Hazardous Waste Management

University of Tennessee Safety Program EC-001

Document Contact: EHS-Environmental Compliance
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Purpose, Applicability, and Scope

Purpose - The purpose of this procedure is to provide a framework for those individuals on campus who generate or handle hazardous waste. Consult Title 40 Code of Federal Regulations or Environmental Health and Safety for additional information regarding hazardous waste.

Applicability – This shall apply to all students, staff and faculty on the Knoxville campus of the University of Tennessee.

Scope – This standard applies to all hazardous waste as defined below.

Abbreviations

DOT-Department of Transportation

EHS-Environmental Health and Safety

HAZWOPER-Hazardous Waste Operations and Emergency Response Standard

IATA- International Air Transportation Agency

RCRA-Resource Conservation and Recovery Act

SAA-Satellite Accumulation Area

TDEC-Tennessee Department of Environment and Conservation

Definitions

Hazardous Waste – The EPA defines hazardous waste as a material that no longer has an intended value with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous wastes can exist as liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides.

In regulatory terms, a RCRA hazardous waste is either a listed waste that appears on one of the four hazardous wastes lists (F-list, K-list, P-list, or U-list), and/or exhibits at least one of four characteristics—ignitability, corrosivity, reactivity, or toxicity. Hazardous waste is regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C, which is enforced by the EPA on a federal level, and by TDEC on a state level.

Roles and Responsibilities

The management of hazardous chemical waste at the University consists of the coordination and direction of the waste generated in hundreds of laboratories and other campus facilities. To manage this large volume effectively, it is necessary to use the services and technical expertise of Environmental Health and Safety

(EHS), faculty, and staff members. This section briefly describes the function of each group and its role in the hazardous chemical waste management program.

University Administration

The Chancellor of the University is responsible for the administration of policy pertaining to institutional safety and health-related matters. The chancellor oversees the administration of safety policies through the chain of authority within the institution, delegating to deans, department heads, principle investigators and supervisors the responsibility for ensuring safe work practices of those under their supervision and adherence to established policy and guidelines.

EHS

EHS is responsible for surveillance of all laboratory activities involving the use of toxic agents and all additional chemical and biological problem areas within the confines of the University. A list of staff members from EHS is available as Appendix A.

Specific duties of the department include:

- Monitor the implementation of the safety and health policies of the University.
- Design and improve disposal procedures for chemical waste materials.
- Prepare, submit, and maintain records, reports and manifests as required by government regulations.
- Prepare applications for state and federal permits to generate and properly dispose of hazardous chemical waste.
- Schedule and co-ordinate the activities of the hazardous waste contractors on campus.
- Ensure the university's compliance with all applicable federal (EPA) and state (TDEC) environmental regulations concerning hazardous waste.
- Ensure the university is making an effort to minimize the amounts of hazardous waste generated on campus.
- Be a liaison representing the university during EPA and TDEC regulatory inspections.

Principal Investigator, Classroom Instructor or Supervisor

The principal investigator, classroom instructor, or supervisor has the direct responsibility for assuring that the policy and guidelines established herein are followed by all personnel, including other researchers under their jurisdiction.

Laboratory Workers, Employees, Students, and Other Individuals

The success of the hazardous chemical waste management program at the University is dependent on the conscientious efforts of the individual laboratory worker and staff employee. Because the laboratory workers frequently handle hazardous chemicals, it is essential that they follow the advice, policies, and procedures pertaining to hazardous materials handling. The individual staff members are expected to:

- Manage and dispose of all chemical waste in accordance with established procedures set forth in this disposal policy.
- Maintain the identity of all chemicals with which they work.
- Package and label surplus and waste chemicals in accordance with established procedures set forth in this disposal policy.
- Seek the advice, when necessary, of EHS concerning the proper handling and disposal of hazardous chemicals.

- Ensure they are properly trained on hazardous waste management, and that this documented training is refreshed on an annual basis.

