



HAZARDOUS WASTE PROCEDURE

1. PURPOSE

The University of Notre Dame Hazardous Waste Procedure (HWP) establishes a formal written program for the safe and compliant collection, storage, and disposal of hazardous waste. University of Notre Dame's recommendation is all personnel handle generated wastes as hazardous until determined otherwise and request Risk Management and Safety (RMS) manage the waste.

2. SCOPE

The HWP applies to all laboratories, shops, maintenance areas or other Notre Dame facilities using, storing, or handling hazardous waste. It describes the proper use and handling procedures required by faculty, staff, contractors, and other personnel working with hazardous waste at the University of Notre Dame.

3. DEFINITIONS

- 3.1. Acutely Toxic Hazardous Waste- Any waste listed on the "P List" in [40 CFR Part 261.33](#) plus six wastes on the "F List" of [40 CFR Part 261.31](#) (F020, F021, F023, F026, F027).
- 3.2. Non-Acutely Toxic Hazardous Waste- Any waste not listed on the "P List" in 40 CFR Part
- 3.3. 261.33 or the six wastes listed on the "F List" of 40 CFR Part 261.31 (F020, F021, F023, F026, F027).
- 3.4. Aerosol Can Waste - Pressurized vessels containing a propellant and a product/material, which pose potential risks since the propellant and/or product can be a hazardous material. Aerosol cans are handled as Universal Waste at Notre Dame.
- 3.5. Chemical Discard Tag - A carbon copy paper tag used to identify and label waste containers ready for pickup. It contains 3 sheets [white- RMS, yellow- Dept./Lab, and bottom-container] with a peel-off backing to attach it to a waste container.
- 3.6. Container Label – Waste container label identifying contents. It is placed on the container prior to waste being added to the container.
- 3.7. Environmental Protection Agency (EPA) - Federal level regulatory agency administering the hazardous waste compliance program in the United States of America.
- 3.8. Hazardous Waste - Any material designated as a hazardous waste by the Environmental Protection Agency (EPA), which may include, but is not limited to, undesired or outdated chemicals, spent chemical solutions, chemically contaminated debris or media.
- 3.9. Indiana Department of Environmental Management (IDEM) - State level regulatory agency administering the hazardous waste compliance program in Indiana.
- 3.10. Listed Waste – RCRA term for F, K, P, or U listed wastes that are generated through function specific processes or are material specific.
- 3.11. Mercury-containing Bulbs - Fluorescent, compact fluorescent, neon and high intensity



discharge (HID).

- 3.12. Resource Conservation and Recovery Act (RCRA) - EPA regulation passed by the United States Congress in 1976, which mandates the proper identification, labeling, handling, storage, and disposal of hazardous waste for protection of human health and the environment.
- 3.13. RCRA Deregulated Metals - Ferrous and nonferrous Metals typically recycled or repurposed. Examples include iron, steel and aluminum.
- 3.14. Safety Data Sheet (SDS) - Manufacturer's information providing workers and emergency personnel with procedures for handling or working with that substance in a safe manner, and includes information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.
- 3.15. Satellite Accumulation Areas (SAA) - Regulatory term for any area (e.g., Lab or Shop) which wastes are generated and stored not to exceed 55 gallons of non-acutely toxic hazardous waste or one quart of acutely toxic hazardous waste.
- 3.16. Satellite Accumulation Areas (SAA) Labeling - Tape, paper, and stickers used to identify what is in waste containers being stored in SAAs. These are not Chemical Discard Tags.
- 3.17. Sharps Waste - Items capable of puncturing, cutting, or abrading the skin such as glass or plastic pipettes, broken glass, test tubes, petri dishes, razor blades, needles, and syringes with needles.
- 3.18. Solid Waste - A regulatory term that is very broad and includes both non-hazardous and hazardous waste. According to the EPA's definition, solid waste is garbage, refuse, sludge, industrial waste, or other discarded materials. It is not limited to wastes that are physically solid, but also liquids, semisolids, and gases.
- 3.19. Trace - an amount of a chemical constituent on a chemical discard tag that is less than 1%.
- 3.20. Universal Waste - Is a category of waste materials designated as "hazardous waste", but containing materials that are very common. Universal Waste includes batteries, pesticides, mercury-containing equipment, bulbs containing mercury, and aerosol cans.
- 3.21. Used Oil - Oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result is contaminated by physical or chemical impurities.
- 3.22. Waste Minimization - actions to reduce the amount and/or toxicity of hazardous wastes before they are shipped off-site for disposal.

