

Appendix H

EPA Hazardous Waste Law

This Appendix is intended to give you background information on hazardous waste laws and how they apply to you. For most U.S. Environmental Protection Agency (EPA) requirements that apply to the University, the Safety Department maintains compliance through internal inspections, record keeping and proper disposal. In Wisconsin, the Department of Natural Resources (DNR) has adopted the EPA regulations, consequently EPA and DNR regulations are nearly identical.

EPA defines hazardous waste as hazardous *chemical* waste; radioactive, infectious and biohazardous waste are regulated by other agencies.

This Appendix only deals with "hazardous waste" as defined by the EPA. Legally, EPA defines hazardous waste as certain hazardous *chemical* waste. This Appendix does not address other types of regulated laboratory wastes, such as infectious, biological, radioactive or sharps. Chapter 8 describes disposal procedures for animals. Chapter 9 describes disposal procedures for sharps and other waste that can puncture tissue. Chapter 11 discusses Radiation and the Radiation Safety for Radiation Workers provides guidelines for the disposal of radioactive waste. Procedures for medical waste are written by the UW Hospital Safety Officer. The Office of Biological Safety can provide guidance for the disposal of infectious and biological waste.

If a waste can be defined as:

- ignitable
- corrosive
- reactive or
- it fails the TCLP then it is an EPA hazardous waste.

EPA regulations focus on industrial waste streams. As a result, many laboratory chemical wastes are not regulated by EPA as hazardous chemical waste. However, many unregulated chemical wastes do merit special handling and disposal procedures. Thus, Chapter 7 and Appendix A of this *Guide* recommend disposal procedures for many unregulated wastes as if they were EPA hazardous waste.

H.1 What is an EPA Hazardous Waste?

EPA hazardous wastes consist of chemical wastes that exhibit the characteristic of *corrosivity, ignitability or reactivity* or *fail the toxicity characteristic leaching procedure (TCLP)*, which is described below or are *listed by EPA as hazardous waste* (see Annex H-1 for a list).

Corrosive chemicals include hydrochloric acid and ammonium hydroxide.

- ◆ **Corrosivity**-- waste is considered to be corrosive if it is:
 1. aqueous and has a pH less than or equal to 2 (acid) or greater than or equal to 12.5 (base); or
 2. a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F).
- ◆ **Ignitability** -- waste is considered to be ignitable if it is:
 1. a liquid, other than an aqueous solution containing less than 24% alcohol by volume and has a flash point less than 60 °C (140 °F);
 2. not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard;
 3. an ignitable compressed gas; or
 4. an oxidizer.
- ◆ **Reactivity** -- waste is considered to be reactive if it:
 1. is normally unstable and readily undergoes violent change without detonating;

Ignitable chemicals include: acetone, white phosphorus and benzoyl peroxide.

Reactive chemicals include: lithium metal, sodium polysulfide, trinitrotoluene and nitroglycerine.

2. reacts violently with water;
3. forms potentially explosive mixtures with water;
4. generates toxic gases, vapors or fumes, when mixed with water, in a quantity sufficient to present a danger to human health or the environment;
5. is a cyanide or sulfide bearing waste, which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to endanger human health or the environment;
6. is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement;
7. is readily capable of detonation or explosive decomposition at standard pressure and temperature; or
8. is a DOT Class A, Class B or forbidden explosive.

The multi-step TCLP procedure involves extraction, filtration and, in the case of some organic analysis, a second extraction before analysis.

- ♦ **Fails the Toxicity Characteristic Leaching Procedure (TCLP).** EPA hazardous waste includes any waste that fails the Toxicity Characteristic Leaching Procedure (40 CFR 261). This procedure simulates the ability of a compound to leach out of a landfill and enter into groundwater. Waste materials contaminated with these chemicals are regulated as EPA hazardous wastes:

Toxicity Characteristic Chemicals			
Arsenic	<i>o</i> -Cresol	Hexachlorobenzene	Pyridine
Barium	<i>p</i> -Cresol	Hexachlorobutadiene	Selenium
Benzene	Cresol, total	Hexachloroethane	Silver
Cadmium	2,4-D	Lead	Tetrachloroethylene
Carbon Tetrachloride	1,4-Dichlorobenzene	Lindane	Toxaphene
Chlordane	1,2-Dichloroethane	Mercury	Trichloroethylene
Chlorobenzene	1,1-Dichloroethylene	Methoxychlor	2,4,5-Trichlorophenol
Chloroform	2,4-Dinitrotoluene	Methyl Ethyl Ketone	2,4,6-Trichlorophenol
Chromium	Endrin	Nitrobenzene	2,4,5-TP Silvex
<i>M</i> -Cresol	Heptachlor	Pentachlorophenol	Vinyl Chloride

Practical Applications of TCLP: Testing a waste material to see if it exhibits the characteristic of toxicity can be very expensive. If a waste contains a toxicity characteristic chemical, and it is a small volume, we assume that it is an EPA hazardous waste. If you generate large volumes of waste containing toxicity characteristic chemicals, call the Safety Department. We will have the material analyzed to determine if it is an EPA hazardous waste exhibiting the characteristic of toxicity.