Procedures

Container Management:

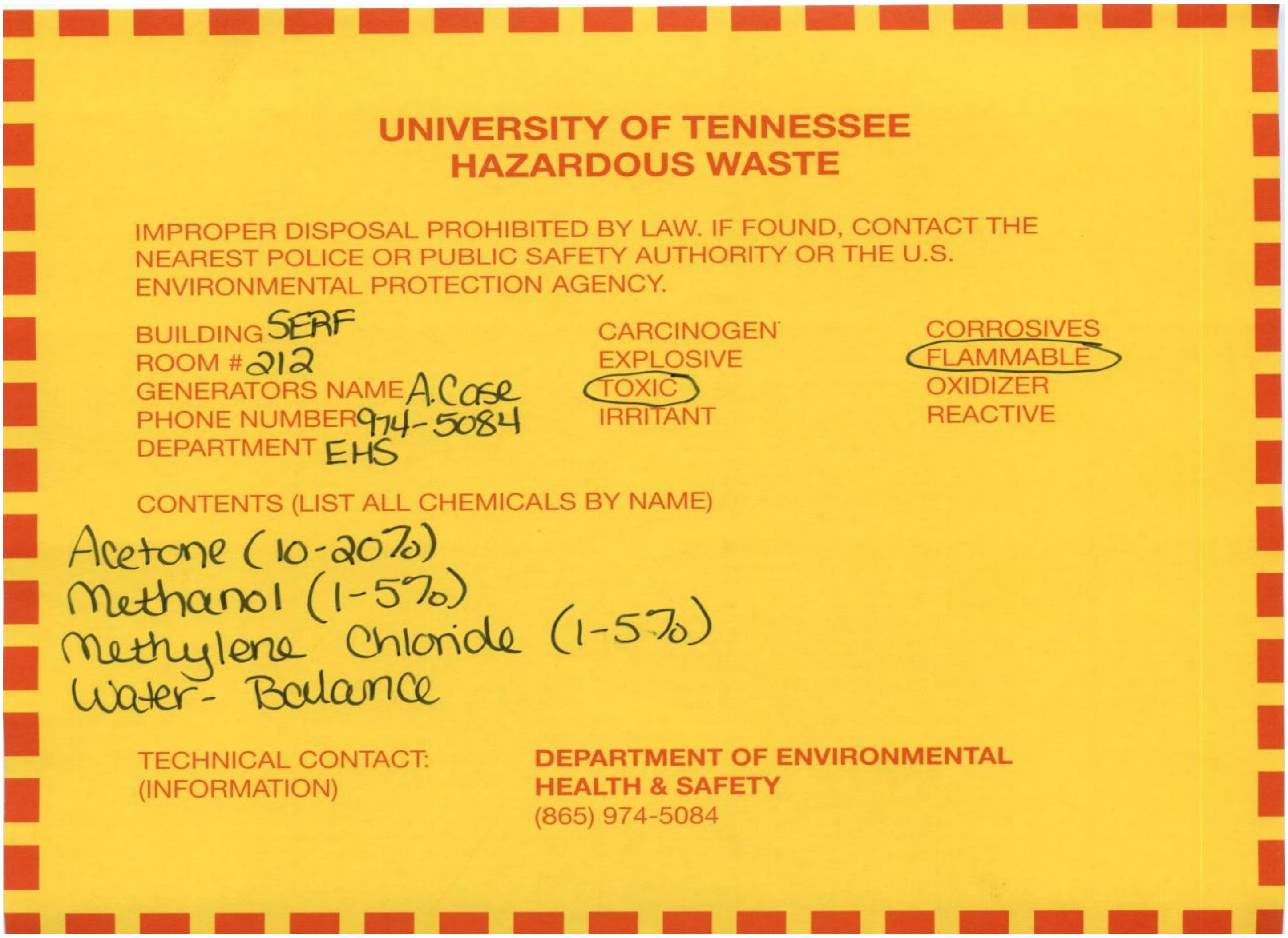
a. All containers must be leak-proof and chemically compatible with their contents. Lids should fit properly so that the container is leak proof.
b. When selecting a waste container, pay attention to the original container material to ensure waste added to the container is not incompatible with residues of the original material. Make sure empty containers once used to hold product are clean and does not contain any remaining product residue.
c. Bags may be used only for dry solids. Needles (capped or uncapped), pipettes, broken glass or other sharp-edged materials that are chemically contaminated are not acceptable in bags. All "sharps" should be placed in puncture-resistant containers.
d. Containers which show signs of contamination on their exterior are not acceptable regardless of their contents. EHS must take every step available to protect its staff from potential chemical hazards.
e. Containers and bags marked with biohazard or radioactive warnings are not acceptable for chemical waste disposal. If a waste has biological and/ or radiological and chemical hazards, please contact EHS for guidance before packaging.
f. Minimize void space in containers by assuring that collection containers should be filled to capacity (with a little head room for expansion) before requesting disposal or combining two containers of identical material into one.
g. When adding hazardous waste to a container, only the constituents that are specifically listed on the waste label should be added and care must be taken not to mix incompatibles.
h. All containers must be closed with a tight-fitting lid, unless waste is being added or removed from the container. It is illegal to store waste in an open container.