4. RESPONSIBILITIES

- 4.1. Area Supervisors (e.g., Principal Investigator (PI), shop supervisor) are responsible for:
 - 4.1.1. Managing the hazardous waste program in their area of responsibility in a safe and compliant manner, consistent with this procedure.
 - 4.1.2. Ensuring all employees assigned to the supervisor receive proper instruction and training on hazardous waste handling procedures.
 - 4.1.3. Ensuring all employees' training is documented.
- 4.2. RMS is responsible for:
 - 4.2.1. Disposing of hazardous wastes generated on campus.



- 4.2.2. Assisting in the providing guidance and monitoring environmental, health, and safety regulatory compliance.
- 4.2.3. Providing for the collection and disposal of the University's hazardous waste, conducting waste determinations, maintaining the chemical waste discard tag database, and ensuring effective hazardous waste procedures.
- 4.2.4. Hazardous Waste Procedure annual review.
- 4.2.5. Transporting or arranging the transport of hazardous wastes.

4.3. Waste Generator are responsible for:

- 4.3.1. Handling generated wastes as hazardous unless determined otherwise.
- 4.3.2. Ensuring the proper handling, storage, and disposal of wastes generated, as outlined in this procedure.

5. HAZARDOUS WASTE STORAGE REQUIREMENTS

5.1. Satellite Accumulation Areas (SAA)

- 5.1.1. Any area in which hazardous wastes are generated or stored shall not exceed 55 gallons of hazardous waste or one quart of acutely toxic hazardous waste. Contact RMS for pickup if the volume exceeds 55 gallons of hazardous waste or one quart of acutely hazardous waste (Section 3).
- 5.1.2. Hazardous waste containers generated shall be stored in SAAs.

5.2. SAA Storage Requirements

- 5.2.1. Waste containers shall be stored at or near the point of generation and under the control of the generator.
 - An area to accumulate hazardous waste shall be established.
 - This area can be a bench top, fume hood (should not be a process fume hood), or a cabinet
 - Secondary containment [trays, tubs, totes] shall be used and be large enough to contain 10% of the total volume of the containers or 100% of the volume of the largest container, whichever is greater. Secondary containment for acid waste stored in acid cabinets should not obstruct airflow. Contact RMS for guidance.
 - Waste containers shall not be stored in areas such as hallways, doorways, sinks, next to moving equipment, or in public areas such as classrooms or reception areas.
 - When relocating an existing or establishing a new SAA, the area supervisor shall notify RMS by calling 574-631-9144 of the location and the types of waste being stored in the area.
- 5.2.2. All waste shall be stored in leak-proof containers and kept closed at all times except when adding or removing waste. Utilization of a vented cap may be necessary if there is potential for pressure build-up.

5.3. SAA Hazardous Waste Storage Container Labeling Requirements

- 5.3.1. All waste containers shall be properly labeled before waste enters the container.



Containers shall be labeled and clearly marked with words describing the contents of the waste and the words "Hazardous Waste". The hazards of the wastes shall be identified on the label.

- 5.3.2. Chemical constituents above 1% shall be listed on the container label. For trace amounts (Section 3.19).
- 5.3.3. All known chemical constituents in hazardous waste containers shall be identified by persons knowledgeable of the generation of the waste.
- 5.3.4. If the composition of the waste is unknown, it shall be managed as hazardous and labeled as "Hazardous Waste Pending Analysis" (Section 8.1.1).

6. PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS

6.1. Minimum PPE is required when personnel are in laboratories and non-laboratory spaces with hazards. Hazardous waste PPE requirements for laboratories are stated in the [Chemical Hygiene Plan](#) (CHP). Hazardous waste PPE requirements for non-laboratory spaces can be found in the [Personal Protective Equipment Procedure](#).

7. HAZARDOUS WASTE DISPOSAL PROCEDURES

7.1. RMS provides waste pickup services for all chemical waste generated. Waste pick-ups are scheduled on an as needed basis.

