



IB GUIDELINES FOR WASTE DISPOSAL

Notes:

It is highly encouraged to practice measures that will minimize generation of wastes. Recycling of materials is strongly advised. Preparation of reagents, chemical solutions or other lab materials should be properly estimated to avoid excessive amounts or errors that may lead to generation of wastes. Similarly, correct techniques in handling disposables should be practiced to avoid unnecessary wastage.

Non-hazardous Ecological solid wastes

1. Non-hazardous ecological wastes include **compostable, recyclable, residual** wastes as defined in RA 9003 (see below).
2. Wastes should be kept in designated bins/containers with sealable garbage bags.
3. Solid wastes should be separated from liquid wastes (see disposal of liquid waste below).
4. Recyclables should be emptied/rinsed before throwing in the garbage bag.
5. Animal wastes (tissues, carcasses) that are not contaminated with infectious materials/hazardous chemicals should be packed in sealable garbage bags and stored in freezer until collection. Laboratory in-charge should inform assigned personnel about the waste so that it can be collected immediately. Animal wastes should be stored in freezers if not collected immediately.
6. Lab wastes that do not contain hazardous materials or are decontaminated and are thus considered non-hazardous (e.g. used disposable tubes, gloves), etc. shall be treated as residual wastes.
7. Non-hazardous solid wastes are collected regularly by assigned personnel and will be disposed through the QC garbage collection services.
8. Lab wastes such as decontaminated nutrient agar shall be treated as compostable waste as long as immediate disposal is arranged. Labs should sync decontamination with the schedule of regular pick up of garbage. Decontaminated nutrient agar should be packed into smaller containers to avoid questioning from QC garbage collectors. If decontaminated agar weighs 5 kgs or more, a special pick up can be arranged by filling out **Waste Collection Form 1** and submit to PCO (zgaorozco@up.edu.ph) for evaluation and approval. To avoid recontamination of agars, application for collection should be properly synced with decontamination.

Non-hazardous liquid wastes (Household and chemical wastes)

1. Non-hazardous liquid wastes are wastes that are not listed or with concentrations that are outside the restricted limit as prescribed in **DAO 2013-22 Table 2.1 Classification of Hazardous Waste**.

Example: Methanol - Class G (Waste Organic Solvents) / non-halogenated organic solvent, waste number G704 – only considered hazardous when more than 10% by volume of solvent is present in waste. Thus, a diluted methanol waste with less than 10% by volume solvent is considered non-hazardous.

2. It is recommended that non-hazardous chemical wastes should be diluted (at least 100 volumes of excess water) and disposed through the laboratory sinks/drains with running water.
3. **Non-hazardous chemical wastes** should be separated from hazardous chemicals to avoid contamination.
4. Non-hazardous liquid household wastes such as drinks, soup etc. can be disposed in sinks with running water and strainer to avoid clogging of drains.

Hazardous wastes

1. Hazardous wastes are **chemical** and **biological wastes** listed in **DAO 2013-22 Table 2.1 Classification of Hazardous Waste** including **special waste** defined in RA 9003 and **other Hazardous wastes** as defined below.
2. Identify the waste as described in Table 2.1. If the chemical or biological waste is not found in the **Classification of Hazardous Waste** or if the concentration is below the restriction limit, it will be treated as non-hazardous waste.
3. Chemical and biological wastes should be stored in suitable containers (non-reactive, leak-proof, tear resistant and sealable). Examples are carboys, used chemical bottles and special buckets.
4. Do not combine incompatible chemical wastes in the same container. Incompatible chemical wastes can create violent reactions and can produce more toxic compounds.

