to section 6.6. Keep liquid waste containers closed at all times to prevent evaporation and to prevent from spilling.
4. Liquid radioactive waste that is soluble or miscible in water should be kept separate from other liquids and the waste tag affixed to containers of such liquids should indicate that the liquid is aqueous.
5. Generators are expected to supply information with respect to the content of the liquid wastes. In particular, the identity and quantity of the radionuclides and the volume of each entry are to be recorded, as well as any other pertinent information regarding the potential chemical activity or hazards of the solution.
6. When containers are full, contact Health Physics who will survey them to determine radiation levels and potential surface contamination.
7. The RCT will take the waste after the survey is completed.

6.5.3 Transuranic (TRU) Waste

1. Transuranic waste is defined as a radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes (i.e. atomic number >92) per gram of waste with half-lives greater than 20 years

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(DOE Manual 435.1-1Chg 1, Radioactive Waste Management).

2. The generation of TRU waste is **strictly forbidden** until approval is granted by AL-ESH&A and the DOE Ames Site Office. Any activity that will or potentially generate TRU waste must go through the readiness review procedure where explicit directions and standard operating procedures shall outline the proper collection, packaging and disposal path of the TRU waste.

6.5.4 Mixed Waste

1. Since mixed waste contains both chemical and radioactive components, it shall be properly identified using the following definitions.

Hazardous waste is defined and shall be identified as a characteristic or as a listed waste. Refer to the Hazardous Waste Management Procedure (10200.047), Section 5.2, for a complete description of hazardous waste identification. Refer to the Radioactive Waste Management Procedure (10200.048), Section 6.0, for a complete description of radioactive waste identification.

2. Generation of mixed waste is strictly forbidden until approval is granted by AL-ESH&A and the DOE Ames Site Office, if there is no disposal path for the waste. Any activity that will or potentially generate mixed waste must go through the readiness review procedure where explicit directions and standard operating procedures shall outline the proper collection, packaging and disposal path.

6.6 Labeling Requirements

All known radioactive waste, at a minimum, must be labeled "CAUTION RADIOACTIVE WASTE".

- Labels should have a yellow background with magenta or black standard radiation symbol. Lettering shall also be black or magenta, with magenta being preferred.

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- Labels shall include contact radiation levels, removable surface contamination levels (specified as alpha or beta-gamma), dates surveyed, surveyor's name, and a description of contained radionuclides with their respective concentrations.

For further information on labeling, including radioactive wastes that are not subject to these labeling requirements, contact ESH&A Health Physics (4-2153).

6.7 Radioactive/Mixed Waste Acceptance Form & Waste Pick-ups

The acceptance form is required for radioactive waste and shall be completed with the assistance of Health Physics personnel. Contact ESH&A (4-2153) for pick-up and/or questions.

An example of a properly completed acceptance form can be found in Appendix D.

6.8 Waste Minimization/Pollution Prevention & Affirmative Procurement

The following guidelines for WMin/P2 & AP for radioactive waste management should be considered in any process that may generate radioactive waste.

- Restrict all materials in Radiological Buffer Areas to strictly those needed for performance of work.
- Segregate known uncontaminated from potentially contaminated waste.
- Use the least toxic material available to perform a process.
- Purchase the least amount of material/chemical that is necessary to complete the project.

For more information on waste minimization and pollution prevention please see the Laboratory's "Waste Minimization/Pollution Prevention Plan" which can be found on the Laboratory's web page under ESH&A or contact ESH&A for a copy.

6.9 Spill Response

Accidental release of chemicals occasionally occurs as a result of spills, leaks, etc. When spills happen there is the potential for harmful effects. Contingency planning can minimize potential problems and enhance personnel's ability to deal with routine spills effectively. Group Leaders/Department Managers and/or Supervisors are responsible for developing a "site specific"

contingency plan for their locations and for training personnel under their supervision.

Ames Laboratory has set the following criteria for reporting and cleaning-up spills.

- All radiological spills must be reported to ESH&A (4-2153). Generators may clean up provided they have sufficient training and equipment to do so.
- Releases of more than 4 liters, Plant Protection shall be notified immediately (4-5511), and they will initiate the appropriate response.
- ESH&A Health Physics personnel will survey the area to verify there is no contamination present.

APPENDIX A

Definitions

Affirmative Procurement (AP) - practices which encourage the development of economically efficient markets for products manufactured with recycled materials.

Cost-effective - one of the mandates for remedial actions. It requires a close evaluation of the costs required to implement and maintain a remedy. The selection of protective remedies whose costs are proportional to their overall effectiveness.

Environmental Protection Agency (EPA) – principle role of the EPA is to establish and enforce environmental protection standards.

Hazardous waste - a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may -

- a. Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness.
- b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Line management - responsibility that begins with the employee's immediate supervisor and extends upward through the line organization to the Laboratory Director.

Mixed waste - waste which contains a hazardous and a radioactive component.

Resource Conservation and Recovery Act (RCRA) – governs the generation, storage, treatment, transportation and disposal of hazardous waste.

Pollution prevention (P2) - the use of any process, practice or product that reduces or eliminates the generation and release of pollutants, hazardous substances, contaminants, and wastes, including those which protect natural resources through conservation or more efficient utilization.

Radioactive waste - For the purpose of this manual, radioactive waste is any unwanted or discarded material, equipment or system component determined to be contaminated by a radionuclide.

Research Waste Assessments - identify the nature and amount of waste generated from research operations. Ames Laboratory will assess the research operations and procedures to improve processes and to promote waste minimization.

Resource conservation - includes practices that increase the efficiency and/or reduce the use of hazardous materials, energy, water or other resources.