7.2. RMS recommends chemical waste not be held in laboratories for more than 30 days. Waste containers shall be prepared by laboratory personnel for pick up at least every 60 days.

7.3. Special waste pickups shall be requested through email to the Hazardous Materials Specialist at riskman@nd.edu or by calling 574-631-9144. The average turnaround time for requested waste pickups is typically two business days.

7.4. Hazardous Waste Containers

7.4.1. Containers shall be compatible with the waste they contain.

- Do not use metal containers for corrosive waste or glass containers for hydrofluoric acid waste.
- For liquid waste, only use a container designed for liquids; the container shall seal and not leak (no liquids in bags).
- Food grade containers, such as milk jugs and water bottles, shall not be used for chemical storage.

7.4.2. RMS provides these select containers listed below for waste:

- 10-liter and 20-liter carboys for solvent-only waste streams.
- 4-liter glass bottles as available.
- Open top containers with lids of different capacities for solid chemical waste streams only.



- 55-gallon closed top metal drums for liquid waste only.
- 7.4.3. Generators shall supply their own waste containers when RMS provided containers are not appropriate for quantities or types of waste generated. Original containers of the waste stream (e.g. reagent bottle) may be used as long as original labels are defaced and bottle is relabeled accordingly. Refer to Appendix A.
- 7.4.4. All containers shall be in good condition and shall be clean, without chemical contamination on the outside surface.
- If a container holding hazardous waste is not in good condition or if it begins to leak, area personnel shall transfer the hazardous waste to a different container or place whole container into a larger over pack and all leakage and spilled material shall be cleaned up immediately (with consideration for personal safety). The leaking or poor condition container shall be disposed as hazardous waste.
- 7.4.5. Containers shall be segregated by chemical compatibility. (Appendix B)
- 7.4.6. Personnel shall follow the following procedures when disposing of empty containers:
- Empty acutely toxic waste containers shall be managed as hazardous waste, discard-tagged, and picked up by RMS.
 - RMS recommends as a best practice triple rinsing empty containers that will be reused as waste containers with a solvent and/or water capable of removing the original material. Rinsate shall be considered hazardous and collected for disposal by RMS. Triple-rinsed, dry, odorless, and empty reagent containers shall have their labeling and hazard communication defaced (Appendix A) before disposal.
 - 5-gallon metal cans shall have the caps removed prior to disposal.
 - The removal of empty containers shall be arranged with Building Services or taken to the facility's designated disposal area.
 - When residual hazardous materials cannot be removed from the containers, the containers shall be managed as hazardous waste and picked up by RMS for proper disposal.
- 7.5. Hazardous waste containers shall not be picked up by RMS for the following reasons:
- 7.5.1. RMS personnel are unable to gain access to the area.
- 7.5.2. Container is leaking, has been overfilled, or is in an improper container.
- 7.5.3. Improper caps/lids (i.e. foil, parafilm, etc.)
- 7.5.4. Incomplete Chemical Discard Tag:
- Chemical Discard Tag not securely attached to container.
 - Use of chemical formulae or abbreviations.
 - Chemical Discard Tag's chemical description does not match the contents of containers or does not total to 100%.
 - A container's exterior is contaminated, has residual spillage, or is not in good condition.
 - Information on the Chemical Discard Tag is not legible.
- 7.5.5. Corrective actions shall be left on a form by RMS personnel identifying any issues to ensure waste can be picked up on next scheduled pick-up day.



7.6. Chemical Discard Tag Forms (Appendix C).

8. COMMON WASTE TYPES

8.1. Unknown Chemical Waste

Unknown chemicals shall be managed as hazardous waste. Unknowns shall be identified according to hazard class before proper disposal can occur. The hazards that should be noted include: corrosive, flammable, oxidizer, reactive, toxic, and radioactive. The following describes how to properly manage unknown chemicals.

8.1.1. Labeling Unknown Chemicals for Disposal

- The container shall be labeled with a Chemical Discard Tag.
 - “*Hazardous Waste Pending Analysis*” shall be written in the chemical description section on the discard tag.
 - Any observable descriptors, such as pH, color, phase state, organic/aqueous layers, etc. shall be written on the discard tag.
 - If there could be heavy metals present, “*possibly contains heavy metals*” shall be listed on the Chemical Discard Tag.