Labeling Requirements:

In order to comply with state and federal regulations and University policy, the following information must appear on each container of hazardous waste.

a. "Hazardous Waste": State and federal regulations require that each container must be clearly marked with the words, "Hazardous Waste". EHS requires that all hazardous waste must be labeled with a UTK hazardous waste label. Labels can be obtained from EHS.
b. Generator's Name: The individual who is responsible for the area or process from which the waste originated and contact information (including name, phone # and room #) for the best person to contact if further information about the material is needed.
c. Chemical Constituents: Write all constituents, whether hazardous or non-hazardous, on the waste label. Formulas, trade names, abbreviations, and general names and nomenclature are not acceptable. The proper chemical name must be written out in its entirety. Provide percentage of constituents, if known. Estimates are acceptable.
d. Do not add an accumulation start date; this will be completed by EHS. The date will be added when the waste is brought to EHS for disposal.

Below is an example of a properly completed hazardous waste label:


UNIVERSITY OF TENNESSEE
HAZARDOUS WASTE

IMPROPER DISPOSAL PROHIBITED BY LAW. IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

BUILDING SERF
ROOM # 212
GENERATORS NAME A. Case
PHONE NUMBER 974-5084
DEPARTMENT EHS

CARCINOGEN
EXPLOSIVE
TOXIC
IRRITANT

CORROSIVES
FLAMMABLE
OXIDIZER
REACTIVE

CONTENTS (LIST ALL CHEMICALS BY NAME)

Acetone (10-20%)
Methanol (1-5%)
Methylene Chloride (1-5%)
Water- Balance

TECHNICAL CONTACT:
(INFORMATION)

DEPARTMENT OF ENVIRONMENTAL HEALTH & SAFETY
(865) 974-5084

Storage Requirements:

a. Any container used for disposal and storage of waste must be marked with the information specified in the Labeling section immediately upon placing the first drop of waste into the container.

b. Whenever possible, store flammable waste liquids and waste corrosive liquids in cabinets designed for these materials.

c. Maximum amount that can accumulate in the lab is 55 gallons of hazardous waste or 1 kilogram of acutely toxic waste (Appendix B). If you accumulate more than the maximum amount, the waste needs to be removed from your lab no later than 3 days after these maximum amounts are reached.

d. All waste must be stored in secondary containment (i.e. cabinets and trays), and should be segregated according to hazard class (i.e. flammables, toxics, etc.). The EHS web-site has a partial list of common incompatible chemicals.

e. All hazardous waste should be stored in a Satellite Accumulation Area (SAA) which should be clearly marked with a sign (signs can be obtained from EHS).

Disposal:

Hazardous waste should be brought to the following locations, or contact EHS at 865-974-5084 to coordinate a pickup. Waste should never be left unattended outside the waste room. It must be accepted by an EHS representative. Note that times are subject to change. Please visit the EHS website, https://ehs.utk.edu/ for details and the latest schedule.

Dabney Buehler Approximately monthly there is a direct pickup by the EHS representative for waste. This is announced via email (usually to the Chemistry Listserv).

JIAM (Room G015) Every other Tuesday 1:30-2:30p

MOSSMAN (Room 223) Every other Wednesday 12:45-1:45p

SERF (Science & Engineering Research Facility-Room 207B) Waste room (at loading dock):
Hours: Every Wednesday, 2:00-3:00 p.m.

Strong Hall (Room 119) Every other Thursday 1:30-2:30p

Walters Life Sciences Call for pickup

General Requirements:

a. Hazardous waste should never be disposed of down the sanitary sewer, the storm sewer, placed in the regular trash, by evaporation (a container without a lid implies evaporation for volatile substances), mixing with a biohazard, or mixing with a non-hazardous substance (i.e. dilution).

b. The following items are not classified as hazardous waste and are not included in this policy: sewage; regular trash; universal waste (fluorescent bulbs, batteries); radioactive and biohazard.

c. The burden of hazardous waste determination lies with the waste generator. If unsure whether a waste is hazardous, reviewing the material safety data sheet (MSDS or SDS) or original container labels are good starting points. Unlabeled containers present a number of problems. When in doubt, assume the waste is hazardous and manage as a hazardous waste. EHS should be consulted with any questions concerning hazardous waste determinations.

d. Every effort must be made to minimize and reduce the volumes of hazardous waste generated on campus. Please refer to UTK's Hazardous Waste Minimization Plan for ideas on waste reduction.