Toxic pollutants - substances which are harmful or deadly at low concentrations; any component listed in 40 CFR 261.

Unbound Nano Particle (UNP) Waste – are engineered materials containing nanoparticles between 1-100 nanometers and are not contained within a matrix that would be expected to prevent the particles from being separately mobile and a potential source of exposure. An engineered nanoscale particle dispersed and fixed within a polymer matrix, incapable as a practical matter of becoming airborne, would be “bound”.

Upper management - includes the Laboratory, Associate and Program Directors.

Waste – for the purpose of this manual the word “waste” includes hazardous, radioactive and mixed wastes as they are defined in the Waste Management Program Manual.

Waste generator - anyone who produces any form of waste.

Waste minimization - an action that avoids or reduces the generation of waste by source reduction, improved energy usage, or by recycling. This action will be consistent with the general goal of minimizing present and future threats to human health, safety, and the environment.

APPENDIX B

Hazardous Waste Label Example

**HAZARDOUS WASTE
AMES LABORATORY**

GROUP: MPC / Jones
BLDG: MD ROOM: 304
CONTAINER I.D.: LJ 103
START DATE: 10-20-08
CLOSURE DATE: 01-16-09

For ESH&A
Use Only

Hazardous Properties: Check all that apply.

<input checked="" type="checkbox"/> Toxic	<input type="checkbox"/> Reactive
<input type="checkbox"/> Corrosive	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Ignitable	

CHEMICAL NAME	QUANTITY (wt/vol)	DATE
<u>Sulfuric Acid</u>	<u>90%</u>	
<u>Water</u>	<u>10%</u>	
<u>Lead - trace</u>		

Do not mix hazardous waste with non-hazardous waste.
Do not mix hazardous waste with radioactive waste.
Do not mix inorganic waste with organic waste.
Do not mix halogenated solvents with other solvents.
Store in a designated location with secondary containment.
Keep non-compatible chemicals separated during storage.
Contact ESH&A at 4-9277 or 4-2153 for disposal.

APPENDIX C

Hazardous Waste Acceptance Form Example

Example Page 1 of 1
Form #: 10200.110 Rev. 5

Hazardous Waste Acceptance Form
Please Print

Ames Laboratory
Environment, Safety, Health & Assurance
EPA Waste Number: IA6890008950

Pick-ups & Questions Call:
Dan Kayser : 294-7923
ESH&A Office: 294-2153

(1) Container ID Number	(2) Employee Number(s)	(3) Chemical Description (Mixtures - Please list all components with approximate percentages)	(4) Total Quantity/Container Kg or L	(5) Special Handling	(6) ESH&A Use only Barcode ID
LJ 103	99999	Sulfuric Acid 90% Water 10% Lead trace amount %	2L		
LJ 104	99999	Hydrochloric Acid 50% Hexane 50% Trace of silver %	2L		

(7) Hazardous Characteristics	Yes	Applicable Container Number
Ignitibility: Is the flashpoint less than 140° F (60°C)?	✓	LJ 104
Corrosivity: Is the pH less than or equal to 2, or greater than or equal to 12.5?	✓	LJ 103, LJ 104
Reactivity: Is the waste normally unstable, water reactive, or explosive? Which? Will the waste liberate cyanide or sulfide? If so, which?		
Toxicity: Based on your knowledge of the process and the information available (MSDS, manufacturer specifications) to you, does the waste contain any of the following materials? (TCLP list) (Please circle all the chemicals contained in the waste.)	✓	LJ 103 LJ 104
Is the waste an Oxidizer?		
Contains engineered nano particles 1-100 nanometers in size?		

TCLP List

<p>Metals</p> <ul style="list-style-type: none"> Arsenic Barium Cadmium Chromium <u>Lead</u> Mercury <u>Silver</u> Selenium 	<p>Pesticides</p> <ul style="list-style-type: none"> Chlordane 2,4-D Endrin Heptachlor Lindane Methoxychlor 	<p>Chlorinated Solvents</p> <ul style="list-style-type: none"> Pentachlorophenol Toxaphene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2,4,5-TP(Silvex) Carbon Tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethylene 	<p>Organic Solvents</p> <ul style="list-style-type: none"> Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Tetrachloroethylene Vinyl Chloride Benzene Cresol & Isomers Methyl Ethyl Ketone 2,4-Dinitrotoluene Nitrobenzene Pyridine
--	--	---	--

(8) Chemical Waste Statement

I certify to the best of my knowledge that the information provided above is true and complete. Based upon my knowledge of the origin, storage, and handling of the waste, I certify that radioactivity HAS NOT been added. I also certify that I am minimizing all waste generated to the best of my ability.

Print Name: George Smith

Group/Project: MPC / Jones

Signature: _____

Location of Waste: 304 Metals

Date: 1/16/09

Telephone #: 4-9999

Form 10200.110 Rev 5 Effective Date 1-16-09

http://www.external.ameslab.gov/csha/ESH&A_Documents/formlist.html

APPENDIX C (cont)

Hazardous Waste Acceptance Form Example

ESH&A HAZARDOUS WASTE PICK-UP

General Comments:

1. Good housekeeping should apply to your waste chemicals as well as your new ones. The bottles should be clean, not streaked with spilled chemical wastes.
2. Segregate your waste by compatibility and reactivity for general lab safety.
3. Provide secondary containment in your satellite accumulation area for all liquid waste.
4. Avoid overstocking of new chemicals and the accumulation of waste and or unused chemicals.