- ♦ **Listed EPA Hazardous Wastes.** EPA hazardous wastes also include hazardous wastes from non-specific sources and discarded commercial chemical products that are listed as acute hazardous wastes and toxic wastes. EPA lists these chemicals as EPA hazardous waste because they are either toxic, reactive, ignitable or corrosive. An alphabetical compilation of these lists is found in Annex H-1 to this Appendix.

Generation is the term that is used to describe the process of making waste. Because the University makes hazardous wastes, it is considered to be a hazardous waste generator.

H.2 Storage of EPA Hazardous Waste

The storage of EPA hazardous wastes should first adhere to the guidelines for safe storage of chemicals, as discussed in Chapter 4 of this *Guide*.

There are additional EPA requirements for accumulation of hazardous waste in laboratories (otherwise known as *satellite accumulation*). All EPA hazardous waste containers must:

There is no way to make a hazardous material nonhazardous; dilution is **not** the solution.

- ✓ be clearly marked "Hazardous Waste".
- ✓ be stored close to where the waste is generated (i.e., can not be moved from one lab into another room to await disposal).
- ✓ stored in a secure area that laboratory personnel have supervision and control over (i.e., not in a hallway).
- ✓ be securely capped except when waste is being added. This will reduce the risk of fire, your exposure to toxic chemicals, and spills in case the container is tipped. This also reduces laboratory emissions and prevents the illegal disposal of waste by evaporation.
- ✓ If a container holding hazardous waste begins to leak, the contents must be **immediately** transferred to another container.

H.3 Waste versus Surplus Chemical

Please do not mark a surplus chemical as a "waste" unless you are certain it is not usable.

Many unwanted laboratory chemicals at the University are not really waste, but rather they are chemicals surplus to the lab's needs but they may be of use by other labs. When the Safety Department removes a chemical from your laboratory, we examine it to determine if others on campus can use or reuse it. Reusable chemicals designated for redistribution are then advertised to other campus laboratories for free delivery. Only if no other laboratory wants the surplus chemical after being advertised for 3 years does a surplus chemical become a waste. Therefore, do not mark a surplus chemical as a "waste" unless you are certain it is not usable.

The one exception to the "surplus" rule is the waste organic solvents that you place in the carboys provided by the Safety Department. Because these used organic solvents are difficult to reuse, they are designated as waste when they are generated in your laboratory. All Safety Department carboys have tags with the words "Hazardous Waste."

On occasion, you may generate other wastes that cannot be reused. If so, please call the Safety Department to determine:

- ◆ if the waste is regulated as an EPA hazardous waste and
- ◆ if additional requirements may apply for containing, storing and labeling.

Because of these considerations, in most laboratories, only carboys of waste organic solvents must adhere to the EPA storage requirements.

H.4 Prohibited Disposal Methods

According to Federal and State law, EPA hazardous waste must **not** be disposed of by certain polluting methods. Dispose of chemicals by identifying the compound in Appendix A and following the procedures in Chapter 7 of this *Guide*. Remember, EPA hazardous wastes must not be disposed:

Toxic and ignitable solvents must never be intentionally evaporated to dispose of them.

- ◆ in the normal trash, in the garbage or refuse nor in recycling bins, glass receptacles, sharps containers or red bags.
- ◆ by evaporation.
- ◆ by dilution; if EPA hazardous wastes are diluted or combined with a nonhazardous material, the resultant material is still regulated as an EPA hazardous waste.

