

Hazardous Waste Management Plan

Written By: Carol Pavlick,
EH&S Program Manager
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1.0 PURPOSE

Bucknell University is committed to operating its campus in the safest manner possible, with concern for the individual and the protection of the environment in accordance with all applicable Federal and State statutes. The Hazardous Waste Management Plan, as outlined in the following sections, has been prepared to comply with applicable regulations promulgated by the United States Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PA DEP). This program establishes the requirements that faculty and staff must meet in order to properly manage hazardous waste generated at Bucknell University. Each individual laboratory, classroom, and chemical use space shall make every effort to comply with this program. Additionally, Bucknell will make every effort to reduce the quantity and/or toxicity of the hazardous waste it generates through chemical reuse, material substitution, modified process practices, or other pollution prevention activities where possible.

2.0 AUTHORITY

Title 25 of the Pennsylvania Code, Parts 260a through 270a

Title 40 of the Code of Federal Regulations, Parts 260 through 270

3.0 GENERAL INFORMATION

Simply defined, a hazardous waste is an unwanted material whose properties make it dangerous or capable of harming humans and/or the environment if it is not properly managed. Specifically defined, a hazardous waste is an unwanted material which is either listed by the EPA as a hazardous waste or one or more of its characteristics exceeds any of the four EPA defined thresholds. The four thresholds are flammability, corrosivity, toxicity, and reactivity.

The University has registered with the EPA as a Large Quantity Generator (LQG) of hazardous waste and has been assigned a unique identification number. Bucknell's EPA identification number is PAD003030335.

The process of managing hazardous waste can be broken down into 5 general procedures.

1. The identification of hazardous wastes (HWDC)
2. The collection of hazardous wastes
3. The management of Satellite Accumulation Areas (SAA)
4. The management of Central Storage Areas (CSA)
5. The transportation of hazardous waste offsite for proper disposal

4.0 IDENTIFICATION OF HAZARDOUS WASTES

4.1 Hazardous Waste Determination and Characterization Form

Federal and state regulations require that each waste stream be examined and documented prior to disposal. Determining whether a waste is classified as a hazardous waste is complicated and requires an extensive understanding of the Environmental Protection Agency's and the Pennsylvania Department of Environmental Protection's regulations. The Bucknell Hazardous Waste Determination and Characterization (HWDC) Form has been

developed to simplify and standardize the determination process. A person who generates a waste which may be hazardous must complete the Hazardous Waste Determination and Characterization Form prior to disposal. The Hazardous Waste Determination and Characterization Form has been designed to indicate whether a waste material must be managed as a hazardous waste or if it may be disposed to the regular trash or sanitary sewer. If the form indicates that a waste material is hazardous waste it must be managed according to the procedures described within this program. A completed HWDC Form provides the University with documentation that it can present to a regulatory inspector demonstrating that the hazardous wastes have been properly managed.

4.1.1 How to Find the Form

The Hazardous Waste Determination and Characterization Form (HWDC) is located on Bucknell's EH&S webpage. Bucknell's EH&S recommends that you bookmark this page to make it easier to locate and use.

4.1.2 How to Use the Form

Refer to the "Protocol for Hazardous Waste Determination and Characteristic" to complete the form. This protocol is also on Bucknell's EH&S webpage.

4.1.3 What Does a Completed Form Mean?

If you answered "Yes" to any of the questions of the HWDC form your waste is a hazardous waste. Do not throw the waste in the regular trash or flush it down the sanitary sewer. You are required to collect and manage that material as a hazardous waste as described in this program.

4.2 Inherently Waste-like Materials

A material becomes a waste in two ways:

- (1) You declare it as a waste ("this is garbage") or
- (2) The chemical is considered inherently waste-like.

Chemical containers which are abandoned, unlabeled, in bad condition (leaking, rusty, crusty, dusty), or in any other way appears to be improperly managed are considered inherently waste-like. Inherently waste-like materials must be disposed. Complete the HWDC Form. Dispose of the material to the regular trash, sanitary sewer, or as a hazardous waste according to the HWDC Form results.

4.3 Unidentified or Unlabeled Chemicals

"Unidentified or Unlabeled Chemicals" are those containers without a label, containers labeled with unknown codes, generic process labels that do not specifically list the chemicals contained, and obviously mislabeled chemicals. Unidentified chemicals present a major problem for both management and disposal. If these materials cannot be identified by the generator they can eventually be removed by a licensed contractor, but only after the materials are identified through a very expensive chemical analysis. When a material has been identified a Hazardous Waste Determination and Characterization Form can be

completed. The waste shall be managed as hazardous waste or discarded as a non-hazardous waste according to the completed form.