The Waste Container Should be:

1. Of an adequate and appropriate size for the volume of waste.
2. Of a composition suitable for handling, storing, and transporting your particular waste.
3. One that can be and is properly sealed. Please, no cracked lids, no glass or rubber stoppers.
4. Identified and numbered with a permanent label that has the words "HAZARDOUS WASTE". Labels are available from ESH&A at G40 TASF.
5. Filled to a safe level; please leave head space for expansion.
6. Provide containment for single and or multiple piece miscellaneous solids, eg. waste mercury batteries or discarded glassware should be enclosed in a plastic bag or jar with a completed "HAZARDOUS WASTE" label attached.
7. The waste label should have start and close dates including the year.

Instructions For Completing the "HAZARDOUS WASTE ACCEPTANCE FORM"

Section (1) Container ID Number

The container ID number should have a unique letter-number combination. This number should be your group leader's initials plus a three digit number starting with 001 and continuing in sequence 002, etc (eg. Jim Withers would be JW001, JW002, etc.).

Section (2) Employee Number

List the employee number of the person who **GENERATED** the waste.

Section (3) Chemical Description

List the waste components by their **CHEMICAL NAME**, not by formula or shorthand. Example: tetrahydrofuran not THF or C₄H₈O.

Section (4) Total Quantity/Container Kg or L

List the total volume of the container in liters or total weight in kilograms.

Section (5) Special Handling

List any special handling that is necessary for the safe removal, storage, and disposal. Example: carcinogen, flammable, corrosive, etc.

Section (6) ESH&A Use Only Barcode ID

This section is for ESH&A to use.

Section (7) Hazardous Characteristics

List any of the hazardous characteristics of each container of waste.

Section (8) Chemical Waste Statement

Read the statement, fill in all the blanks and sign the statement.

Additional information and examples of completed forms can be found in the Waste Management Program Manual at:

http://www.external.ameslab.gov/esh/ESH&A_Documents/Manuallist.html

APPENDIX D

Radioactive Waste Acceptance Form Example

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Example

Page 1 of 1
Form #10200.107 Rev. 4, 10/31/07

Radioactive Waste Acceptance Form

(To be completed with ESH&A Health Physics Personnel)
Please Print

Ames Laboratory
Environment, Safety, Health & Assurance

(1) ESH&A CIN	(2) Employee Number	(3) Radioactive Waste Description	(4) Activity/isotope uCi/g	(5) Analysis Method(s)	(6) Quantity (kg or L)	(7) Staging Area
99999	9999	Thorium/Uranium water solution	Analytical Attached	Gamma Spec.	0.25L	

9) Generators Certification

Does the waste contain any material that exhibits any EPA Hazardous Characteristics? (ignitability, corrosivity, reactivity, or toxicity). YES _____ NO ✓

If yes which container number(s): _____

Generators Name: Jim Smith Location of Waste: Rm. 145 Metals

Signature: _____ Date: 1/16/09 Group/Project: Smith

ESH&A: Analytical Attached Analytical on File (G40 TASF)

10) Health Physics Personnel to Complete:

Analyzed By: George Jones Date: 1/16/09

Signature: _____

Special Handling Procedures: Water solution w/ thorium + uranium isotopes

APPENDIX D (cont)

Radioactive Waste Acceptance Form Example

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Radioactive Waste Acceptance Form

General Comments:

1. This document is to be completed with the assistance of the Ames Laboratory Health Physics Personnel. Call ESH&A at 4-2153.
2. Generators shall follow Radioactive Waste Procedures (10200.048 & 049) located in the Ames Laboratory Waste Management Program Manual.(10200.003).
3. All radioactive waste shall be segregated. No mixing of chemicals or chemical waste shall take place without prior approval from ESH&A.

Instructions For Completing the "RADIOACTIVE WASTE ACCEPTANCE FORM"

Section (1) ESH&A Barcode

The Ames Laboratory Chemical Safety Technician or Environmental Specialist will assign a unique ESH&A CIN to each container. Each container will be tracked in the Laboratory's Waste Tracking System. CINs are generated from a printer maintained by ESH&A in G40 TASF. A CIN WILL NOT BE ASSIGNED UNTIL STEPS 1-6 and 9-10 HAVE BEEN COMPLETED.

Section (2) Employee Number

List the employee number of the person who **GENERATED** the waste.

Section (3) Radioactive Waste Description

List the waste components and process generating the waste. Provide approximate area for ductwork, equipment etc.

Example: Smears and latex gloves from health physics QA/QC support activities.

Example: Discarded duct work (4'Lx2'x2') from fume hood up grade. Contaminated from past thorium/uranium research activities.

Section (4) Activity/Isotope (uCi/g)

ESH&A Health Physicist or Health Physicist Technician will fill in this section. Enter each isotope and the activity level in uCi/g. If analytical is attached you may enter "**analytical attached**".

Section (5) Analysis Method(s) Quantity (kg or L)

ESH&A Health Physicist or Health Physicist Technician will fill in this section. Indicate each type of method used to characterize the radioactive waste (i.e. Gamma Spec, Field instrumentation and calculation).

Section (6) Quantity (kg or L)

Fill in total quantity of waste in kilograms or liters.

Section (7) Staging Area

The Ames Laboratory Chemical Safety Technician, Health Physics personnel, or Environmental Specialist will place the container(s) in the appropriate drum and/or designated storage area(s). A CIN **MUST BE ASSIGNED BEFORE MOVING WASTE TO STAGING AREA AND/OR DRUM.**

Example: SCO I drum B56A, LSA- B56A, B56A or WHF.

Section (9) Generators Certification

Generator will then print, sign and date the form certifying the contents of their waste container.

Section (10) ESH&A

Health Physicist or Health Physicist Technician print, sign and date when waste was analyzed. Any special precautions and/or handling procedures should also be indicated.

