Annex 1: Hazardous Waste Determinations

This section outlines how Indiana University Environmental Health and Safety (IUEHS) determines if waste is regulated by the Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA). All chemical waste should be managed as hazardous unless otherwise indicated in this Guide, or you have been instructed by IUEHS for the respective campus that it is non-hazardous. IUEHS for the respective campus will make the regulatory determination for all waste, and manage it accordingly.

RCRA, as enforced by the EPA and Indiana Department of Environmental Management (IDEM) classifies waste as hazardous if it:

- Is a listed hazardous waste (specifically identified by an alpha-numeric code from one of four lists maintained by EPA) **or**,
- Exhibits certain hazardous characteristics (also identified with an alpha-numeric code) as determined by standardized testing procedures.

Hazardous Waste Characteristics

There are four main characteristics that the EPA has determined parameters for identifying through testing. RCRA also established regulatory limits for the toxicity characteristic for a defined list of materials. IUEHS evaluates each incoming waste material for these characteristics, and assigns the alpha-numeric codes to the waste when appropriate. In part, these codes are used to track the nature, volume, and off-site treatment requirements of hazardous waste generated by the University.

Ignitability

Ignitable wastes are capable of causing or intensifying a fire during routine handling. A waste exhibits the ignitable characteristic when it is any of the following:

- A liquid with a flash point less than 140^{o} F (60 ^{o} C);
- A solid under standard temperature and pressure capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes; and when ignited, burns vigorously and persistently;
- An ignitable compressed gas; or
- An oxidizer.

Corrosivity

Corrosive wastes include highly acidic or highly alkaline chemicals and those that are capable of corroding metal. A waste has the characteristic of being corrosive if it is any of the following:

- Aqueous waste with pH 2.5 or less, OR pH 12.5 or greater;
- A liquid that corrodes steel at a rate greater than 6.35mm (0.25 inches) per year.

If a waste exhibits ONLY the corrosive characteristic, and is NOT a listed waste, it may be neutralized before disposal to the sanitary sewer (see Attachment A). When in doubt, or if neutralization is not feasible, IUEHS for the respective campus should manage the waste.

Reactivity

Reactive wastes are unstable under normal conditions. A waste is regulated for the reactive characteristic if it:

- Is normally unstable and readily undergoes violent change without detonating;
- Reacts violently with water;
- Forms potentially explosive mixtures with water;
- Mixes with water to generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment;
- 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 present a danger to human health or the environment;
- Is capable of detonation or explosive reaction if subjected to a strong initiating source or heated under confinement;
- Is readily capable of detonation or explosive; or
- Is a forbidden explosive or a Class A or Class B explosive.

Toxicity

Toxicity is determined by the "toxicity characteristic leachate procedure" (TCLP); a laboratory test that measures the concentration of a toxic material that could leach into ground water if the waste is improperly managed. The TCLP must be conducted on waste that contains any of the specified TCLP contaminants, unless knowledge of the waste can demonstrate the waste will not exhibit a contaminant TCLP concentration above the regulatory level set by the EPA. IUEHS assumes any waste that contains TCLP contaminants is at or above the regulatory limit, unless we have conducted sample analysis to determine that it is not. Any waste that contains these compounds must be disposed through IUEHS for the respective campus.

TCLP contaminants and their regulatory levels are found in the table on the following page.

Listed Hazardous Waste

EPA defines some chemicals as hazardous by name or description using four lists within the RCRA regulations and can be found at http://www.epa.gov/waste/hazard/wastetypes/listed.htm. It is not necessary to know all of the materials on these lists because IUEHS makes the determination whether or not a waste meets the definition of hazardous. However, it ***IS*** important for to accurately describe waste for disposal so that we have all of the information necessary to make a correct waste determination.

It is also important to note that RCRA requires collection and disposal of the original, empty product containers as regulated hazardous waste for materials on one list; the "P-list" for *acutely toxic commercial products.* The P-list is found here on the EPA website.

RCRA Characteristic Waste and Regulatory Levels

Contaminant	Regulatory Level (mg/L)	EPA Hazardous Waste Code
Arsenic	5.0	D004
Barium	100.0	D005
Benzene	0.5	D018
Cadmium	1.0	D006
Carbon Tetrachloride	0.5	D019
Chlordane	0.03	D020
Chlorobenzene	100.0	D021
Chloroform	6.0	D022
Chromium	5.0	D007
o-Cresol	200.0	D023
m-Cresol	200.0	D024
p-Cresol	200.0	D025
Cresols	200.0	D026
2,4-D	10.0	D016
1,4-Dichlorobenzene	7.5	D027
1,2-Dichloroethane	0.5	D028
1,1-Dichloroethylene	0.7	D029
2,4-Dinitrotoluene	0.13	D030
Endrin	0.02	D012
Heptachlor	0.008	D031
Hexachlorobenzene	0.13	D032
Hexachlorobutadiene	0.5	D033
Hexachloroethane	3.0	D034
Lead	5.0	D008
Lindane	0.4	D013
Mercury	0.2	D009
Methoxychlor	10.0	D014
Methyl Ethyl Ketone	200.0	D035
Nitrobenzene	2.0	D036
Pentachlorophenol	100.0	D037
Pyridine	5.0	D038
Selenium	1.0	D010
Silver	5.0	D011
Tetrachloroethylene	0.7	D039
Toxaphene	0.5	D015
Trichloroethylene	0.5	D040
2,4,5-Trichlorophenol	400.0	D041
2,4,6-Trichlorophenol	2.0	D042
2,4,5-TP (Silvex)	1.0	D017
Vinyl Chloride	0.2	D043