4.4 Time Sensitive Chemicals

Peroxide forming chemicals, such as ethers, absorb and react with oxygen to form potentially explosive compounds over time. Exposure to air and light accelerates these explosive formations. Therefore, if your unlabeled liquid has crystals present (or the liquid has become unclear), label the container as “Possible Peroxide” and handle as little as possible. These chemicals must be brought to the attention of Bucknell’s EH&S department.

Chemicals such as Picric Acid can become unstable if allowed to dehydrate. Due to the potential for friction or shock-sensitive explosions with these chemicals, do not move or attempt to open these bottles if the container appears old, crystallized, or damaged in any way. These chemicals must be brought to the attention of Bucknell’s EH&S.

Alkali metals are air reactive, and must be kept stored under kerosene. If the kerosene has evaporated, exposing these materials to air, dangerous concentrations of hydrogen, or a metal peroxide crust may have built up. These chemicals must be brought to the attention of Bucknell’s EH&S.

4.5 Unwanted Chemicals

Discarded and unwanted chemicals often represent unnecessary waste. The removal of unwanted chemicals and the frequent evaluation of stored chemical containers are required to maintain campus safety. To properly manage chemicals on the Bucknell campus, the laboratory manager shall:

- Conduct a thorough cleanup and properly dispose of all unknown and unwanted chemicals
- Follow storage and labeling practices described in the Bucknell Chemical Hygiene Plan to ensure that unknown chemical containers do not appear in the future.
- Keep chemical stores to a minimum and review the annual inventory for unwanted chemicals that can be given to colleagues or placed into a re-use program
- Share and borrow small amounts of rarely used chemicals with neighboring laboratories, and when it is necessary to purchase a chemical order only the minimum practical quantity

4.6 Laboratory Renovations and Academic Restructuring

Periodically, the use of a particular laboratory at Bucknell University is modified to meet the needs of new faculty members, an expanding department or academic curriculum. Similarly, as emeritus faculty members leave the institution, their research spaces are reallocated to new department members. Invariably, chemicals and equipment are left behind or are no longer needed and must be addressed. Before renovations can commence, it is imperative that the laboratory is thoroughly inspected and excess chemicals and hazardous waste removed from the area. All excess chemicals and hazardous wastes shall be managed according to the requirements of this plan and the laboratory reassigned to the new faculty member in the best possible condition.

4.7 Universal Waste Identification

Universal waste is a specific category of hazardous waste that poses less of a risk to human health and the environment. Universal Wastes include fluorescent lamps, batteries, intact mercury-containing devices, and legacy pesticides. As the name suggests, these types of waste are universally generated, in nearly every type of business or industry. Universal wastes are managed in accordance with the Bucknell Universal Waste Management Plan. The Universal Waste plan can be found on the EH&S website. Please refer to this plan if you generate fluorescent lamps, batteries, intact mercury-containing devices, and legacy pesticides in your space.

4.8 Waste Minimization

Bucknell University strives to reduce the amount of waste generated and lower the toxicity and persistence of wastes generated by its campus. To accomplish this goal hazardous waste generators shall:

- Conduct a thorough laboratory cleanup and properly dispose of all unknown, unwanted and unneeded chemicals
- Keep chemical stores to a minimum and review the annual inventory for unneeded chemicals that can be given to colleagues or placed into a re-use program before they have become useless or expired
- Share and borrow small amounts of rarely used chemicals with neighboring laboratories
- When it is necessary to purchase chemicals, order the minimum practical quantity
- Substitute more hazardous chemicals with non-hazardous or less hazardous chemicals which will accomplish the same results within its processes
- Do not mix non-hazardous wastes with hazardous wastes

All containers must be stored indoors on a firm-working surface in such a way that they will not rupture or leak. Containers shall be stored in a manner such that, in the event of a release, the contents will not enter the sanitary sewer, storm water drains, or directly to the environment.

5.0 COLLECTION OF HAZARDOUS WASTE

Once a hazardous waste has been identified as described in Section 4 it must be managed according to the federal and state requirements. The necessary management procedures are described in the following sections.

5.1 Illegal Treatment and Disposal

With the exception of emergency cleanup-actions and the treatment of hazardous waste is illegal without a proper permit. All hazardous waste is to be collected for proper disposal by a permitted hazardous waste contractor at a permitted hazardous waste Treatment, Storage, and Disposal Facility (TSDF).