8.2. Sharps Waste

8.2.1. Clean or Contaminated Sharps

- Sharps waste (clean or contaminated with hazardous chemicals) shall be placed into a puncture resistant sharps container.
- RMS shall pick up sharps containers. Lab personnel shall write the PI name, room/lab number, and department information on the sharps container.

8.2.2. Broken Glass

- Broken glassware and plastic sharps that are clean or have no visible contamination should be placed in a corrugated cardboard box or other strong disposable container. When ready for disposal, the box should be taped shut and prominently labeled as “Broken Glass”. The box shall not exceed a 40-pound weight limit. Building Services handles broken glassware disposal.

8.2.3. Additional information regarding sharps waste, including biologically contaminated sharps, can be found in the [Biosafety Manual](#).

8.3. Broken Mercury-Containing Bulbs

8.3.1. Broken mercury-containing bulbs are hazardous waste.

8.3.2. Broken mercury-containing bulbs shall be swept up and placed in a sealable plastic bag. Please notify RMS that broken mercury-containing bulb has been cleaned up and RMS will pick up the sealed bag of waste. Do not vacuum broken mercury-containing bulbs.

8.4. Biohazardous/Infectious Waste

8.4.1. Infectious waste, i.e. red bags and sharps contaminated with blood, tissue, or



infectious agents, shall be picked up by RMS.

- 8.4.2. See the [Biosafety Manual](#) for more information on biohazardous /infectious waste.

8.5. Radioactive Waste

- 8.5.1. Radioactive waste shall be picked up by RMS. Contact the Radiation Safety Officer at 631-5037 concerning any radioactive materials or waste questions.
- 8.5.2. More information on policies regarding radioactive materials can be found in the [Radiation Safety Manual](#).

8.6. Laboratory Closeout Waste

- 8.6.1. The University of Notre Dame's [Laboratory Closeout Procedure](#) can be found on the RMS website.

8.7. Sink Disposal

- 8.7.1. Aqueous solutions with a pH range 2.5 - 12 can be drain disposed as long as they do not exhibit any exhibit any of the following characteristics ([Flammable](#), [Corrosive](#), [Reactive](#), [Toxic](#)) or contain any listed wastes (Section 3). pH shall be confirmed prior to sink disposal.
- 8.7.2. For aqueous solutions outside of the pH range 2.5 – 12 it is recommended that the waste be collected by RMS for disposal (Section 7). As a non-recommended option, neutralizations can be performed (Appendix D). Note that pH after neutralization must be confirmed prior to sink disposal.
- 8.7.3. If you are unsure, RMS will properly dispose of waste. Please contact RMS at (574) 631-9144 for consultation.
- 8.7.4. Brine, bleached biologicals, saltwater and buffers can be sink disposed.

8.8. Neutralizations

- 8.8.1. Neutralization is not required to be performed by lab personnel, but it is allowed if the neutralization process is followed. (Appendix D).
- 8.8.2. RMS will collect the waste "as is" for proper disposal.

8.9. Liquid Chromatography (LC) Waste

- 8.9.1. LC waste shall be managed as hazardous waste.
- 8.9.2. All containers collecting LC waste shall remain closed or vented while the LC unit is in operation.
- 8.9.3. Appendix E shows several examples of acceptable options for proper LC waste collection available for purchase, as well as acceptable modified caps. The modified cap should be replaced with a regular, unmodified cap once the container is full and ready for RMS pickup.

8.10. Chemical Spills Waste

- 8.10.1. Incidental Spills
- Defined as less than 1 liter or not involving a highly toxic or reactive material, not



presenting a significant fire or environmental hazard, and not being in a public area such as a hallway.

- Incidental spills can be cleaned up by properly trained area personnel using lab-required PPE and using a spill kit. Any spills requiring additional PPE shall be handled as an Emergency Spill (Section 8.10.2).
- Detailed cleanup procedures are included in Section 22.7 of the [Chemical Hygiene Plan](#).
- Spill cleanup supplies such as absorbents and gloves contaminated with hazardous waste spills shall be managed as hazardous waste.
- If chemical exposure to skin or eyes has occurred, the affected personnel should go to the nearest safety shower and/or eyewash station to flush skin and/or eyes for 15 minutes.
- If inhalation hazard, get to fresh air immediately and seek medical attention.