Annex H-1. Listed EPA Hazardous Wastes

Acetaldehyde	Arsenic pentoxide
Acetaldehyde, chloro-	Arsenic trioxide
Acetaldehyde, trichloro-	Arsine
Acetamide, N-(aminothioxomethyl)-	Arsonous dichloride, phenyl-
Acetamide, N-(4-ethoxyphenyl)-	Auramine
Acetamide, 2-fluoro-	Azaserine
Acetamide, N-(9H-fluoren-2-yl)-	Aziridine
Acetic acid, ethyl ester	Aziridine, 2-methyl-
Acetic acid, fluoro-, sodium salt	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione,
Acetic acid, lead(II) salt	6-amino-8-[[aminocarbonyloxy]methyl]-
Acetic acid, thallium(I) salt	1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-
Acetic acid, (2,4,5-trichlorophenoxy)-	[1aS(1aa,8b,8a α ,8b α)]-
Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester	Barium cyanide
Acetone	Benz[j]lanceanthrylene, 1,2-dihydro-3-methyl-
Acetone cyanohydrin	Benz[c]acridine
Acetonitrile	3,4-Benzacridine
3-(α -Acetylbenzyl)-4-hydroxycoumarin and salts	Benzal chloride
Acetophenone	Benz[a]anthracene
2-Acetylaminofluorene	1,2-Benzanthracene
1-Acetyl-2-thiourea	1,2-Benzanthracene, 7,12-dimethyl-
Acetyl chloride	Benzene
Acetylene dichloride	Benzeneacetic acid, 4-chloro- α -(4-chlorophenyl)- α -hydroxy, ethyl ester
Acrolein	Benzenamine
Acrylamide	Benzenamine), 4,4'-carbonimidoylbis(N,N-dimethyl-
Acrylic acid	Benzeneamine, 4-chloro-
Acrylonitrile	Benzenamine, 4-chloro-2-methyl-, hydrochloride
Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	Benzenamine, N,N-dimethyl-4-(phenylazo)-
Aldicarb	Benzenamine, 2-methyl-
Aldrin	Benzenamine), 4,4'-methylenebis(2-chloro-
Allyl alcohol	Benzenamine, 2-methyl-5-nitro-
Aluminum phosphide	Benzenamine, 2-methyl-, hydrochloride
5-(Aminomethyl)-3-isoxazole	Benzenamine, 4-methyl-
2-Amino-1-methylbenzene	Benzeneamine, 4-nitro-
4-Amino-1-methylbenzene	Benzene, 1-bromo-4-phenoxy-
Amitrole	Benzene, chloro-
4-Aminopyridine	Benzene, chloromethyl-
Ammonium picrate	1,2-Benzenedicarboxylic acid anhydride
Ammonium vanadate	1,2-Benzenedicarboxylic acid, bis(2-ethyl-hexyl)ester
Aniline	1,2-Benzenedicarboxylic acid, dibutyl ester
Argentate (1-), bis(cyano)-, potassium	1,2-Benzenedicarboxylic acid, diethyl ester
Arsenic acid	1,2-Benzenedicarboxylic acid, dimethyl ester
Arsenic acid, dimethyl-	1,2-Benzenedicarboxylic acid, dioctyl ester
Arsenic (III) oxide	Benzene, 1,2-dichloro-
Arsenic (V) oxide	

Benzene, 1,3-dichloro-
 Benzene, 1,4-dichloro-
 Benzene, (dichloromethyl)-
 Benzene, 1,3-diisocyanatomethyl-
 Benzene, dimethyl-
 1,3-Benzenediol
 1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-
 Benzene, hexachloro-
 Benzene, hexahydro-
 Benzene, hydroxy-
 Benzene, methyl-
 Benzene, 1-methyl-2,4-dinitro-
 Benzene, 1-methyl-2,6-dinitro-
 Benzene, 1,2-methylenedioxy-4-allyl-
 Benzene, 1,2-methylenedioxy-4-propenyl-
 Benzene, 1,2-methylenedioxy-4-propyl-
 Benzene, (1-methylethyl)-
 Benzene, nitro-
 Benzene, pentachloro-
 Benzene, pentachloronitro-
 Benzenesulfonic acid chloride
 Benzenesulfonyl chloride
 Benzenethiol
 Benzene, 1,3,5-trinitro-
 Benzidine
 1,2-Benzisothiazol-3(2H)-one-1,1-dioxide, and salts
 Benzo [j,k] fluorene
 Benzo[a]pyrene
 2H-1-Benzopyran-2-one,
 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts
 3,4-Benzopyrene
 p-Benzoquinone
 Benzotrichloride
 1,2-Benzphenanthrene
 Benzyl chloride
 Beryllium
 2,2'-Bioxirane
 (1,1'-Biphenyl)-4,4'-diamine
 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dichloro-
 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethoxy-
 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl-
 Bis(2-chlorethoxy)methane
 Bis(2-chloroethyl) ether
 Bis(2-chloroisopropyl) ether
 Bis(chloromethyl) ether
 Bis(dimethylthiocarbomoyl) disulfide
 Bis(2-ethylhexyl) phthalate
 Black Leaf
 Bladan
 Bromine cyanide
 Bromoacetone
 Bromoform
 Bromomethane
 4-Bromophenyl phenyl ether
 Brucine
 Butadiene diepoxide
 1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
 1-Butanamine, N-butyl-N-nitroso-
 Butanoic acid,
 4-[p-Bis(2-chloroethyl)amino-phenyl]-
 1-Butanol
 2-Butanone
 2-Butanone, 3,3-dimethyl-1-(Methylthio)-,
 O-(methylaminocarbonyl)oxime
 2-Butanone peroxide
 2-Butenal
 2-Butene, 1,4-dichloro-
iso-Butyl alcohol
 n-Butyl alcohol
 2-(sec-Butyl)-4,6-dinitrophenol
 Cacodylic acid
 Calcium chromate
 Calcium cyanide
 Camphene, octachloro-
 Carbamic acid, ethyl ester
 Carbamic acid, N-methyl-N-nitroso-, ethyl ester
 Carbamide, N-ethyl-N-nitroso-
 Carbamide, N-methyl-N-nitroso-
 Carbamide, thio
 Carbamic chloride, dimethyl-
 Carbamimidoseleonic acid
 Carbon bisulfide
 Carbon disulfide
 Carbon oxyfluoride
 Carbon tetrachloride
 Carbonic acid, dithallium(I) salt
 Carbonochloridic acid, methyl ester
 Carbonyl chloride
 Chloral
 Chlorambucil
 Chlordane
 Chlorinated fluorocarbons
 Chlorine cyanide
 Chlornaphazin
 Chloroacetaldehyde