Recordkeeping

EHS shall serve as the primary location for records related to hazardous waste. Records shall be maintained on the following

- Hazardous waste manifests
- Annual reports
- Land disposal restrictions
- Waste stream profiles
- Waste determinations
- Disposal certificates
- Waste Minimization Plan
- Emergency Contingency Plan
- Training

- DOT Hazardous Material Shipping
- IATA Hazardous Materials Shipping
- OSHA Hazardous Waste Operations

- Communiqués from and to:
  - Regulatory agencies
  - Hazardous waste vendors
  - Generators of hazardous waste
  - University administration

Most of these records must be maintained for three years to meet regulatory requirements. However to be prudent these records will be kept indefinitely.

Training records shall be maintained by the individual department to whom the employee or student reports. Training records for employees may also be kept in IRIS.

Training and Information Requirements

The director of EHS shall ensure that select staff members in the department are adequately trained in the following subjects:

a. Hazardous substances
b. DOT shipping requirements
c. Hazardous waste management; RCRA regulations
d. Personal protective equipment
e. OSHA HAZWOPER
f. Procedure for submitting the annual report to the Tennessee Department of Environment and Conservation

Department heads, having individuals (staff, faculty and students) under their control who generate hazardous waste, are required under federal and state law to ensure these individuals have been trained and that training must be documented. Training is available from EHS in the form of traditional classroom, or online formats. Training must be completed annually for individuals who generate and manage hazardous waste. For training information, refer to the EHS website https://ehs.utk.edu/ or call 865-974-5084.

Appendices

Appendix A: Waste Management Contacts

Appendix B: List of Acutely Hazardous Substances

Appendix C: Checklist for Laboratory Hazardous Waste Management

Associated Standards

- OSHA 29 CFR 1910.120 (Hazardous Waste)
- EPA 40 CFR 260-270 (Hazardous Waste)
- Tennessee Code Annotated (1200-01-11)

Disclaimer

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

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Appendix A:

Hazardous Waste Management Contacts (EHS)

Mike Rotella – Senior Environmental Coordinator
40 Hr. HAZWOPER Trained; DOT Certification

The Sr. Environmental Coordinator provides expertise in the area of Hazardous Materials Safety and Health Protection Practices.

Scott Moser - Senior Laboratory Safety Specialist
40 Hour HAZWOPER Trained

The Laboratory Safety Specialist provides backup support to the Sr. Environmental Coordinator.

James Cantu-Safety Trainer
Certified Hazardous Materials Manager, Certified Environmental Safety and Health Trainer, Certified Fire Protections Specialist, 40 Hr. HAZWOPER Trained, DOT Certification

The Training Coordinator provides backup support to the Sr. Environmental Coordinator, in addition to training.

Appendix B:

List of Acutely Hazardous Chemicals and Waste Codes

Chemical Name	*Federal P Code*	*CAS Registry Number*
Acetaldehyde, chloro-	P023	107-20-0
Acetamide, N-(aminothioxomethyl)-	P002	591-08-2
Acetamide, 2-fluoro-	P057	640-19-7
Acetic acid, fluoro-, sodium salt	P058	62-74-8
1-Acetyl-2-thiourea	P002	591-08-2
Acrolein	P003	107-02-8
Aldicarb	P070	116-06-3
Aldicarb sulfone	P203	1646-88-4
Aldrin	P004	309-00-2
Allyl alcohol	P005	107-18-6
Aluminum phosphide	P006	20859-73-8
5-(Aminomethyl)-3-isoxazolol	P007	2763-96-4
4-Aminopyridine	P008	504-24-5
Ammonium picrate	P009	131-74-8
Ammonium vanadate	P119	7803-55-6
Argentate(1-), bis(cyano-C)-,potassium	P099	506-61-6
Arsenic acid	P010	7778-39-4
Arsenic oxide	P012	1327-53-3
Arsenic oxide	P011	1303-28-2
Arsenic pentoxide	P011	1303-28-2
Arsenic trioxide	P012	1327-53-3
Arsine, diethyl	P038	692-42-2