APPENDIX E

ACCUTE ("P" Listed) EPA Listed Wastes (40 CFR Part 261.33)

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
P203	1646-88-4	Aldicarb sulfone
P070	116-06-3	Aldicarb
P004	309-00-2	Aldrin
P005	107-18-6	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 picarate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate(1-),bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H ₃ As ₂ O ₄
P012	1327-53-3	Arsenic oxide As ₂ O ₃
P011	1303-28-2	Arsenic oxide As ₂ O 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)

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P046	122-09-8	Benzeneethanamine, alpha, alpha-dimethyl
P014	108-98-5	Benzenethiol
P127	1563-66-2	7-Benzofuranol, 2,3-dihydro-2,2-dimethylmethyl-carbamate
P188	57-64-7	Benzoic acid, 2-hydroxy-, cpmpd, with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo [2,3-b]indo 1-5-yl methylcarbamate ester (1:1)
P001	~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-[methyl amino) carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide Ca(CN) ₂
P189	55285-14-8	Carbamic acid, [(dibutylamino)-thio]methyl-2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester
P191	644-64-4	Carbamic acid, dimethyl-, 1-[dimethyl-amino) carbonyl]-5-methyl-1H-pyrazol-3-yl ester,
P192	119-38-0	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl) -1H-pyrazol-5-yl ester
P190	1129-41-5	Carbamic acid, methyl-, 3-methylphenyl ester
P127	1563-66-2	Carbofuran
P022	75-15-0	Carbon disulfide
P095	755-44-5	Carbonic dichloride
P189	55285-14-8	Carbosulfan
P023	107-20-0	Chloroacetaldehyde

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
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)
P202	64-00-6	m-Cumenyl methylcarbamate
P030	_____	Cyanides (soluble cyanide salts), not otherwise Specified
P031	460-19-5	Cyanogen
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-(1 alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1 alpha, 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)-

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P051	~72-20-8	2,7:3,6-Dimethyanonaphth[2,3b]oxirene 3,4,5,6,9,9-Hexachloro- 1a,2,2a,3,6,6a,7,7a octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7abeta,7aalpha)-, & metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P191	644-64-4	Dimetilan
P047	~534-52-1	4,6-Dinitro-o-cresol, & salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramidate, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-04-4	Disulfoton
P049	541-53-7	Dithiobiuret
P185	26419-73-8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-O-[(methylamino)-carbonyl]oxime
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
P194	23135-22-0	Ethanimidothioc acid, 2-(dimethylamino)-N-[[[(methylamino) carbonyl]oxy]-2-oxo-,methyl ester
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

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P058	62-74-8	Fluoroacetic acid, sodium salt
P065	628-86-4	Fluminic acid, mercury(2+) satl (R,T)
P197	17702-57-7	Formparanate
P198	23422-53-9	Formetanate hydrochloride
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
P192	119-38-0	Isolan
P202	64-00-6	3-Isopropylphenyl N-methylcarbamate
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P196	15339-36-3	Manganese bis(dimethylcabamodithioato-S,S')-,
P196	15339-36-3	Manganese dimethyldithiocarbamate
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P198	23422-53-9	Methanimidamide, N,N-dimethyl-N'-[3-[(methylamino)-carbonyl]oxyl]phenyl]-, monohydrochloride
P197	17702-57-7	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[(methylamino)carbonyl]oxy]phenyl]-
P199	2032-65-7	Methiocarb
P082	62-75-9	Methanamine, 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-

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-Hexachloro-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-Methylactonitrile
P071	298-00-0	Methyl parathion
P190	1129-41-5	Metolcarb
P199	2032-65-7	Mexacarbate
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
P075	54-11-5	Nicotine, & 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	Octamethylpyrophosphoramidate
P087	20816-12-0	Osmium oxide OsO ₄ , (T-4)-
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P194	23135-22-0	Oxamyl
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P128	315-18-4	Phenol, 4-(dimethylamino)-3,5-dimethyl-methylcarbamate (ester)
P199	2032-65-7	Phenol, (3,5-dimethyl-4-(methylthio)-,methyl-carbamate
P048	51-28-5	Phenol, 2-4-dinitro-
P047	534-52-1	Phenol, 2-methyl-4,6-dinitro-, & salts
P202	64-00-6	Phenol, 3-(1-methylethyl)-,methyl carbamate
P201	2631-37-0	Phenol, 3-methyl-5-(1-methylethyl)- methyl carbamate
P009	88-85-7	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)ethyl] ester
P094	298-02-2	Phosphorofluoridic acid, bis(1-methyl-ethyl)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
P071	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P204	57-47-6	Physostigmine
P188	57-64-7	Physostigmine salicylate
P110	78-00-2	Plumbane, tetraethyl
P201	2631-37-0	Promecarb
P203	1646-88-4	Propanal, 2-methyl-w-(methyl-sulfonyl)-O-[(methylamino)carbonyl] oxime
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)carbonyl]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	107-19-7	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	4-Pyridinamine
P075	~54-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-(S)-, & salts
P204	57-47-6	Pyrrolo[2,3-b]indol-5-oid, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-
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

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P106	143-33-9	Sodium cyanide Na(CN)
P108	~57-24-9	Strychnidin-10-one, & salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	~57-24-9	Strychnine & 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-
P185	26419-73-8	Tirpate
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, & salts, when present at concentrations greater than 0.3%

APPENDIX E (cont)

ACUTE ("P" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
P205	137-30-4	Zinc, bix(dimethylcarbamodithioato-S,S')-
P121	557-21-1	Zinc cyanide
P121	557-21-1	Zinc cyanide $Zn(CN)_2$
P122	137-30-4	Zinc phosphide Zn_3P_2 , when present at concentration greater than 10% (R,T)
P205	137-30-4	Ziram