<i>p</i> -Chloroaniline	2-Deoxy-2-(3-methyl-3-nitrosourido)-D-glucopyranose
Chlorobenzene	DFP
Chlorobenzilate	Diallate
4-Chloro- <i>m</i> -cresol	Diamine
1-Chloro-2,3-epoxypropane	Diaminotoluene
4-(bis(2-Chloroethyl)amino)-L-phenylalanine	O-Diazoacetyl-L-serine
5-[bis(2-Chloroethyl)amino]-2,4-(1H,3H)-pyrimidinedione	Dibenz(a,h)anthracene
5-[bis(2-chloroethyl)amino]uracil	1,2:5,6-Dibenzanthracene
2-Chloroethyl vinyl ether	1,2:7,8-Dibenzopyrene
Chloroform	Dibenzo[a,i]pyrene
Chloromethane	1,2-Dibromo-3-chloropropane
Chloromethyl ether	1,2-Dibromoethane
Chloromethyl methyl ether	Dibromomethane
2-(chloromethyl)oxirane	Dibutyl phthalate
β -Chloronaphthalene	S-(2,3-Dichloroallyl)diisopropylthiocarbamate
<i>o</i> -Chlorophenol	<i>m</i> -Dichlorobenzene
1-(<i>o</i> -Chlorophenyl)thiourea	<i>o</i> -Dichlorobenzene
3-Chloropropionitrile	<i>p</i> -Dichlorobenzene
3-Chloropropylene oxide	3,3'-Dichlorobenzidine
4-Chloro- <i>o</i> -toluidine, hydrochloride	1,4-Dichloro-2-butene
Chromic acid, calcium salt	Dichlorodifluoromethane
Chrysene	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide
Compound 1080	Dichloro diphenyl dichloroethane
Copper(I) cyanide	Dichloro diphenyl trichloroethane
Creosote	1,1-Dichloroethane
Cresols	1,2-Dichloroethane
Cresylic acid	1,1-Dichloroethylene
Crotonaldehyde	1,2-Dichloroethylene
Cumene	Dichloroethyl ether
Cumene hydroperoxide	Dichloroethyl formal
Cyanides (soluble cyanide salts), n.o.s.	Dichloromethane
Cyanogen	Dichloromethyl ether
Cyanogen bromide	2,4-Dichlorophenol
Cyanogen chloride	2,6-Dichlorophenol
2,5-Cyclohexadiene-1,4-dione	2,4-Dichlorophenoxyacetic acid, salts and esters
Cyclohexane	Dichlorophenylarsine
Cyclohexanone	1,2-Dichloropropane
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	1,3-Dichloropropene
Cyclophosphamide	Dieldrin
Cygon	1,2:3,4-Diepoxybutane
2,4-D, salts and esters	Diethylarsine
Daunomycin	1,4-Diethylene oxide
DDD	1,2-Diethylhydrazine
DDT	N,N'-Diethylhydrazine
Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[c,d]pentalen-2-one	O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate
DES	O,O-Diethyl S-methyl dithiophosphate
Demeton-S	