Chemical Name	***Federal P Code***	***CAS Registry Number***
Arsonous dichloride, phenyl-	P036	696-28-6
Aziridine	P054	151-56-4
Aziridine, 2-methyl-	P067	75-55-8
Barium cyanide	P013	542-62-1
Benzenamine, 4-chloro-	P024	106-47-8
Benzenamine, 4-nitro-	P077	100-01-6
Benzene, (chloromethyl)-	P028	100-44-7
1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-,	P042	51-43-4
Benzeneethanamine, alpha,alpha- dimethyl-	P046	122-09-8
Benzenethiol	P014	108-98-5
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate.	P127	1563-66-2
Benzoic acid, 2-hydroxy-, compd. With (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8- trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1).	P188	57-64-7
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3- oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%	P001	\1\81-81-2
Benzyl chloride	P028	100-44-7
Beryllium powder	P015	7440-41-7
Bromoacetone	P017	598-31-2
Brucine	P018	357-57-3
2-Butanone, 3,3-dimethyl-1(methylthio)-, O-[methylamino)carbonyl] oxime	P045	39196-18-4
Calcium cyanide	P021	592-01-8
Carbamic acid, [(dibutylamino)- thio]methyl-, 2,3-dihydro-2,2- dimethyl- 7- benzofuranyl ester.	P189	55285-14-8

Chemical Name	***Federal P Code***	***CAS Registry Number***
Carbamic acid, dimethyl-, 1-[(dimethyl- amino)carbonyl]- 5-methyl-1H-pyrazol-3-yl ester.	P191	644-64-4
Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H- pyrazol-5-yl ester.	P192	119-38-0
Carbamic acid, methyl-, 3-methylphenyl ester.	P190	1129-41-5
Carbofuran.	P127	1563-66-2
Carbon disulfide	P022	75-15-0
Carbonic dichloride	P095	75-44-5
Carbosulfan	P189	55285-14-8
Chloroacetaldehyde	P023	107-20-0
p-Chloroaniline	P024	106-47-8
1-(o-Chlorophenyl)thiourea	P026	5344-82-1
3-Chloropropionitrile	P027	542-76-7
Copper cyanide	P029	544-92-3
m-Cumenyl methylcarbamate.	P202	64-00-6
Cyanides (soluble cyanide salts), not otherwise specified	P030	
Cyanogen	P031	460-19-5
Cyanogen chloride	P033	506-77-4
2-Cyclohexyl-4,6-dinitrophenol	P034	131-89-5
Dichloromethyl ether	P016	542-88-1
Dichlorophenylarsine	P036	696-28-6
Dieldrin	P037	60-57-1
Diethylarsine	P038	692-42-2
Diethyl-p-nitrophenyl phosphate	P041	311-45-5
O,O-Diethyl O-pyrazinyl phosphorothioate	P040	297-97-2

Chemical Name	***Federal P Code***	***CAS Registry Number***
Diisopropylfluorophosphate (DFP)	P043	55-91-4
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a,-hexahydro- ,(1alpha,4alpha,4abeta,5alpha,8alpha,8 abeta)-	P004	309-00-2
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a-hexahydro- ,(1alpha,4alpha,4abeta,5beta,8beta,8ab eta)-	P060	465-73-6
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-,alpha,7beta, 7aalpha)-b]oxirene, 3,4,5,6,9,9-hexachloro- 1a,2,2a,3,6,6a,7,7a-octahydro-,(1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta, 7aalpha)-, & metabolites	P051	72-20-8
Dimethoate	P044	60-51-5
alpha,alpha-Dimethylphenethylamine	P046	122-09-8
Dimetilan.	P191	644-64-4
4,6-Dinitro-o-cresol, & salts	P047	534-52-1
2,4-Dinitrophenol	P048	51-28-5
Dinoseb	P020	88-85-7
Diphosphoramide, octamethyl-	P085	152-16-9
Diphosphoric acid, tetraethyl ester	P111	107-49-3
Disulfoton	P039	298-04-4
Dithiobiuret	P049	541-53-7
1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O- [(methylamino)-carbonyl]oxime.	P185	26419-73-8
Endosulfan	P050	115-29-7
Endothall	P088	145-73-3
Endrin	P051	72-20-8
Endrin, & metabolites	P051	72-20-8