~ CAS Number given for parent compound only

(T) = Toxicity
(R) = Reactivity
(I) = Ignitability
(C) = Corrosivity

APPENDIX F

TOXIC ("U" Listed) EPA Listed Wastes (40 CFR Part 261.33)

Hazardous Waste No.	Chemical Abstracts No.	Substance
U394	30558-43-1	A2213
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-
U240	~94-75-7	Acetic acid, (2,4-dichlorophen-oxy)- salts & esters
U112	141-78-6	Acetic acid, ethyl ester (I)
U144	301-04-2	Acetic acid, lead (2+) salt
U214	563-68-8	Acetic acid, thallium(1+) salt
See		
F027	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid (I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U136	75-60-5	Arsinic-acid, dimethyl
U014	492-80-8	Auramine
U015	115-02-06	Azaserine
U365	2212-67-1	H-Azepine-1-carbothioic acid, hexahydro-S-ethyl ester
U010	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[[(aminocarbonyl)oxy]methyl]-1,1a, 2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-[1aS-(1aalpha,8beta,8aalpha,8balpha)]-

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U280	101-27-9	Barban
U278	22781-23-3	Bendiocarb
U364	22961-82-6	Bendiocarb phenol
U271	17804-35-2	Benomyl
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	25-51-4	Benz[c]acridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis [N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-, hydrochloride
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U019	71-43-2	Benzene (I, T)
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethyl-hexyl)ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	75-54-8	Benzene, 1,1'-(2,2-dichloroethylidene) bis(4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl- (I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-2,4-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro-
U183	608-93-5	Benzene, pentachloro
U185	82-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U207	95-94-3	Benzene, 1,2,3,4-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene) bis(4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis (4-methoxy-
U023	98-07-7	Benzene, (trichloromethyl)-
U234	99-35-4	Benzene, 1,3,5-trinitro-
U021	92-87-5	Benzidine
U202	~81-07-2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U278	22781-23-3	1,3-Benzodioxol-4-ol, 2,2-dimethyl methyl carbamate
U364	22961-82-6	1,3-Benzodioxol-4-ol, 2,2-dimethyl-
U203	94-59-7	1,3-Benzodioxole, 5-(2 propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1 propenyl)-

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U367	1563-38-8	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-
U064	189-55-9	Benzo[rst]pentaphene
U248	~81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations of 0.3% or less
U022	50-32-8	Benzo(a)pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
U073	92-94-1	[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine,3,3'dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine,3,3'dimethyl-
U401	97-74-5	Bis(dimethylthiocarbamoyl) sulfide
U400	120-54-7	Bis(pentamethylene)thiuram tetrasulfide
U225	75-25-2	Bromoform
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4-hexachloro-
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7[[[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy) methyl]-2,3,5,7a-tetrahydro-1H-prrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*, 3R*), 7aalpha)]-
U031	71-36-3	n-Butyl alcohol (I)
U392	2008-41-5	Butylate
U136	75-60-5	Cacodylic acid

APPENDIX F (cont)

TOXIC (“U” Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U032	13765-19-0	Calcium chromate
U372	10605-21-7	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester
U271	17804-35-2	Carbamic acid, [1-(butylamino)carbonyl-1H-benzimidazol-2-yl], methyl ester
U375	55406-53-6	Carbamic acid, butyl-, 3-iodo-2-propynyl ester
U280	101-27-9	Carbamic acid, (3-chlorophenyl) 4 chloro-2-butynyl ester
U373	122-42-9	Carbamic acid, phenyl-, 1-methylethyl ester
U409	23564-05-8	Carbamic acid,[1,2-phenylenebis(iminocarbonothioyl)] bis-, dimethyl ester
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	111-54-6	Carbamodithioic acid, 1,2-ethanediy-bis-, salts & esters
U378	51026-28-9	Carbamodithioic acid, (hydroxymethyl)methyl-monopotassium salt
U384	137-42-8	Carbamodithioic acid, methyl-, monosodium salt
U377	137-41-7	Carbamodithioic acid, methyl-, monopotassium salt
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester
U389	2303-17-5	Carbamothioic acid, bis(1-methylethyl)-S-(2,3,3-trichloro-2-propenyl) ester
U392	2008-41-5	Carbamothioic acid, bis (2-methylpropyl)-, S-ethyl ester
U391	1114-71-2	Carbamothioic acid, butylethyl-, S-propyl ester
U386	1134-23-2	Carbamothioic acid, cyclohexylethyl-, S-ethyl ester
U390	759-94-4	Carbamothioic acid, dipropyl-, S-ethyl ester
U387	52888-80-9	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester
U379	136-30-1	Carbamodithioic acid, dibutyl, sodium salt

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U277	95-06-7	Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester
U381	148-18-5	Carbamodithioic acid, diethyl-, sodium salt
U383	128-03-0	Carbamodithioic acid, dimethyl, potassium salt
U382	128-04-01	Carbamodithioic acid, dimethyl-, sodium salt
U376	144-34-3	Carbamodithioic acid, dimethyl-, tetraanhydrosulfide with orthothioselenious acid
U385	1929-77-7	Carbamothioic acid, dipropyl-, S-propyl ester
U279	63-25-2	Carbaryl
U372	10605-21-7	Carbendazim
U367	1563-38-8	Carbofuran phenol
U215	6533-73-9	Carbonic acid, dithallium (1+) salt
U033	353-50-4	Carbon oxyfluoride (R,T)
U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	57-74-9	Chlordane, alpha & gamma isomers
U026	494-03-1	Chlornaphazin
U037	108-90-7	Chlorobenzene
U038	510-15-6	Chlorobenzilate
U039	59-50-7	p-Chloro-m-cresol
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid H ₂ CrO ₄ , calcium salt
U050	218-01-9	Chrysene
U393	137-29-1	Copper, bix(dimethylcarbamodithioato-S,S')-,
U393	137-29-1	Copper dimethyldithiocarbamate