O,O-Diethyl S-methyl phosphorodithiolate	α,α -Dimethylphenethylamine
Diethyl <i>p</i> -nitrophenyl phosphate	Dimethyl phthalate
O,O-Diethyl O-(4-nitrophenyl) phosphorothiolate	Dimethyl sulfate
Diethyl paroxon	DINEX
Diethyl phthalate	4,6-Dinitro- <i>o</i> -cresol, and salts
O,O-Diethyl O-pyrazinyl phosphorothioate	4,6-Dinitro- <i>o</i> -cyclohexyl phenol
a,a'-Diethyl-4,4'-stilbenediol	2,4-Dinitrophenol
Diethylstilbestrol	2,4-Dinitrotoluene
1,2-Dihydro-3,6-pyridazinedione	2,6-Dinitrotoluene
Dihydrosafrole	Dinoseb
1,3-Dihydroxybenzene	Di- <i>n</i> -octyl phthalate
Diisopropyl fluorophosphate (DFP)	1,4-Dioxane
Dimethoate	1,2-Diphenylhydrazine
2,7:3,6-Dimethanonaphth[2,3b]oxirane, octahydro, (1 α ,2 β ,2 α β ,3 α ,6 α ,6 α β ,7 β ,7 α α)	Diphosphoramidate, octamethyl-
2,7:3,6-Dimethanonaphth[2,3b]oxirane, octahydro, (1 α ,2 β ,2 α α ,3 β ,6 β ,6 α α ,7 β ,7 α α)	Dipropylamine
1,4:5,6-Dimethanonaphthalene,1,2,3,4,10,10-hexac hloro-1,4,4a,5,8,8a-hexahydro, (1 α ,4 α ,4 α β ,5 β ,8 β ,8 α β)-	Di- <i>n</i> -propylnitrosamine
1,4:5,8-Dimethanonaphthalene,1,2,3,4,10,10-hexac hloro-1,4,4a,5,8,8a-hexahydro, (1 α ,4 α ,4 α β ,5 α ,8 α ,8 α β)-	Disulfoton
3,3'-Dimethoxybenzidine	Disystox
Dimethylamine	Dithane A-40
<i>p</i> -Dimethylaminoazobenzene	2,4-Dithiobiuret
Dimethylarsonic acid	Dithiodemeton
7,12-Dimethylbenz[a]anthracene	Dithiopyrophosphoric acid, tetraethyl ester
3,3'-Dimethylbenzidine	Dowfume 40
α,α -Dimethylbenzylhydroperoxide	Dowfume MC-2
Dimethylcarbamoyl chloride	Endosulfan
O,O-Dimethyl	Endothall
O-(<i>p</i> -(N,N-dimethylsulfamoyl)phenyl) phosphorothiolate	Endrin, and metabolites
1,1-Dimethylhydrazine	Epichlorohydrin
1,2-Dimethylhydrazine	Epinephrine
3,3'-Dimethyl-4,4'-(4-hydroxy-5-amino-2,7-napht halene disulfonic acid-3-yl azo)-1,1'-biphenyl tetrasodium salt	2,3-Epoxypropionaldehyde
O,O-Dimethyl S-(N-methylcarbamoylmethyl) phosphorodithiolate	Ethanal
3,3-Dimethyl-1-(methylthio)-2-butanone	Ethanamine, 1,1-dimethyl-2-phenyl-
O-[(methylamino)carbonyl] oxime	Ethanamine, N-ethyl-N-nitroso-
O,O-Dimethyl O-(<i>p</i> -nitrophenyl) phosphate	Ethanamine, N-methyl-N-nitroso-
O,O-Dimethyl O-(<i>p</i> -nitrophenyl) phosphothioate	1,2-Ethanediamine, N,N-dimethyl-N'-(2-pyridinyl)-N'- (2-thienylmethyl)-
Dimethylnitrosamine	Ethane, 1,2-dibromo-
Dimethyl paroxon	Ethane, 1,1-dichloro-
2,4-Dimethylphenol	Ethane, 1,2-dichloro-
	1,2-Ethanediylbiscarbamodithioic acid, salts and esters
	Ethane, 1,1,1,2,2,2-hexachloro-
	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro]-
	Ethanenitrile
	Ethane, 1,1'-oxybis-
	Ethane), 1,1'-oxybis(2-chloro-
	Ethane, pentachloro-
	Ethane, 1,1,1,2-tetrachloro-

Ethane, 1,1,2,2-tetrachloro-	Freon 113
Ethanethioamide	Freon 12
Ethane, 1,1,2-trichloro-	Fulminic acid, mercury(II) salt
Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-	Fumazone
Ethene, chloro-	Furan
Ethene, 2-chloroethoxy-	2-Furancarboxaldehyde
Ethene, 1,1-dichloro-	2,5-Furandione
Ethene, <i>trans</i> -1,2-dichloro-	Furan, tetrahydro-
Ethene, 1,1,2,2-tetrachloro-	Furfural
Ethanimidothioic acid, N-[(methylamino- carbonyl)oxy]-, methyl ester	Furfuran
Ethanol, 2,2'-(nitrosimino)bis	Fyrol HB 32
Ethanone, 1-phenyl-	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-
Ethanoyl chloride	Glycerol trinitrate
2-Ethoxyethanol	Glycidylaldehyde
Ethyl acetate	Guanidine, N-methyl-N'-nitro-N-nitroso-
Ethyl acrylate	Halon 1001
Ethyl carbamate (urethane)	Heptachlor
Ethyl cellosolve	HETP
Ethyl cyanide	Hexachlorobenzene
Ethyl 4,4'-dichlorobenzilate	Hexachlorobutadiene
Ethyleneimine	Hexachlorodibenzo- <i>p</i> -dioxin
Ethylenebis(dithiocarbamic acid), salts and esters	Hexachlorodibenzofuran
Ethylene dibromide	Hexachlorocyclohexane (gamma isomer)
Ethylene dichloride	Hexachlorocyclopentadiene
Ethylene glycol monoethyl ether	Hexachloroethane
Ethylene oxide	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro -1,4-endo,endo-5,8-dimethanonaphthalene
Ethylene thiourea	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro -1,4-endo,exo-5,8-dimethanonaphthalene
Ethyl ether	Hexachlorophene
Ethylidene dichloride	Hexachloropropene
Ethyl methacrylate	Hexaethyl tetraphosphate
Ethyl methanesulfonate	Hydrazine
Ethyl 2-methyl-2-propenoate	Hydrazinecarbothioamide
Ethyl paraoxon	Hydrazine, 1,2-diethyl-
Ethyl parathion	Hydrazine, 1,1-dimethyl-
Ethyl 2-propenoate	Hydrazine, 1,2-dimethyl-
Famphos	Hydrazine, 1,2-diphenyl-
Famphur	Hydrazine, methyl-
Ferric dextran	Hydrocyanic acid
Firemaster T23P	Hydrofluoric acid
Flammex T23P	Hydrogen cyanide
Fluoranthene	Hydrogen fluoride
Fluorine	Hydrogen phosphide
Fluoroacetamide	Hydrogen sulfide
Fluoroacetic acid, sodium salt	Hydroperoxide, 1-methyl-1-phenylethyl-
Fluorotrchloromethane	Hydroxydimethylarsine oxide
Formaldehyde	2-Hydroxy-2-methylpropionitrile
Formic acid	
Freon 11	