5. Anything that is capable of cutting or puncturing (i.e. sharps include needles, syringes, razor blades, slides, scalpels, pipettes, broken plastic or glassware, micropipettes and pipette tips) must be placed in a sharps container.
6. Each lab will store the waste containers in a safe and dry area before collection.
9. Biological wastes such as infected animal tissues, carcasses should be placed in garbage bags and stored temporarily in the freezer until collection.
10. All waste containers should be labelled using the prescribed DENR forms.
11. Each lab should keep an updated inventory of wastes. DENR requires quarterly self-monitoring report (SMR) from waste generators.
12. For waste collection, laboratory in-charge should fill-out **IB_Waste Collection_Form 2** and submit to PCO (zgaorozco@up.edu.ph).
13. PCO and assigned personnel will check the form and waste containers and labels before approval of collection to ensure proper packing and labelling.
14. Once application is approved, assigned personnel will collect waste containers and store in IB waste storage.
15. Hazardous wastes will be collected by a 3rd party hazardous waste transporters accredited by DENR.

Definition of terms

Ecological wastes – categorized into 4 types including compostable, recyclable, residual, and special wastes.

Compostable wastes – biodegradable wastes such as food waste, garden waste and animal waste (Fruit and vegetable peelings, leftover foods, vegetable trims, fish/fowl/meat/animal entrails/, soft shells, seeds, leaves, etc.)

Recyclable wastes – waste materials retrieved from waste stream and free from contamination that can still be converted into suitable beneficial use (Newspaper, ferrous and non-ferrous scrap metals, corrugated cardboard, aluminum, tin cans, glass, papers, etc.,

Non-recyclable/residual wastes – Residual wastes are solid waste materials that are non-compostable and non-recyclable. (Sanitary napkins, disposable diapers, worn-out rugs, ceramics, candy wrappers/sachets, cartons which contain a plastic lining usually used for milk and juice containers, etc.)

Special wastes – refer to hazardous household wastes (Paints, thinner, household batteries, lead-acid batteries, spray canisters, bulky wastes, consumer electronics (which refer to worn-out, broken and other discarded items), white goods (which refer to large worn-out or broken household appliances), oil, tires, etc.,

Hazardous wastes – Hazardous waste (as defined in Revised Procedures and Standards for the Management of Hazardous Wastes) are by-products, side-products, process residues, spent reaction media, contaminated plant or equipment or other substances from manufacturing operations and as consumer discards of manufactured products which present unreasonable risk and/or injury to health and safety to the people or to the environment.

In this guideline, a waste is classified as hazardous if it is “listed” or has hazardous characteristic as prescribed in **DAO 2013-22, Table 2.1 Classification of Hazardous Waste** in the revised procedures and standards for management of hazardous waste (DAO 2004-36).

“Other hazardous wastes” – Wastes that are generated from research analysis/experiments that are not listed in the DAO 2013-22 Table 2.1 Classification of Hazardous Waste but exhibits one or more of the characteristics of hazardous waste and poses risk to health and safety to people and environment. Example of this type of waste are wastes generated from genetic modification studies.

- Are they toxic, corrosive, ignitable, reactive?
- Are they infectious?
- Are they contaminants?

Non-hazardous liquid wastes – These are wastes that are not listed or with concentrations that are outside the restricted limit as prescribed in DAO 2013-22 Table 2.1 Classification of Hazardous Waste. These are substances, materials, or by-products that are non-toxic, non-corrosive, non-ignitable, non-reactive, not infectious and are considered safe to human and the environment.

Biological wastes – wastes generated by laboratories or research activities that are contaminated by *biohazardous agent*. Biological wastes include blood and blood products, pathological waste, cultures and stocks of infectious agents and associated biologicals, animal carcasses and bedding, sharps, and biotechnology by-product effluents (i.e., recombinant DNA), as well as laboratory consumables.

Biohazardous agents – Biohazardous agent refers to an agent that is biological in nature, and that poses a threat to the health of organisms, primarily humans. Biohazardous agents include, but are not limited to; bacteria, fungi, viruses, parasites, recombinant products, allergens, cultured human and animal cells (and the potentially biohazardous agents these cells may contain), infected clinical specimens, toxins and tissues from experimental animals, and the like.