Chemical Name	*Federal P Code*	*CAS Registry Number*
Epinephrine	P042	51-43-4
Ethanedinitrile	P031	460-19-5
Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino)carbonyl]oxy]-2-oxo-, methyl ester.	P194	23135-22-0
Ethanimidothioic acid,N-[[(methylamino)carbonyl]oxy]-,methyl ester	P066	16752-77-5
Ethyl cyanide	P101	107-12-0
Ethyleneimine	P054	151-56-4
Famphur	P097	52-85-7
Fluorine	P056	7782-41-4
Fluoroacetamide	P057	640-19-7
Fluoroacetic acid, sodium salt	P058	62-74-8
Formetanate hydrochloride.	P198	23422-53-9
Formparanate.	P197	17702-57-7
Fulminic acid, mercury(2+) salt	P065	628-86-4
Heptachlor	P059	76-44-8
Hexaethyl tetraphosphate	P062	757-58-4
Hydrazinecarbothioamide	P116	79-19-6
Hydrazine, methyl-	P068	60-34-4
Hydrocyanic acid	P063	74-90-8
Hydrogen cyanide	P063	74-90-8
Hydrogen phosphide	P096	7803-51-2
Isodrin	P060	465-73-6
Isolan.	P192	119-38-0
3-Isopropylphenyl N-methylcarbamate.	P202	64-00-6
3(2H)-Isoxazolone, 5-(aminomethyl)-	P007	2763-96-4

Chemical Name	***Federal P Code***	***CAS Registry Number***
Manganese,bis(dimethylcarbamodithioato-S,S')-,	P196	15339-36-3
Manganese dimethyldithiocarbamate.	P196	15339-36-3
Mercury, (acetato-O)phenyl-	P092	62-38-4
Mercury fulminate (R,T)	P065	628-86-4
Methanamine, N-methyl-N-nitroso-	P082	62-75-9
Methane, isocyanato-	P064	624-83-9
Methane, oxybis[chloro-	P016	542-88-1
Methane, tetranitro- (R)	P112	509-14-8
Methanethiol, trichloro-	P118	75-70-7
Methanimidamide,N,N-dimethyl-N'-[3-[[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride.	P198	23422-53-9
Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl]oxy]phenyl]-	P197	17702-57-7
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10- hexachloro-1,5,5a,6,9,9a- hexahydro-, 3-oxide	P050	115-29-7
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	P059	76-44-8
Methiocarb.	P199	2032-65-7
Methomyl	P066	16752-77-5
Methyl hydrazine	P068	60-34-4
Methyl isocyanate	P064	624-83-9
2-Methyllactonitrile	P069	75-86-5
Methyl parathion	P071	298-00-0
Metolcarb.	P190	1129-41-5
Mexacarbate.	P128	315-8-4
alpha-Naphthylthiourea	P072	86-88-4
Nickel carbonyl	P073	13463-39-3

Chemical Name	***Federal P Code***	***CAS Registry Number***
Nickel cyanide	P074	557-19-7
Nicotine, & salts	P075	54-11-5
Nitric oxide	P076	10102-43-9
p-Nitroaniline	P077	100-01-6
Nitrogen dioxide	P078	10102-44-0
Nitrogen oxide NO	P076	10102-43-9
Nitroglycerine	P081	55-63-0
N-Nitrosodimethylamine	P082	62-75-9
N-Nitrosomethylvinylamine	P084	4549-40-0
Octamethylpyrophosphoramide	P085	152-16-9
Osmium tetroxide	P087	20816-12-0
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	P088	145-73-3
Oxamyl.	P194	23135-22-0
Parathion	P089	56-38-2
Phenol, 2-cyclohexyl-4,6-dinitro-	P034	131-89-5
Phenol, 2,4-dinitro-	P048	51-28-5
Phenol, 2-methyl-4,6-dinitro-, & salts	P047	534-52-1
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	P020	88-85-7
Phenol, 2,4,6-trinitro-, ammonium salt ®	P009	131-74-8
Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester).	P128	315-18-4
Phenol, (3,5-dimethyl-4-(methylthio)-,methylcarbamate	P199	2032-65-7
Phenol, 3-(1-methylethyl)-, methylcarbamate.	P202	64-00-6
Phenol, 3-methyl-5-(1-methylethyl)-,methyl carbamate.	P201	2631-37-0
Phenylmercury acetate	P092	62-38-4
Phenylthiourea	P093	103-85-5