Imidazolidinethione	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-
Indeno[1,2,3-cd]pyrene	octachloro-2,3,3a,4,7,7a-hexahydro-
Iodomethane	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-
Iron dextran	heptachloro-3a,4,7,7a-tetrahydro-
Isobutyl alcohol	Methanol
Isocyanic acid, methyl ester	Methapyrilene
Isodemeton	Methomyl
Isodrin	Methoxychlor
Isopropyl phosphorofluoridate	Methyl alcohol
Isosafrole	Methyl bromide
Isosystox	2-Methylaziridine
3(2H)-Isoxazolone, 5-(aminomethyl)-	1-Methylbutadiene
Kepone	Methyl chloride
Lasiocarpine	Methyl chlorocarbonate
Lead acetate	Methylchloroform
Lead phosphate	Methyl chloroformate
Lead subacetate	3-Methylcholanthrene
Lindane	2-Methyl-4,6-dinitrophenol
Maleic anhydride	4,4'-Methylenebis(2-chloroaniline)
Maleic hydrazide	2,2'-Methylenebis(2,4,6-trichlorophenol)
Malononitrile	Methylene bromide
Mancozeb	Methylene chloride
Maneb	Methylene oxide
MEK	Methyl ethyl ketone
Melphalan	Methyl ethyl ketone peroxide
Mercaptobenzene	Methyl hydrazine
Mercury	Methyl iodide
Mercury, acetoxy phenyl-	Methyl isocyanate
Mercury fulminate	Methyl isobutyl ketone
Methacrylonitrile	2-Methylactonitrile
Methanamine, N-methyl-	Methyl mercaptan
Methane, bromo-	Methyl methacrylate
Methane, chloro-	Methyl 2-methyl-2-propenoate
Methane, chloromethoxy-	2-Methyl-2-(methylthio)propionaldehyde
Methane, dibromo-	O-(methylcarbamoyl)oxime
Methane, dichloro-	N-methyl-N'-nitro-N-nitrosoguanidine
Methane, dichlorodifluoro-	Methyl paraoxon
Methane, iodo-	Methyl parathion
Methane, oxybis(chloro)-	4-Methyl-2-pentanone
Methanesulfonic acid, ethyl ester	2-Methylpropanol
Methane, tetrachloro-	Methyl 2-propenoate
Methane, tetranitro-	2-Methylpropenenitrile
Methanesulfonyl chloride, trichloro-	(S)-3-(1-Methyl-2-pyrrolidinyl)pyridine
Methane, trichlorofluoro-	6-Methyl-2-thiouracil
Methanethiol	MIBK
Methane, tribromo-	Mitomycin C
Methane, trichloro-	MNNG
Methanoic acid	Nabam
	Naphthalene