Chemical wastes – any solid, liquid, or gaseous waste material that contains or is contaminated with chemicals. Hazardous chemical wastes are wastes that may pose substantial hazards to human health and the environment and must be disposed by a licensed third party. Examples of hazardous chemicals are presented in Table 2. Non-hazardous chemicals can be safely diluted and disposed through the drain. Examples of non-hazardous chemicals are alcohols, amides, amines and carboxylic acids.

DAO 2013-22

The DAO 2013-22 is an administrative order containing Revised Procedures and Standards for the Management of Hazardous Wastes (revising Dao 2004-36). This procedural manual developed by the Department of Environment and Natural Resources (DENR) as a response to the increasing problems associated with toxic chemicals as well as hazardous and nuclear wastes. It provides a clear, sufficient, and updated information about compliance with the legal and technical requirements of the hazardous waste management. Classification of Hazardous Waste (Table 2.1) is included in this manual.

Republic Act (RA) #9003

RA #9003 is also called the Ecological solid waste management act of 2000 – an act providing for an Ecological Solid Waste Management Program, creating the necessary institutional mechanisms and incentives, declaring certain acts prohibited and providing penalties, appropriating funds, there of, and for other purposes. This act further aims to ensure the protection of public health and environment and maximize the utilization of valuable resources and encourage resources conservation and recovery.

Table 1 (Table 2.1 Classification of Hazardous Wastes, DAO 2013-22 (Revised Procedures and standards for the management of Hazardous Waste, Revising DAO 2004-36)

Class	Description	Waste Number
A: Wastes with Cyanide		
Wastes with Cyanide	containing cyanide with concentration > 70 mg/L in liquid waste.	A101
B: Acid Wastes		
Sulfuric acid	Sulfuric acid with pH \leq 2.0	B201
Hydrochloric acid	Hydrochloric acid with pH \leq 2.0	B202
Nitric acid	Nitric acid with pH \leq 2.0	B203
Phosphoric acid	Phosphoric acid with pH \leq 2.0	B204
Hydrofluoric acid	Hydrofluoric acid with pH \leq 2.0	B205
Mixture of sulfuric and hydrochloric acid	Mixture of sulfuric and hydrochloric acid with pH \leq 2.0	B206
Other inorganic acid	Other inorganic acid with pH \leq 2.0	B207
Organic acid	Organic acid with pH \leq 2.0	B208
Other acid wastes	Acid wastes other than B201 to B208 with pH \leq 2.0	B299
C: Alkali Wastes		
Caustic soda	Caustic soda with pH \geq 12.5	C301
Potash	Potash with pH \geq 12.5	C302
Alkaline cleaners	Alkaline cleaners with pH \geq 12.5	C303
Ammonium hydroxide	Ammonium hydroxide with pH \geq 12.5	C304
Lime slurries	Lime slurries with pH \geq 12.5	C305
Other alkali wastes	Alkali wastes other than C301 to C305 pH \geq 12.5	C399
D: Wastes with Inorganic Chemicals		
Selenium and its compounds*	Includes all wastes with a total Se concentration > 1 mg/L based on analysis of an extract	D401
Arsenic and its compounds*	Includes all wastes with a total As concentration > 1 mg/L based on analysis of an extract	D402
Barium and its compounds*	Includes all wastes with a total Ba concentration > 70 mg/L based on analysis of an extract	D403
Cadmium and its compounds*	Includes all wastes with a total Cd concentration > 0.3 mg/L based on analysis of an extract	D404
Chromium compounds*	Includes all wastes with a total Cr concentration > 5 mg/L based on analysis of an extract	D405
Lead compounds*	Includes all wastes with a total Pb concentration > 1 mg/L based on analysis of an extract	D406
Mercury and mercury compounds*	Includes all wastes with a total Hg concentration > 0.1 mg/L based on analysis of an extract. These also include organomercury compounds. Refer to CCO.	D407
Fluoride and its compounds*	Includes all wastes with a total F concentration > 100 mg/L based on analysis of an extract	D408