Chemical Name	*Federal P Code*	*CAS Registry Number*
Phorate	P094	298-02-2
Phosgene	P095	75-44-5
Phosphine	P096	7803-51-2
Phosphoric acid, diethyl 4-nitrophenylester	P041	311-45-5
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	P039	298-04-4
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)methyl] ester	P094	298-02-2
Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	P044	60-51-5
Phosphorofluoridic acid, bis(1-methylethyl) ester	P043	55-91-4
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	P089	56-38-2
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	P040	297-97-2
Phosphorothioic acid,O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester	P097	52-85-7
Phosphorothioic acid, O,O,-dimethyl O(4-nitrophenyl) ester	P071	298-00-0
Physostigmine.	P204	57-47-6
Physostigmine salicylate.	P188	57-64-7
Plumbane, tetraethyl-	P110	78-00-2
Potassium cyanide	P098	151-50-8
Potassium cyanide K(CN)	P098	151-50-8
Potassium silver cyanide	P099	506-61-6
Promecarb	P201	2631-37-0
Propanal, 2-methyl-2-(methylthio)-,O-[(methylamino)carbonyl]oxime	P070	116-06-3
Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime.	P203	1646-88-4
Propanenitrile	P101	107-12-0
Propanenitrile, 3-chloro-	P027	542-76-7
Propanenitrile, 2-hydroxy-2-methyl-	P069	75-86-5

Chemical Name	***Federal P Code***	***CAS Registry Number***
1,2,3-Propanetriol, trinitrate	P081	55-63-0
2-Propanone, 1-bromo-	P017	598-31-2
Propargyl alcohol	P102	107-19-7
2-Propenal	P003	107-02-8
2-Propen-1-ol	P005	107-18-6
1,2-Propylenimine	P067	75-55-8
2-Propyn-1-ol	P102	107-19-7
4-Pyridinamine	P008	504-24-5
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts	P075	54-11-5
Pyrrolo[2,3-b]indol-5-ol,1,2,3,3a,8,8a-hexahydro-1,3a,8- trimethyl-, methylcarbamate (ester), (3aS-cis)-.	P204	57-47-6
Selenious acid, dithallium(1+) salt	P114	12039-52-0
Selenourea	P103	630-10-4
Silver cyanide	P104	506-64-9
Silver cyanide Ag(CN)	P104	506-64-9
Sodium azide	P105	26628-22-8
Sodium cyanide	P106	143-33-9
Sodium cyanide Na(CN)	P106	143-33-9
Strychnidin-10-one, & salts	P108	57-24-9
Strychnidin-10-one, 2,3-dimethoxy-	P018	357-57-3
Strychnine, & salts	P108	57-24-9
Sulfuric acid, dithallium(1+) salt	P115	7446-18-6
Tetraethyldithiopyrophosphate	P109	3689-24-5
Tetraethyl lead	P110	78-00-2
Tetraethyl pyrophosphate	P111	107-49-3

Chemical Name	***Federal P Code***	***CAS Registry Number***
Tetranitromethane	P112	509-14-8
Tetraphosphoric acid, hexaethyl ester	P062	757-58-4
Thallic oxide	P113	1314-32-5
Thallium(I) selenite	P114	12039-52-0
Thallium(I) sulfate	P115	7446-18-6
Thiodiphosphoric acid, tetraethylester	P109	3689-24-5
Thiofanox	P045	39196-18-4
Thioimidodicarbonic diamide	P049	541-53-7
Thiophenol	P014	108-98-5
Thiosemicarbazide	P116	79-19-6
Thiourea, (2-chlorophenyl)-	P026	5344-82-1
Thiourea, 1-naphthalenyl-	P072	86-88-4
Thiourea, phenyl-	P093	103-85-5
Tirpate.	P185	26419-73-8
Toxaphene	P123	8001-35-2
Trichloromethanethiol	P118	75-70-7
Vanadic acid, ammonium salt	P119	7803-55-6
Vanadium pentoxide	P120	1314-62-1
Vinylamine, N-methyl-N-nitroso-	P084	4549-40-0
Warfarin, & salts, when present at concentrations greater than 0.3%	P001	81-81-2
Zinc, bis(dimethylcarbamodithioato- S,S')-,	P205	137-30-4
Zinc cyanide	P121	557-21-1
Zinc phosphide	P122	1314-84-7
Ziram.	P205	137-30-4