2-Naphthalenamine, N,N'-bis(2-chloroethyl)-
 Naphthalene, 2-chloro-
 1,4-Naphthalenedione
 5,12-Naphthacenedione,
 (8S-cis)8-acetyl-10-[(3-amino-2,3,6-trideoxy-
 α -L-lyxo-hexopyranosyl) oxy]-[7,8,9,10
 tetrahydro-6,8,11-trihydroxy- 1-methoxy-
 2,7-Naphthalenedisulfonic acid), 3,3'-
 [3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl]
 bis(azo)bis(5-amino-4-hydroxy-, tetrasodium
 salt
 2-Naphthylamine
 1,4-Naphthoquinone
 a-Naphthylamine
 1-Naphthylamine
 β -Naphthylamine
 α -Naphthylthiourea
 Nemafox
 Nemafox
 Nemagon
 Nickel carbonyl
 Nickel cyanide
 Nickel(II) cyanide
 Nicocide
 Nicotine and salts
 Nickel tetracarbonyl
p-Nitroaniline
 Nitric oxide
 Nitrobenzene
 Nitrogen(II) oxide
 Nitrogen dioxide
 Nitrogen(IV) oxide
 Nitroglycerine
p-Nitrophenol
 2-Nitropropane
 N-Nitrosodi-*n*-butylamine
 N-Nitrosodiethanolamine
 N-Nitrosodiethylamine
 N-Nitrosomethylamine
 N-Nitrosomethylvinylamine
 N-Nitroso-*n*-propylamine
 N-Nitroso-N-ethylurea
 N-Nitroso-N-methylurea
 N-Nitroso-N-methylurethane
 N-Nitrosopiperidine
 N-Nitrosopyrrolidine
 5-Nitro-*o*-toluidine
 5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-
 hexachloro-, cyclic sulfite
 Octachlorocamphene
 Octamethylpyrophosphoramidate
 Octamethyltetramido pyrophosphate
 Ortho N-4 dust
 Osmium oxide
 Osmium tetroxide
 7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid
 1,2-Oxathiolane-2,2-dioxide
 2H-1,3,2-Oxazaphosphorin, 2-[bis(2-chloroethyl)
 amino]-tetrahydro-, 2-oxide
 Oxirane
 Oxirane, 2-(chloromethyl)-
 Paraldehyde
 Paraoxon
 Paraoxon-Methyl
 Parathion
 Pentachlorobenzene
 Pentachlorodibenzo-*p*-dioxin
 Pentachlorodibenzofuran
 Pentachloroethane
 Pentachloronitrobenzene
 Pentachlorophenol and its 2-(pentachlorophenoxy)
 carboxylic acid derivatives, esters, ethers,
 amines and other salts
 1,3-Pentadiene
 Perchloroethylene
 Phenacetin
 Phenol
 Phenol, 2-chloro-
 Phenol, 4-chloro-3-methyl-
 Phenol, 2-cyclohexyl-4,6-dinitro-
 Phenol, 2,4-dichloro-
 Phenol, 2,6-dichloro-
 Phenol, 2,4-dimethyl-
 Phenol, 2,4-dinitro-
 Phenol, 2-methyl-4,6-dinitro-, and salts
 Phenol, 2-(1-methylpropyl)-4,6-dinitro-
 Phenol, 4-nitro-
 Phenol, pentachloro-
 Phenol, 2,3,4,6-tetrachloro-
 Phenol, 2,4,5-trichloro-
 Phenol, 2,4,6-trichloro-
 Phenol, 2,4,6-trinitro-, ammonium salt
 Phentermine
 L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
 Phenylarsonous chloride
 Phenyldichloroarsine

Phenyl mercaptan
 Phenylmercuric acetate
 N-Phenylthiourea
 Phorate
 Phosgene
 Phosphine
 Phosphoric acid, lead(II) salt
 Phosphoric acid, diethyl, 4-nitrophenyl ester
 Phosphoric sulfide
 Phosphorodithioic acid, O,O-diethyl S-methyl ester
 Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
 Phosphorofluoric acid, bis(1-methylethyl) ester
 Phosphorothioic acid, O,O-diethyl S-(ethylthio)ethyl ester
 Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
 Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
 Phosphorothioic acid, O,O-dimethyl O-[*p*-(dimethylaminosulfonyl)phenyl] ester
 Phosphorus pentasulfide
 Phosphorus sulfide
 Plantfume 103 Smoke Generator
 Phthalic anhydride
 2-Picoline
 Plumbane, tetraethyl-
 Potassium cyanide
 Potassium biscyanoargentate
 Potassium silver cyanide
 Pronamide
 1-Propanamine
 1-Propanamine, N-propyl-
 Propanal, 2-methyl-2(methylthio)-, O-[(methylamino)carbonyl]oxime
 Propane, 1,2-dibromo-3-chloro-
 Propanedinitrile
 Propanenitrile
 Propanenitrile, 3-chloro-
 Propanenitrile, 2-hydroxy-2-methyl-
 Propane, 2-nitro-
 Propane), 2,2'-oxybis(2-chloro-
 1,3-Propane sultone
 1,2,3-Propanetriol, trinitrate
 1-Propanol, 2,3-dibromo-, phosphate (3:1)
 1-Propanol, 2,3-epoxy-
 1-Propanol, 2-methyl-
 2-Propanone
 2-Propanone, 1-bromo-
 Propargyl alcohol
 2-Propenal
 2-Propen-1-ol
 2-Propenamamide
 Propene, 1,3-dichloro-
 1-Propene, 1,1,2,3,3,3-hexachloro-
 2-Propenenitrile
 2-Propenenitrile, 2-methyl-
 2-Propenoic acid
 2-Propenoic acid, ethyl ester
 2-Propenoic acid, 2-methyl-, ethyl ester
 2-Propenoic acid, 2-methyl-, methyl ester
n-Propylamine
 Propylene dichloride
 Propylenimine
 2-Propyn-1-ol
 4-Pyridinamine
 Pyridine
 Pyridine, hexahydro-N-nitroso
 Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts
 Pyridine, 2-methyl-
 2,4-(1H,3H)-Pyrimidinedione,
 5-[bis(2-chloroethyl)amino]-
 4-(1H)-Pyrimidone,
 2,3-dihydro-6-methyl-2-thioxo-
 Pyrophosphoric acid, tetra ethyl ester
 Pyrrole, tetrahydro-N-nitroso-
 Reserpine
 Resorcinol
 Saccharin and salts
 Safrole
 Schradan
 Selenious acid
 Selenium dioxide
 Selenium disulfide
 Selenourea
 L-Serine, diazoacetate ester
 Silver cyanide
 Silvex (2,4,5-TP)
 Sodium azide
 Sodium cyanide
 Sodium fluoroacetate
 4,4'-Stilbenediol, a,a'-diethyl-
 Streptozotocin
 Strontium sulfide
 Strychnidin-10-one, and salts
 Strychnine