5.2 Legal Disposal to the Sanitary Sewer

Hazardous waste cannot be flushed down the sanitary sewer without issuance of a wastewater discharge permit, which Bucknell does not have and will not obtain. Materials determined not to be hazardous after the HWDC Form has been completed may be flushed to the sanitary sewer. But as previously stated all hazardous wastes must be collected and managed for proper disposal.

5.3 Hazardous Waste Container Requirements

All hazardous waste must be accumulated within proper containers. Proper containers must be:

- Compatible with the waste it is storing (plastic is preferred)
- Equipped with a screw top lid
- Kept closed at all times, except when waste is being added
- Maintained in good condition
- Kept separate from working chemicals
- Labeled properly
-

5.4 Container Marking and Labeling Requirements

Every container of hazardous waste stored within an SAA must be labeled with the following information:

- The words “Hazardous Waste”
- List of chemicals contained within the container and approximate percentages (labels or attached clipboards)
- The building name and room number or space identification where the waste was generated

You may obtain blank labels printed on self-adhesive paper from Bucknell’s EH&S. You may create your own labels if it includes all the required information from the previous list. The label should be attached firmly to the container, using tape or glue.

If the container has an existing label that accurately describes the container's contents, the hazardous waste label should not obscure this label. If the container has an old label, illegible label, or has a label that does not describe the contents correctly the hazardous waste label should obscure the old label as completely as possible.

If the container is too small for the hazardous waste label, then use a suitably sized blank self-adhesive label or a tie on a “hang tag”. Often there are multiple numbers of small containers of similar size and content. If these small containers are not individually labeled, they may be placed in a larger container, e.g., a box, and one hazardous waste label may be applied to the larger container.

6.0 SATTELITE ACCUMULATION AREA (SAA)

A Satellite Accumulation Area (SAA) is the collection point for hazardous waste located in the space it is generated. The federal and state regulations clearly state that hazardous waste

generated in one space cannot be taken to another space for collection. This means that every lab, studio, shop, or other space which generates hazardous waste must establish and properly manage a SAA in that space for the collection of its hazardous waste. The specific management requirements for a SAA are discussed within this section.

6.1 SAA Management Requirements

The following sections describe the required SAA management procedures. It has been written to be used as a check list to ensure your SAA complies with the federal and state regulations.

6.1.1 Located at or near the point of generation Hazardous waste must be collected in the space where it is generated. Waste cannot be transported from the space where it is generated to a SAA located in another space. Waste can only be transported from the SAA where it is generated to a Central Storage Area (CSA) by individuals who have taken the Hazardous Waste Transporter Training.

6.1.2 Under the control of the generator Hazardous waste collected within a SAA must also be under the control of its generator. A space which multiple professors perform different experiments or research must have a SAA for each professor. However, a teaching lab where multiple professors teach the same experiments for different classes may have a single SAA. It is extremely important in this case that all containers are labeled properly and the professors work together to ensure the wastes are added to the correct containers.

6.1.3 Containers must be in good condition Hazardous waste containers must be maintained in good condition, containers cannot be damaged, leaking, bulging, heavily rusted, heavily corroded, dented, etc.

6.1.4 Screw-on lid Hazardous waste containers must be equipped with screw top lids, to prevent accidental spills and evaporation of hazardous waste to the air. To comply with the regulations a container may be turned upside down and not leak. This means paraffin wax, glass stoppers, rubber stoppers, tin foil, etc. do not qualify as proper closure devices.

6.1.5 Containers must be compatible with the waste it stores Do not store hazardous waste in a container that it will react with and weaken. For instance, do not store hydrofluoric acid within a glass container or organic solvents within a HDPE container.

6.1.6 Containers must be kept closed All hazardous waste containers must be kept closed at all times except when waste is being added or removed. According to the regulations, open hazardous waste containers may be considered as illegal disposal of a hazardous waste via evaporation.

6.1.7 Do not overfill containers Only fill hazardous waste containers to approximately 90% of its total capacity. The free space allows for expansion and reduces chances of bulging and makes it easier and safer for hazardous waste managers to prepare the waste for transportation to the treatment facilities.

6.1.8 Label containers with the words “Hazardous Waste” Each and every hazardous waste container must be labeled with the words “Hazardous Waste”. Do not abbreviate or manipulate this, the words “hazardous waste” are specifically required.

6.1.9 Label containers with building and room number Each and every hazardous waste container must be labeled with the building and room number where it was generated. This information will aid Bucknell’s EH&S to ensure that the hazardous waste is disposed of properly.