8.10.2. Emergency Spills Requiring External Support

- Defined as greater than 1 liter of non-highly toxic or reactive material, involves a highly toxic or reactive compound, presents an immediate fire or environmental hazard, requires additional PPE, and/or requires specialized training to properly clean up.
- The following procedures shall be followed in the event of an emergency chemical spill:
 - Cease all activities and immediately evacuate the affected area (make sure that all personnel in the area are aware of the spill and evacuate).
 - If chemical exposure to skin or eyes has occurred, the affected personnel should be taken to the nearest safety shower and eyewash station to flush skin or eyes for 15 minutes.
 - If inhalation hazard, get to fresh air immediately and seek medical attention.
 - Dial 911 from a campus phone or 631-5555 from a cell phone. This will initiate a Notre Dame Security & Police and Notre Dame Fire Department response.
 - Clean-up shall be performed by properly trained emergency response personnel using appropriate PPE (e.g., respirator, chemically resistant suit).
 - Spill cleanup supplies, such as absorbents and gloves, contaminated with hazardous waste spills shall be managed as hazardous waste.

9. WASTE MINIMIZATION

9.1. Source Reduction and Reuse: The most desirable method of waste minimization is source reduction to reduce the impact of chemical wastes on the environment.

9.2. Recycling: Used oil, batteries, mercury, fluorescent light bulbs, rechargeable batteries, electronic ballasts, RCRA deregulated metals, and electronic wastes shall be managed for off-site recycling by RMS and/or ND Recycling.



10. PREVENTING UNKNOWN CHEMICALS

- 10.1. Label all chemical containers, including beakers, flasks, vials, and test tubes.
- 10.2. Immediately replace deteriorated or missing labels.
- 10.3. Label containers using chemical names. Do not use abbreviations, structures, or formulae.
- 10.4. Research samples are often stored in boxes containing many small vials or containers. Label the outside of the box with the chemical constituents paying special attention to regulated materials such as radioactives, organic solvents, heavy metals and other toxics. If the samples are nonhazardous, label them as such.

11. TRAINING

- 11.1. All personnel generating or handling hazardous waste shall be trained on the Hazardous Waste Procedure prior to generating or handling hazardous waste and then as needed or as deficiencies are found.
- 11.2. Training on the Hazardous Waste Procedure for operations personnel is located within the Hazardous Waste Training course in ComplyND.
- 11.3. Training on the Hazardous Waste Procedure for laboratory personnel is located within the General Lab Safety training course in ComplyND.

12. FREQUENCY OF REVIEW

- 12.1. This procedure shall be reviewed annually and updated as needed to meet applicable regulatory changes. Field audits will be conducted at least annually.

13. REFERENCES

- 13.1. US EPA. "Resource Conservation and Recovery Act (RCRA) Laws and Regulations." *US Environmental Protection Agency*. US Environmental Protection Agency, 8 Feb. 2016. Web. 6 June 2016. <<https://www.epa.gov/rcra>>
- 13.2. IDEM. "Hazardous Waste." *Land Quality in Indiana: Hazardous Waste*. Indiana Department of Environmental Management, n.d. Web. 06 June 2016. <<https://www.in.gov/idem/waste/hazardous-waste/>>



Revision History Table

History	Effective Date
<ul style="list-style-type: none"> -Updated Appendix C to remove paper Chemical Discard Tags and to add the online Chemical Discard Tag forms information -Changed Appendix B and Appendix D font to match the rest of document -Corrected some issues with footer sections and page numbers -Moved definitions from Appendix A to Section 3 -Added procedure number 	<p>April 2018</p>
<ul style="list-style-type: none"> -Updated Appendix C to include only information on the electronic waste discard tag -5.3.1 Added “The hazards of the wastes shall be identified on the label.” 	<p>April 2019</p>
<ul style="list-style-type: none"> -No changes. 	<p>July 2020</p>
<ul style="list-style-type: none"> -Adjusted margins and spacing. -Added Aerosol cans are handled as Universal Waste at Notre Dame to 3.4 -Added aerosol cans to 3.20. -Removed from 8 Aerosol Cans Waste Aerosol cans shall be managed as hazardous waste. Aerosol cans shall not be punctured. Place aerosol cans in a structurally sound waste container provided by RMS. Keep the lid closed. The container shall be labeled as “Aerosol Can Hazardous Waste”. -Added to 7.1 Waste pick-ups are scheduled on an as needed basis. -Added to 7.3 “Special waste pickups shall be requested through email” 	<p>November 2021</p>

APPENDIX A
PROPERLY DEFACED CHEMICAL BOTTLE LABELS



Deface chemical and
hazard communication
information.