Appendix C:

Checklist for Laboratory Hazardous Waste Management

Building: ___________________________ Room: ______ Dept. ____________________________________

Date: _____________ PI/Supervisor: ____

Person Completing Checklist: ____

Hazardous Waste Labeled & Closed	
☐	Are UT yellow-and-red waste labels on all hazardous waste (**HW**) containers? Call EHS at 865-974-5084 for additional labels if needed. (**Note:** if disposing of a surplus chemical in the original bottle, a HW label is not needed).
☐	If the waste container previously held other contents, are the previous labels removed or defaced? (NOTE – a single "X" with a sharpie is not sufficient; the original label must be significantly obscured such as by covering with duct tape or paint marker).
☐	Are waste containers kept closed at all times, except when adding or removing waste? Waste cannot be stored in open containers (such as flasks and beakers). Paraffin is also not allowed.
☐	Is waste container labeled as soon as the first drop of waste is added to the container?
☐	Are full chemical names spelled out on the UT HW label (abbreviations, trade names and formulas are not acceptable)? **Note: Do not add a date to the waste container.**
☐	From the time the container is full, is the waste container brought to EHS as soon as possible?
☐	Are waste containers in good shape, leak-resistant and chemically compatible with the waste?
☐	For liquid waste, is it in puncture-proof, sealed container such that if it gets knocked over it won't spill?

Hazardous Waste Training	
☐	Have all lab personnel received training on managing wastes in this lab? To include: • Where waste is stored in the lab • Chemical disposal procedures (what must be collected vs. can be disposed down the drain) • How waste is segregated (which chemicals can't be mixed together) • That they are responsible to keep waste containers labeled and closed • Not to use food containers to store hazardous materials • Location and use of spill kit • Location of Chemical Hygiene Plan and lab waste guidance EHS offers classroom and on-line training for general hazardous waste management requirements. For more information, please contact EHS at 865-974-5084.
Hazardous Waste Storage Areas (Satellite Accumulation Areas)	
☐	Are HW storage areas designated in the lab and identified with a yellow "Hazardous Waste Storage Area" sign? (Call 865-974-5084 if you need a sign.)
☐	Is there easy access to the HW storage area, which is not blocked by equipment or supplies?
☐	Are areas where waste is generated and stored uncluttered and cleanable if there is a spill?
☐	If HW is stored in the lab, ensure the HW check box is selected on the door placard. (Call 865-974-5084 or email ehs_labsafety@utk.edu if you need assistance with door placard.)

Other Waste Management:	
☐	Is a chemical spill kit available in the lab? NOTE – The spill kit can be as simple as gloves, garbage bags, kitty litter, paper towel/blue pads, etc. in a plastic container. If you use mercury or mercury thermometers, a mercury clean-up sponge kit should be available in the vicinity. The recommended alternative is to replace mercury thermometers with red alcohol thermometers, and turn the mercury thermometers in at the next waste collection or bring to the waste room.
☐	Does everyone in the lab know where the spill kit is located and how to use it?
☐	Is there an emergency plan in case of emergencies?
☐	Do waste containers have secondary containment, such as trays or tubs to contain a spill or in case of leakage from the primary waste containers?
☐	Has the PI, lab manager, or designee periodically (at least annually, and more often if using particularly hazardous materials) reviewed the chemicals for the following hazards? • Labels that have become unreadable or fallen off • Containers that are damaged • Contents that are waste because they are no longer usable • Chemicals that become unstable or reactive with age, light, drying out, etc and are a safety hazard to keep
☐	Has the PI, lab manager, or designee periodically (at least annually, and more often if using particularly hazardous materials) looked through the lab area and under cabinets (esp. under sinks and fume hoods) for waste that has been abandoned?
☐	Is someone from the lab designated to bring the waste items to the waste room or to the waste collection?
☐	Have you investigated ways to minimize the amount or toxicity of the waste chemicals generated?

For additional guidance on hazardous waste practices review the Hazardous Waste Management Policy on the EHS website (https://ehs.utk.edu/), contact EHS at 865-974-5084 or email at safety@utk.edu.