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U051		Cresote
U052	1391-77-3	Cresol (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide (CN) Br
U386	1134-23-2	Cycloate
U197	106-51-4	2,5-Cyclohexadiene- 1,4-dione
U056	110-82-7	Cyclohexane (I)
U129	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1 alpha, 2alpha, 3beta, 4alpha, 5alpha, 6beta)-
U057	108-94-1	Cyclohexanone (I)
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	50-18-0	Cyclophosphamide
U240	~94-75-7	2,4-D, salts & esters
U059	20830-81-3	Daunomycin
U366	533-74-4	Dazomet
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz[a,h]anthracene
U064	189-55-9	Dibenzo[a,i]pyrene
U066	96-12-8	1,2-Dibromo-3-chloropropane
U069	84-74-2	Dibutyl phthalate
U070	95-50-1	o-Dichlorobenzene
U071	541-73-1	m-Dichlorobenzene
U072	106-46-7	p-Dichlorobenzene
U073	91-94-1	3,3'-Dichlorobenzidine
U074	764-41-0	1,4-Dichloro-2 butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U078	75-35-4	1,1-Dichloroethylene
U079	156-60-5	1,2-Dichloroethylene

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U025	111-44-4	Dichloroethyl ether
U027	108-60-1	Dichloroisopropyl ether
U024	111-01-1	Dichloro-methoxy ethane
U081	120-83-2	2,4-Dichlorophenol
U082	87-65-0	2,6- Dichlorophenol
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U395	5952-26-1	Diethylene glycol, dicarbamate
U108	123-91-1	1,4-Diethyleneoxide
U028	117-81-7	Diethylhexyl phthalate
U086	1615-80-1	N,N'-Diethylhydrazine
U087	3288-58-2	O,O-Diethyl S-methyl dithiophosphate
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstilbesterol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	124-40-3	Dimethylamine (I)
U093	60-11-7	p-Dimethylaminoazobenzene
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-90-4	3,3'-Dimethylbenzidine
U096	80-15-9	alpha,alpha-Dimethylbenzyl-hydroperoxide (R)
U097	79-44-7	Dimethylcarbamoyl
U098	57-14-7	1,1-Dimethylhydrazine
U099	540-73-8	1,2-Dimethylhydrazine
U101	105-67-9	2,4-Dimethylphenol
U102	131-11-3	Dimethyl phthalate
U103	77-78-1	Dimethyl sulfate
U105	121-14-2	2,4-Dinitrotoluene
U106	606-20-2	2,6-Dinitrotoluene
U107	117-84-0	Di n-octyl phthalate
U108	123-91-1	1,4-Dioxane

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U109	122-66-7	1,2-Diphenylhydrazine
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n-propylnitrosamine
U403	97-77-8	Disulfiram
U041	106-89-8	Epichlorohydrin
U390	759-94-4	EPTC
U001	75-07-0	Ethanal (I)
U404	101-44-8	Ethanamine, N,N-diethyl-
U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U155	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U067	106-93-4	Ethane, 1,2-dibromo-
U076	75-34-3	Ethane, 1,1-dichloro-
U077	107-06-2	Ethane, 1,2-dichloro-
U131	67-72-1	Ethane, hexachloro-
U410	59669-26-0	Ethanimidothioic acid, N,N'-[thiobis[(methylimino)carbonyl]oxy]]bis-, dimethyl ester
U394	30558-34-1	Ethanimidothioic acid, 2-(dimethylamino)carbonyl-N-hydroxy-2-oxo-, methyl ester
U024	11-91-1	Ethane, 1,1'-[methylenebis(oxybis[2-chloro-
U117	60-29-7	Ethane, 1,1'-oxybis- (I)
U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U184	76-01-7	Ethane, pentachloro-
U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U218	62-55-5	Ethanethioamide
U226	71-55-6	Ethane, 1,1,1-trichloro-
U227	79-00-5	Ethane, 1,1,2-trichloro-
U359	110-80-5	Ethanol, 2-ethoxy
U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U395	5952-26-1	Ethanol, 2,2'-oxybis-, dicarbamate

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U004	98-86-2	Ethanone, 1-phenyl-
U043	75-01-4	Ethene, chloro-
U042	110-75-8	Ethene, (2-chloroethoxy)-
U078	75-35-4	Ethene, 1,1-dichloro-
U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U210	127-18-4	Ethene, tetrachloro
U228	79-01-6	Ethene, trichloro
U112	141-78-6	Ethyl acetate (I)
U113	140-88-5	Ethyl acrylate
U238	51-79-6	Ethyl carbamate (urethane)
U117	60-29-7	Ethyl ether (I)
U114	~111-54-6	Ethylenebisdithiocarbamic acid, salts & esters
U067	106-93-4	Ethylene dibromide
U077	107-06-2	Ethylene dichloride
U359	110-80-5	Ethylene glycol monoethyl ether
U115	75-21-8	Ethylene oxide (I,T)
U116	96-45-7	Ethylenethiourea
U076	75-34-3	Ethylidene dichloride
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethyl methanesulfonate
U407	14324-55-1	Ethyl Ziram
U396	14484-64-1	Ferbam
U120	206-44-0	Fluoranthene
U122	50-00-0	Formaldehyde
U123	64-18-6	Formic acid (C, T)
U124	110-00-9	Furan (I)
U125	98-01-1	Furfural (I)
U147	108-31-6	2,5-Furandione
U213	109-99-9	Furan, tetrahydro- (I)
U125	98-01-1	2-Furan carboxaldehyde (I)
U124	110-00-9	Furfuran (I)