Other wastes with inorganic chemicals	Wastes having as constituents or contaminants any of the following: <ul style="list-style-type: none"> • Antimony; antimony compounds • Beryllium; beryllium compounds • Tellurium; tellurium compounds • Thallium; thallium compounds • Metal carbonyls • Hexavalent chromium compounds • Copper compounds • Zinc compounds 	D499
E: Reactive Chemical Wastes		
Oxidizing agents	Includes all wastes that are known to contain oxidizing agents in concentration that cause the waste to exhibit any of the following properties: <ul style="list-style-type: none"> • It is normally unstable and readily undergoes violent change without detonating • It reacts violently with water • It forms potentially explosive mixtures with water • When mixed with water, it generates toxic gases, vapor or fumes in a quantity sufficient to present a danger to human health <p>It is a cyanide (CN) or sulfide (S) bearing wastes, which when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors and fumes in a quantity that poses a danger to human health</p>	E501
Reducing agents	Includes all wastes that are known to contain reducing agents in concentration that cause the waste to exhibit any of the following properties: <ul style="list-style-type: none"> • It is normally unstable and readily undergoes violent change without detonating • It reacts violently with water • It forms potentially explosive mixtures with water • When mixed with water, it generates toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health <p>It is a cyanide (CN) or sulfide (S) bearing wastes, which when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors and fumes in a quantity that poses a danger to human health</p>	E502
Explosive and unstable chemicals	Includes all wastes that are 1) capable of detonation or explosive reaction when subject to a strong initiating source or when heated under confinement, or 2) capable of detonation or explosive decomposition at a temperature of 20°C and Pressure of 1 atm.	E503
Highly reactive chemicals	Includes all other wastes that exhibit any of the properties described for D501, D502, and D503.	E599
F: Inks/Dyes/Pigments/Paint/ Resins/Latex/Adhesives/Organic Sludge		
Solvent based	Includes all solvent based wastes that also meet one or more of the subcategories	F601
Inorganic pigments	Includes all wastewater treatment sludge from the production of inorganic pigments	F602
Ink formulation	Includes all solvent washings and sludge, caustic washings and sludge or wastewater and sludge from cleaning of tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing Chromium and Lead.	F603
Resinous materials	Waste resins generated, but not limited to, water purification processes	F604
Other mixed	Other mixtures with above constituents other than aqueous	F699
G: Waste Organic Solvents		
Halogenated organic solvents	Includes, but not limited to the following spent halogenated solvents as well as those listed in the Priority Chemical List (PCL): Tetrachloroethylene; Trichloroethylene; Methylene chloride; 1,1,1-Trichloroethane; Carbon Tetrachloride; Chlorobenzene; 1,2,2-Trichloroethane; chlorinated fluorocarbons if they contain a total of 10% or more (by volume) of one or more of the above before use; it	G703