**APPENDIX B
BASIC CHEMICAL SEGREGATION**

Class of Chemicals	Examples	Incompatibilities
Oxidizers	Inorganic oxidizers - Sodium hypochlorite, ammonium nitrate Organic peroxides - methyl ethyl ketone peroxide, allyl compounds, haloalkenes, dienes, monomeric vinyl compounds, vinyl acetylenes, unsaturated cyclic hydrocarbons	Separate from reducing agents, flammables and combustibles
Flammable Liquids	Acetone, benzene, diethyl ether, methanol, ethanol, toluene	Separate from acids, bases, oxidizers, and poisons.
Flammable Solids	Phosphorus, lithium, sodium, potassium	Separate from acids and oxidizers.
Corrosives Acids	Oxidizing acids - nitric acid, perchloric acid, chromic acid, picric acid, chromerge Flammable and organic acids - glacial acetic acid, trifluoroacetic acid, trichloroacetic acid, triflic acid Mineral acids - Hydrochloric acid, sulfuric acid,	Separate from flammable liquids, flammable solids, bases, oxidizers.
Corrosives Bases	Inorganic bases -sodium hydroxide, potassium hydroxide, ammonium hydroxide Reducing agents - Lithium aluminum hydride, sodium borohydride, lithium borohydride	Separate from oxidizers and acids.
Compressed Gases- Oxidizing	Oxygen, chlorine	Separate from flammable gases.
Compressed Gases- Flammable	Methane, acetylene, propane	Separate from oxidizing and toxic compressed gases, oxidizers.
Compressed Gases- Poisonous	Carbon monoxide, hydrogen sulfide	Flammable and/or oxidizing gases.
Compressed Gases - Inert	Nitrogen, helium, argon	See SDS
General Chemicals (Non-reactive)	Agar, sodium chloride, sodium bicarbonate, and most non- reactive salts	See SDS
Water Reactive Chemicals	Sodium metal, potassium metal, lithium metal, lithium aluminum hydride	Separate from all aqueous solutions and oxidizers.
Poisons (Toxicological Hazard)	Cyanides, heavy metals compounds (e.g., cadmium, mercury, osmium) methyl iodide, dimethyl sulfate, mercury	Flammable liquids, acids, bases, and oxidizers.



APPENDIX C
PROPERLY COMPLETED CHEMICAL DISCARD TAG FORMS

1. Chemical Discard Tag forms are available online at the RMS Hazardous Waste website (<https://riskmanagement.nd.edu/environmental-programs/hazardous-waste/>).
2. The Chemical Discard Tag forms need to be submitted to be valid. There are mandatory fields indicated by a red asterisk. These must be completed in order to submit the form.
3. Once submitted, the submitter will receive a confirmation email containing a link to access the completed Chemical Discard Tag form.
4. The completed Chemical Discard Tag form shall be printed and securely affixed to the respective waste container in a manner that allows all information to be fully visible.
5. If the Chemical Discard Tag form wraps completely around the container and itself, covering pertinent information, the container can be placed into a sealed bag with the discard tag affixed to the bag.
6. An example of a properly filled-out discard tag is below. Include the following information on the tag:
 - Chemical Description:
 - All known constituents of the waste shall be listed and spelled out. Do not use acronyms, abbreviations, or formulas.
 - The chemical constituents shall total 100%. Trace constituents (less than or equal to 1%) can be listed as 1%.
 - The following is an example of an acceptable chemical description: "acetone 55%, tetrahydrofuran 10%, chloroform 20%, acetic acid 10%, water <4%, silver nitrate 1%".
 - When submitting unused or expired trade products in original containers, use the product name listed on the factory label or request a safety data sheet (SDS) from the manufacturer to obtain required information for the Chemical Discard Tag form.
 - A SDS is not required to be submitted along with the Chemical Discard Tag for RMS to remove the waste containers.
 - Quantity:
 - The total amount of waste in the container shall be entered in this field, using gram units for solids and liter units for liquids.
 - If the waste is unbroken bulbs or thermometers containing mercury, write the number of bulbs or thermometers in the "quantity".
 - Signature:
 - Click on the acknowledgement checkbox to check the box.
 - The name of the person logging into the Chemical Discard Tag form will auto-populate this section of the form.
 - PI (Principal Investigator):
 - The name of the PI, supervisor, or generator responsible for the waste generated shall be entered in the "PI" field.