6.1.10 Containers must have their contents identified in writing Each and every hazardous waste containers must be labeled or tagged with its contents. List the constituents of the waste and their approximate proportions. A label can be adhered to the container with tape or glue, or a tag can be tied to the container, or a composite sheet can be attached. This can be done in many ways, as long as the contents of the hazardous waste are appropriately described.

6.1.11 Containers must be in secondary containment Each and every hazardous waste container must be stored in a secondary containment tray or bucket. The secondary containment unit must be capable of containing 10% of the total volume in storage or 100% of the largest hazardous waste container, whichever is greater.

6.1.12 Incompatible wastes must be segregated Incompatible hazardous wastes cannot be stored within the same secondary containment tray because if there were to be a leak a possibly dangerous reaction may result. Ensure incompatible hazardous wastes are stored in separate secondary containment trays.

6.1.13 Separate from working chemicals Hazardous waste containers must be stored separately from the non-waste chemicals. A common example would be when hazardous waste containers are stored within a fume hood alongside other working chemicals. The proper management procedure would be to divide the hood using masking tape. Keep hazardous waste containers to one side and working chemical containers on the other side. This procedure will prevent confusion over which containers are hazardous waste containers and which are not.

6.1.14 Cannot exceed fifty-five (55) gallons of hazardous waste The total amount of hazardous waste stored within a SAA cannot exceed fifty-five (55) gallons. If this limit is exceeded immediately contact Bucknell’s EH&S and the waste will be transferred from the SAA within forty-eight (48) hours.

6.1.15 Cannot exceed 1 quart of acutely hazardous waste Acutely hazardous waste includes all hazardous wastes which have a “P” waste code. The total amount of acutely hazardous waste stored within a SAA cannot exceed one (1) quart. If this limit is exceeded immediately contact Safety Services and the waste will be transferred from the SAA within 48 hours.

7.0 CENTRAL STORAGE AREA (CSA)

A CSA is where hazardous waste from multiple SAAs is collected and prepared for transport from the campus. CSAs have different management requirements than SAAs. Once a hazardous waste container is transferred from a SAA to a CSA it must comply with the CSA requirements.

7.1 CSA Management Requirements

The CSA must be:

- Indoors on an impervious surface
- Provide secondary containment that can contain 10% of the total volume in storage or 100% of the largest container, whichever is greater
- Inspected weekly
- Maintained separate from all other areas and restricted to authorized personnel only
- Posted with “No Smoking” signs and have all potential sources of ignition or reaction removed or addressed before work with ignitable or reactive wastes commences
- Placarded appropriately
- Posted with a list of emergency contact phone numbers
- All waste must be labeled with the words “Hazardous Waste” and the date

7.2 Disposal of Hazardous Wastes

Hazardous wastes must be removed from a large quantity generator (LQG) site within 90 days. Hazardous waste pickups at Bucknell must be conducted by a licensed hazardous waste contractor before the end of each 90-day accumulation period. Decisions regarding the choice of vendor must not be based solely on price, but must take into account the potential long-term liability to the institution. All other hazardous wastes must be transported to a licensed hazardous waste facility for recycling, incineration, or chemical treatment before landfill disposal.

8.0 TRANSPORTATION OF HAZARDOUS WASTE

8.1 Shipping Manifests

Bucknell representatives shall ensure that the EPA-required “Uniform Hazardous Waste Manifest” (EPA Forms 8700–22 and 8700–22A) is completed properly. The Bucknell representative who has received DOT Hazardous Materials training within the past three (3) years shall review and sign the manifest by hand and obtain the handwritten signature of the initial transporter and date of acceptance. Bucknell will retain one copy, and give the HW contractor the remaining copies of the manifest. Bucknell must receive a signed copy of from the TSDF which certifies that the waste has been received. If this signed copy is not received within 45 days, Bucknell must submit an Exception Report as discussed in section 8.2.

A copy of each manifest and accompanying documents must be kept for three (3) years. Once Bucknell receives a signed copy of each manifest from the destination facility which received the waste this copy will also be retained for three (3) years. Documents older than three years are archived separately from the current files.

8.2 Manifest Exception Report

If Bucknell does not receive a signed copy of a hazardous waste manifest from a TSDF within 45 days of shipment, which confirms the arrival of the shipment, then an Exception Report must be submitted to the Pennsylvania DEP and the EPA.

The Exception Report would include a legible copy of the manifest for which the institution does not have confirmation of delivery, and a cover letter signed by the institution's authorized representative explaining the efforts taken to locate the hazardous waste and the results of those efforts. The submission to EPA need only be a handwritten or typed note on the manifest itself or on an attached sheet of paper, stating that the return copy was not received. The institution must keep a copy of each Exception Report for a period of at least three (3) years.