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U206	18883-66-4	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-D-
U206	18883-66-4	D-Glucose, 2-deoxy-2-[[methyl-nitrosoamino]-carbonyl]amino]-
U126	765-34-4	Glycidylaldehyde
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U130	77-47-4	Hexachlorocyclopentadiene
U131	67-72-1	Hexachloroethane
U132	70-30-4	Hexachlorophene
U243	1888-71-7	Hexachloropropene
U133	302-01-2	Hydrazine (R, T)
U086	1615-80-1	Hydrazine, 1,2-diethyl-
U098	57-14-7	Hydrazine, 1,1-dimethyl-
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U109	122-66-7	Hydrazine, 1,2-diphenyl-
U134	7664-39-3	Hydrofluoric acid (C, T)
U134	7664-39-3	Hydrogen fluoride (C, T)
U135	7783-06-4	Hydrogen sulfide
U135	7783-06-4	Hydrogen sulfide H ₂ S
U096	80-15-9	Hydroperoxide, 1-methyl 1-phenylethyl- (R)
U116	96-45-7	2-Imidazolidinethione
U137	193-39-5	Indeno[1,2,3-cd]pyrene
U375	55406-53-6	3-Iodo-2-propynyl n-butylcarbamate
U396	14484-64-1	Iron, tris(dimethylcarbamodithioato-S,S')-,
U190	85-44-9	1,3-Isobenzofurandione
U140	78-83-1	Isobutyl alcohol (I, T)
U141	120-58-1	Isosafrole
U142	143-50-0	Kepone
U143	303-34-4	Lasiocarpine

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U144	301-04-2	Lead acetate
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U129	58-89-9	Lindane
U163	70-25-7	MNNG
U147	108-31-6	Maleic anhydride
U148	123-33-1	Maleic hydrazine
U149	109-77-3	Malononitrile (I, T)
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U384	137-42-8	Metham Sodium
U152	126-98-7	Methacrylonitrile (I, T)
U092	124-40-3	Methanamine, N -methyl- (I)
U029	74-83-9	Methane, Bromo-
U045	74-87-3	Methyl chloride (I, T)
U156	79-22-1	Methyl chlorocarbonate (I, T)
U226	71-55-6	Methyl chloroform
U157	56-49-5	3-Methylchloranthrene
U158	101-14-4	4,4'-Methylenebis(2-chloraniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK) (I, T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R, T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I, T)
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	methylthiouracil
U010	50-07-7	Mitomycin C
U365	2212-67-1	Molinate

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U059	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranos) oxyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U167	134-32-7	1-Naphthalenamine
U168	91-59-8	2-Naphthalenamine
U026	494-03-1	Naphthalenamine, NN'-bis(2-chloroethyl)-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl [1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-tetrasodium salt
U279	63-25-2	1-Naphthalenol, methylcarbamate
U166	130-15-4	1,4-Naphthoquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U217	10102-454-1	Nitric acid, thallium (1+) salt
U169	98-95-3	Nitrobenzene (I, T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropane (I, T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitrosodiethylamine
U178	615-53-2	N-Notroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-2	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane,2,2-dioxide

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U058	50-18-0	2H-1,3,2-Oxazaphosphosphorin-2-amine, N,N-bis (2-chloroethyl) tetrahydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)
U126	765-34-4	Oxiranecarboxyaldehyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U391	1114-71-2	Pebulate
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
See		
F027	87-86-5	Pentachlorophenol
U161	108-10-1	Pentanol, 4-methyl-
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U039	59-50-7	Phenol, 4-chloro-3-methyl
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1, 2-ethenediyl)bis-, (E)-
U101	105-67-9	Phenol, methyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U411	114-26-1	Phenol, 2-(1methylethoxy)-, methylcarbamate
U170	100-02-7	Phenol, 4nitro-
See		
F027	87-86-5	Phenol, pentachloro-
See		
F027	58-90-2	Phenol, 2,3,4,6-tetrachloro-

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
See F027	95-95-4	Phenol, 2,4,5-trichloro-
See F027	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	7446-27-7	Phosphoric acid, lead(2+) salt (2:3)
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U189	1314-80-3	Phosphorous sulfide (R)
U190	85-44-9	Phthalic anhydride
U191	109-06-8	2-Picoline
U179	100-75-4	Piperdine, 1-nitroso-
U400	120-54-7	Piperdine, 1,1'-(tetrathiodicarbonothioy)-bis-
U383	128-03-0	Potassium dimethyldithiocarbamate
U378	51026-28-9	Potassium n-hydroxymethyl-n-methyldi-thiocarbamate
U377	137-41-7	Potassium n-methyldithiocarbamate
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I, T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U083	78-87-5	Propane, 1,2-dichloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I, T)
U027	108-60-1	Propane,2,2'-oxybis[2-chloro-
U193	1120-71-4	1,3-Propane sultone
See F027	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U235	126-72-7	1-Propanol, 2,3-dibromo-phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U002	67-64-1	2-Propanone (I)
U007	79-06-1	2-Propenamide