This form represents one Chemical Discard Tag.

1. Complete each blank field with the requested information. All fields with asterisks are required to be able to submit the form.
2. When complete, use the "Print" button to print a copy of the form to attach to the waste container.
3. Use the "Submit" button to submit the form, which notifies RMS of your waste pickup need.

Chemical Discard Form

UNIVERSITY OF NOTRE DAME

Facility Information

Control# Department* Building Name* Room Number*

CHEMICALS – Please use ADD button to enter chemicals.

Chemicals *	% of Chemicals(Example:50) *	
<input type="text" value="Acetone"/>	<input type="text" value="50"/>	<input type="button" value="Remove"/>
<input type="text" value="Ethanol"/>	<input type="text" value="50"/>	<input type="button" value="Remove"/>

Please provide complete chemical description in above field. Trade names, abbreviations or chemical formulas are NOT acceptable.
The % of chemicals should be equal to 100 and Chemical names should be entered. Please correct it and resubmit.

Quantity (Vol. in Liters or Wt. in Grams)* Container Type*

Signature Check the box to proceed.
I certify this information is true and that I have done my best to reduce the volume and toxicity of the material.*

Signature* PI First Name* PI Last Name*

Click the "Add" button for each chemical you need to add

Click the "Print" button to print a copy of the Chemical Discard Tag to tape to the waste container.

Click the "Submit" button to submit the completed form.



APPENDIX D NEUTRALIZATIONPROCEDURE

- Review [Personal Protective Equipment \(PPE\) Procedure](#) on the Risk Management and Safety website.
- This process excludes neutralization of the following acids: chromic, perchloric, hydrofluoric, concentrated nitric, trifluoroacetic, and piranha solutions.
- Ensure that the acid or base meets the regulatory code criteria for neutralization (only corrosive code D002).

General Neutralization Instructions:

- Conduct neutralizations in a fume hood as fumes and heat may be generated.
- Wear all appropriate PPE.
- Perform all steps slowly.
- Keep containers cool while neutralizing.

Acid Neutralization:

1. Fill 4 or 8-liter polyethylene bucket with ice water. Process will need nine parts water for each part acid. Make sure container has enough volume to handle the complete reaction.
2. Prepare base solution: saturated solution of sodium carbonate or sodium bicarbonate or 1N NaOH for stronger acids.
3. While stirring, add acid to bucket of ice water.
4. Next stir in base solution.
5. Allow the contents to react for at least four hours to obtain a legitimate pH and to dissipate any heat associated with the neutralization reaction. Solution is neutralized when pH is between 5 and 9.
6. Complete Waste Neutralization Log.
7. Dispose of neutralized solution down the drain with at least 20 parts of water.

Base neutralization:

1. Fill 4 or 8-liter polyethylene bucket with ice water. Process will need 9 parts water for each part base. Make sure container has enough volume to handle the complete reaction.
2. Prepare acid: solid citric acid for weak bases or 1M HCl for stronger bases.
3. Add the base.
4. Slowly add citric acid or 1 M solution HCl
5. Allow the contents to react for at least four hours to obtain a legitimate pH and to dissipate any heat associated with the neutralization reaction. Solution is neutralized when pH is between 5 and 9.
6. Complete Waste Neutralization Log.
7. Dispose of neutralized solution down the drain with at least 20 parts of water.

APPENDIX E
ACCECTABLE LIQUID CHROMATOGRAPHY WASTE COLLECTION OPTIONS AVAILABLE

Safety Cans	Ported (no threads) Cap	4 Port (threaded) Cap	Solvent Bottle Cap
			

Examples of Liquid Chromatography Waste Collection with Properly Modified Caps

Exhaust Filtered	2 Line Carboy	2 Line Glass 4 L	Exhaust Filtered
			