	also includes all still bottoms from recovery of these solvents and solvent mixtures	
Non-halogenated organic solvents	Includes, but not limited to the following spent non halogenated solvents as well as those listed in the Priority Chemical List (PCL) : xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanol, methanol, cresol, cresylic acid, nitrobenzene, toluene, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxy ethanol, and 2-nitropropane and other non-halogenated organic solvents if they contain a total of 10% or more (by volume) of one or more of these solvents before use; it also includes all still bottoms from recovery of these solvents and solvent mixtures	G704
H: Organic Wastes		
Grease wastes	Includes all grease wastes generated from establishments such as industrial, commercial and institutional facilities	H802
I: Oil		
Used or waste oil	Used industrial oil including sludge	I101
	Vegetable oil including sludge	I102
	Tallow	I103
	Oil-contaminated Materials	I104
J: Containers		
Containers previously containing toxic chemical substances	Containers that used to hold hazardous wastes and toxic chemical substances Containers that used to contain polychlorinated biphenyl (PCB) are categorized as L404 and excluded from this sub-category.	J201
K: Stabilized Wastes		
Solidified wastes	Wastes whose hazardous substances are physically immobilized by consolidation to reduce the surface area of the wastes in order to meet the waste acceptance criteria of the disposal facility	K301
Chemically fixed and polymerized wastes	Wastes whose hazardous substances are chemically immobilized through chemical bonds to an immobile matrix or chemical conversion to meet the waste acceptance criteria of the disposal facility	K302
Encapsulated wastes	Wastes whose hazardous substances are physically immobilized by enveloping the waste in a non-porous, impermeable material in order to store or dispose of hazardous wastes in a registered disposal facility	K303
L: Organic Chemicals		
Wastes with specific halogenated toxic organic chemicals	Solid organic chemical wastes listed in the Priority Chemical List (PCL)	L401
Wastes with specific non-halogenated toxic organic chemicals	Solid organic chemical wastes listed in the Priority Chemical List (PCL)	L402
Ozone depleting substances (ODS)	All ODS wastes (refer to CCO)	L403
Polychlorinated Biphenyl (PCB) wastes	All PCB wastes (refer to CCO and Memorandum Circular on the Code of Practice for PCB)	L404
M: Miscellaneous Wastes		
Pathological or infectious wastes	Includes healthcare wastes from hospitals, medical centers and clinics containing pathological, pathogenic and infectious wastes, sharps, and others	M501
Asbestos wastes	All asbestos wastes (refer to CCO)	M502
Pharmaceuticals and drugs Pesticides Persistent Organic Pollutants (POPs) wastes	Expired pharmaceuticals and drugs stocked at producers and retailers' facilities which contain hazardous constituents harmful to the environment such as antibiotics, veterinary and phyto pharmaceuticals and others	M503
	Waste pesticides other than M505. Includes all wastewater sludge with hazardous constituents from production of pesticides other than those listed in M505.	M504
	Wastes listed in the Stockholm Convention on POPs such as, but not limited to, aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, and dichlorodiphenyl trichloroethane (DDT)	M505

	Polychlorinated Biphenyl (PCB) wastes are categorized as L404 and excluded from this sub-category.	
Waste electrical and electronic equipment (WEEE)	Include all waste electrical and electronic equipment that contain hazardous components such as lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) that includes its peripherals i.e., ink cartridges, toners, etc.	M506
Special Wastes	House hold hazardous wastes such as paints, thinners, household batteries, lead-acid batteries, spray canisters and the like that are consolidated by Material Recovery Facilities (MRFs). These include wastes from residential and commercial sources that comprise of consumer electronics, white <i>goods</i> (i.e. refrigerators, washing machines, air conditioners, etc.) batteries, oil and busted lamps	M507

Table 2 (Table 2.2 Exempted Wastes, DAO 2013-22, DENR)

Description
Household wastes such as garbage under RA 9003 except special wastes
Industrial and commercial wastewaters which are disposed of on-site through the sewerage system
Industrial and commercial wastewaters which are do not contain hazardous wastes as identified in Table 2.1
Materials from building demolition except those containing asbestos
Septic tank effluents and associated sullage waste waters
Untreated spoils from mining, quarrying and excavations works but not materials in the nature of tailings, commercially treated materials and mine facility consumables

Table 3 (DAO 2005-27 Revised Priority Chemical Waste)

Please see attachment

References:

DAO 2013-22. Revised Procedures and Standards for the Management of Hazardous Wastes (revising Dao 2004-36). Department of Environment and Natural Resources. (2013, December 04). *Environmental Management Bureau*.

Republic act 9003 – Ecological Solid Waste Management Act. <https://emb.gov.ph/wp-content/uploads/2015/09/RA-9003.pdf>

Hazardous Chemical Waste Container Requirements. <https://ehs.cornell.edu/research-safety/chemical-safety/laboratory-safety-manual/chapter-10-hazardous-chemical-waste-0>

Laboratory Chemical Waste Management Procedures <https://www1.udel.edu/ehs/waste/chemical-waste-management.html>