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U084	542-75-6	1-Propene, 1,3-dichloro-
U243	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	107-13-1	2-Propenenitrile
U152	126-98-7	2-Propenenitrile, 2-methyl- (I,T)
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U373	112-42-9	Propham
U411	114-26-1	Propoxur
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U387	52888-80-9	Prosulfocarb
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4-(1H,3H)-Pyrimidinone, 5-[bis(2-chloroethyl)amino]
U164	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine
U201	108-46-3	Resorcinol
U202	~81-07-2	Saccharin, & salts
U203	94-59-7	Safrole
U204	7783-00-8	Selenious acid
U204	7783-00-8	Selenium dioxide
U205	7488-56-4	Selenium sulfide
U205	7488-56-4	Selenium sulfide SeS ₂ (R,T)
U376	144-34-3	Selenium, tetrakis(dimethyldithiocarbamate)
U015	115-02-6	L-Serine, diazoacetate (ester)
U379	136-30-1	Sodium dibutyldithiocarbamate
U381	148-18-5	Sodium diethyldithiocarbamate

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U382		Sodium dimethyldithiocarbamate
See		
F027	93-72-1	Silvex (2,4,5-TP)
U206	18883-66-4	Streptozotocin
U103	77-78-1	Sulfuric acid, dimethyl ester
U277	95-06-7	Sulfallate
U189	1314-80-3	Sulfur phosphide (R)
U402	1634-02-2	Tetrabutylthiuram disulfide
See		
F027	93-76-5	2,4,5-T
U207	95-94-3	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	1,1,1,2-Tetrachloroethane
U209	79-34-5	1,1,2,2-Tetrachloroethane
U210	127-18-4	Tetrachloroethylene
See		
F027	58-90-2	2,3,4,6-Tetrachlorophenol
U213	109-99-9	Tetrahydrofuran (I)
U401	97-74-5	Tetramethylthiuram momosulfide
U366	533-74-4	2H-1,3,5-Thiadiazine-2-thione, tetrahydro-3,5-dimethyl-
U214	563-68-8	Thallium (I) acetate
U215	6533-73-9	Thallium (I) carbonate
U216	7791-12-0	Thallium (I) chloride
U216	7791-12-0	Thallium chloride Ticl
U217	10102-45-1	Thallium (I) nitrate
U218	62-55-5	Thioacetamide
U410	59669-26-0	Thiodicarb
U153	74-93-1	Thiomethanol (I, T)
U402	1634-02-2	Thioperoxydicarbonic diamide, tetrabutyl
U403	97-77-8	Thioperoxydicarbonic diamide, tetraethyl

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U244	137-26-8	Thioperoxydicarbonic diamide [(H ₂ N)C(S)] ₂ S ₂ , tetramethyl-
U409	23564-05-8	Thiophanate-methyl
U219	62-56-6	H ₂ N Thiourea
U244	137-26-8	Thiram
U220	108-88-3	Toluene
U221	25367-45-8	Toluenediamine
U223	26471-62-5	Toluene diisocyanate (R, T)
U328	95-53-4	o-Toluidine
U353	106-49-0	p-Toluidine
U222	636-21-5	o-Toluidine hydrochloride
U389	2303-17-5	Triallate
U011	61-82-5	1H-1,2,4-Triazol-3-amine
U227	79-00-5	1,1,2-Trichloroethane
U228	79-01-6	Trichloroethylene
U121	75-69-4	Trichloromonofluoromethane
U404	101-44-8	Triethylamine
See		
F027	95-95-4	2,4,5-Trichlorophenol
See		
F027	88-06-2	2,4,6-Trichlorophenol
U234	99-35-4	1,3,5-Trinitrobenzene (R, T)
U182	123-63-7	1,3,5-Trioxane,2,4,6-trimethyl-
U235	126-72-7	Tris(2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U237	66-75-1	Uracil mustard
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U385	1929-77-7	Vemolate
U043	75-01-4	Vinyl chloride

APPENDIX F (cont)

TOXIC ("U" Listed) EPA Listed Wastes

Hazardous Waste No.	Chemical Abstracts No.	Substance
U248	~81-81-2	Warfarin, & salts, when present at concentrations of 0.3 % or less
U239	1330-20-7	Xylene (I)
U200	50-55-5	Yohimban-16-carboxylic acid, 11, 17-dimethoxy-18-[3,4,5-trimethoxybenzoyl]oxy]-, methyl ester, (3beta, 16beta, 17alpha, 18beta, 20alpha)-
U407	14324-55-1	Zinc, bis(diethylcarbamo-dithioato-S,S')
U249	1314-84-7	Zinc, phosphide Zn ₃ P ₂ , when present at concentrations of 10% or less

~ CAS Number given for parent compound only

(T) = Toxicity
(R) = Reactivity
(I) = Ignitability
(C) = Corrosivity

APPENDIX G

Toxicity Characteristic EPA Listed Wastes (TCLP) (40 CFR Part 261.24)

EPA HW No. ⁴ Level	Contaminant	CAS No. ²	Regulatory (mg/L)
D004	Arsenic	7440-338-2	5.0
D005	Barium	7440-338-2	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D007	Chromium	7440-47-3	5.0
D023	o-Cresol	95-48-7	4200.0
D024	m-Cresol	108-39-4	4200.0
D025	p-Cresol	106-44-5	4200.0
D026	Cresol		4200.0
D016	2,4-D	94-75-7	10.0
D027	1,4-Dichlorobenzene	106-46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	121-14-2	30.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	30.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0

APPENDIX G (cont)

Toxicity Characteristic EPA Listed Wastes (TCLP)

EPA HW No. ⁴ Level	Contaminant	CAS No. ²	Regulatory (mg/L)
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	35.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichloroethylene	79-01-6	0.5
D041	2,4,5-Trichlorophenol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0
D017	2,4,5-TP (Silvex)	93-72-1	1.0
D043	Vinyl Chloride	75-01-4	0.2

1 Hazardous waste number.

2 Chemical abstracts service number.

3 Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

4 If o-, m-, and p-Cresol concentrations cannot be differentiated the total cresol (D026) concentration is used. Regulatory level of total cresol is 200 mg/l