Strychnin-10-one, 2,3-dimethoxy-
 STRZ
 Sulfotepp
 Sulfur hydride
 Sulfuric acid, dimethyl ester
 Sulfuric acid, thallium (I) salt
 Sulfur phosphide
 Sulfur selenide
 2,4,5-T
 TDI
 TEDTP
 Temik
 1,2,4,5-Tetrachlorobenzene
 1,1,1,2-Tetrachloroethane
 1,1,2,2-Tetrachloroethane
 Tetrachlorodibenzo-*p*-dioxin
 Tetrachlorodibenzofuran
 Tetrachloroethene
 Tetrachloroethylene
 2,3,4,6-Tetrachlorophenol
 Tetrachlorophenol and its 2-(tetrachlorophenoxy)
 carboxylic acid derivatives, esters, ethers,
 amines and other salts
 Tetraethyldithiopyrophosphate
 Tetraethyllead
 Tetraethyl pyrophosphate
 Tetrahydrofuran
 Tetramethylthiuram disulfide
 Tetranitromethane
 Tetraphosphoric acid, hexaethyl ether
 Thallic oxide
 Thallium(I) acetate
 Thallium(I) carbonate
 Thallium(I) chloride
 Thallium(I) nitrate
 Thallium(I) selenite
 Thallium(I) sulfate
 Thallium(III) oxide
 Thioacetamide
 Thiodemeton
 Thiofanox
 Thioimidodicarbonic diamide
 Thiomethanol
 Thiophenol
 Thiosemicarbazide
 Thiourea
 Thiourea, (2-chlorophenyl)-
 Thiourea, 1-naphthalenyl-
 Thiourea, phenyl-
 Thiram
 Toluene
 Toluenediamine
 Toluene diisocyanate
o-Toluidine
p-Toluidine
o-Toluidine hydrochloride
 Toxaphene
 1H-1,2,4-Triazol-3-amine
 1,1,1-Trichloro-2,2-bis(*p*-chlorophenyl)ethane
 1,1,1-Trichloro-2,2-bis(*p*-methoxyphenyl)ethane
 1,1,1-Trichloroethane
 1,1,2-Trichloroethane
 Trichloroethene
 Trichloroethylene
 Trichlorofluoromethane
 1,1,2-Trichloro-1,2,2-trifluoroethane
 Trichloromethylsulfenyl chloride
 Trichloromonofluoromethane
 Trichlorophenol and its 2-(trichlorophenoxy)-
 carboxylic acid derivatives
 2,4,5-Trichlorophenol and its
 2-(2,4,5-trichlorophenoxy) carboxylic acid
 derivatives, esters, ethers, amines and other salts
 2,4,6-Trichlorophenol
 1,3,5-Trinitrobenzene
 1,3,5-Trioxane, 2,4,6-trimethyl-
 Tris-BP
 Tris(2,3-dibromopropyl) phosphate
 Tris (Flame retardant)
 Trypan blue
 Uracil, 5-[bis(2-chloromethyl)amino]-
 Uracil mustard
 Urethane
 Vanadic acid, ammonium salt
 Vanadium pentoxide
 Vanadium(V) oxide
 Vinyl chloride
 Vinylidene dichloride
 Warfarin and salts
 Xylene
 Yohimban-16-carboxylic acid, 11,17-dimethoxy-
 18- [(3,4,5-trimethoxybenzoyl)oxy]-,
 methyl ester, (3 β ,16 β ,17 α ,18 β ,20 α)-
 Zanosar
 Zinc cyanide
 Zinc phosphide
 Zineb
 Zinophos