8.3 Hazardous Materials Registration

Bucknell University must submit a complete and accurate registration statement on DOT Form F 5800.2 no later than June 30 for each registration year. Documentation of registration and payment is received in the form of a Hazardous Materials Registration Certificate, which must be retained for three (3) years.

8.4 Hazardous Waste Biennial Reports

As an LQG of hazardous waste in Pennsylvania, Bucknell must prepare and submit a biennial report of shipments of hazardous waste off-site to any treatment, storage or disposal facility. This report must be sent to the PA DEP Bureau of Land Recycling and Waste Management by March 1 of each even numbered year.

The Biennial Report form, EPA Form 8700-13, must cover generator activities during the previous, odd-numbered year, and must include the following information:

- The EPA identification number, name, and address of the generator
- The calendar year covered by the report
- The EPA identification number, name, and address for each off-site TSDF in the United States to which waste was shipped during the year
- The name and EPA identification number of each transporter used during the reporting year for shipments to a TSDF within the United States
- A description, EPA hazardous waste number, DOT hazard class, and quantity of each hazardous waste shipped off-site to a TSDF within the United States. This information must be listed by EPA identification number of each such off-site facility to which waste was shipped. The PA DEP requirements include exported hazardous waste, but do not require hazardous waste sent off-site to be listed by the off-site facilities used or that the off-site facilities be identified
- A description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated
- A description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years
- Certification of the Report signed by the institution's authorized representative

The institution must keep a copy of each Biennial Report for a period of at least three (3) years from the due date of the report.

9.0 RECORDKEEPING AND REPORTING

9.1 Shipping Manifests

See Section 8.1 for a description of Bucknell's hazardous waste manifest procedures. Bucknell's EH&S will maintain all hazardous waste manifests and other related documents for (3) three years. Documents older than three years are archived separately from the current files.

9.2 Waste Determinations

See Section 4.1 for a description of Bucknell's waste determination procedures. Bucknell's EH&S will maintain all waste determinations whether submitted in electronic or hard copy.

9.3 Biennial Report

See Section 8.4 for a description of Bucknell's Biennial Report procedures. Bucknell's EH&S will maintain all Biennial Reports for the last (3) three years.

9.4 Exception Reports

See Section 8.2 for a description of Bucknell's Exception Report procedures. Bucknell's EH&S will maintain all Exception Reports for the last (3) three years.

9.5 Summary of Additional Records

The institution must also keep the following records:

- Hazardous waste manifest training certificates
- DOT hazmat registration certificates
- Bucknell's CSA inspection logs
- Hazardous waste generator training agenda and sign-in sheets
- Hazardous waste transfer training agenda and sign-in sheets
- Spill response training agenda and sign-in sheets

10.0 HAZARDOUS WASTE EMERGENCY

10.1 Emergency Response Equipment and Procedures

Specific emergency response procedures are located in the Bucknell University Hazardous Waste Contingency Plan. The Hazardous Waste Contingency Plan includes these required components:

- Applicability
- Maintenance and operation of facility
- Required equipment
- Testing and maintenance of equipment
- Access to communications or alarm system
- Required aisle space
- Arrangement with local authority

- Copies of the contingency plan
- Amendment of the contingency plan
- Emergency coordinator
- Emergency procedures

11.0 TRAINING

11.1 Hazardous Waste Management Training

Individuals who generate or handle hazardous wastes will be trained in:

- state and federal requirements
- hazardous waste determinations
- SAA management requirements
- containers, compatibility, handling, and storage procedures
- accumulation limits
- container inspections
- emergency procedures
- spill response

Each generator will be assigned this training program on an annual basis. The documentation from training will be retained by Human Resources.

11.2 Hazardous Waste Transporters

Individuals authorized to access and move hazardous waste from a SAA within the chemistry or biology building to the chemistry CSA will be trained in:

- state and federal requirements
- CSA management requirements
- containers, compatibility, handling and storage procedures
- labeling requirements
- accumulation limits
- spill response procedures
- emergency response actions
- container inspections
- emergency procedures
- spill response

Each transporter will be assigned this training program on an annual basis. The documentation from training will be retained by Human Resources.

11.3 Hazardous Waste Manifest Training

There shall be at least two employees of Bucknell University who receive DOT Hazardous Materials Training, in addition to hazardous waste training, to ensure that hazardous waste manifests are completed properly. Only those individuals who have been trained are to sign hazardous waste manifests on behalf of the institution. This training must be re-taken every three (3) years