Biohazardous Waste Disposal Plan

February 2015
# Table of Contents

Section 1: Introduction .................................................................................................................. 3

Section 2: Definitions ...................................................................................................................... 3
  Biohazardous Waste .................................................................................................................. 3
  Infectious Waste ....................................................................................................................... 3
  Regulated Medical Waste ......................................................................................................... 3
  Category A Infectious Substance ............................................................................................ 4
  Clinical Waste ........................................................................................................................ 4
  Biomedical Waste ................................................................................................................... 4
  Pathology Waste ...................................................................................................................... 4
  Solid Waste ............................................................................................................................. 4
  Liquid Waste .......................................................................................................................... 4
  Sharps Waste .......................................................................................................................... 4
  Red Bag Waste ....................................................................................................................... 4
  Regular Trash ......................................................................................................................... 4

Section 3: Roles and Responsibilities ........................................................................................... 4
  Principal Investigator (PI) ........................................................................................................ 4
  Office of Environmental Health and Safety (OEHS) ............................................................. 4
  Facilities .................................................................................................................................. 5
  Generator ................................................................................................................................. 5

Section 4: Waste Handling and Management ............................................................................... 5
  Collection, Segregation and Storage ....................................................................................... 5
  Packaging ................................................................................................................................. 6
  Signs and Labeling ................................................................................................................ 7
  Transport .................................................................................................................................. 7
  Personal Protective Equipment ............................................................................................... 7
  Training .................................................................................................................................... 7

Section 5: Decontamination of Waste ........................................................................................ 7
  On-site treatment .................................................................................................................... 7

Section 6: Autoclave Procedures ................................................................................................ 8
  Validation .................................................................................................................................. 8
  Waste Processing ................................................................................................................... 8
  Maintenance ............................................................................................................................. 9
  Quality Testing ....................................................................................................................... 9
  Error Messages or Maintenance Issues .................................................................................. 9

Section 7: Recordkeeping ............................................................................................................. 10

Appendix A: Biological Waste Flowchart .................................................................................. 11

Appendix B: Validating Autoclaves .......................................................................................... 12

Appendix C: Sample Waste Log ................................................................................................. 13

Appendix D: Liquid Waste Collection Set-up ............................................................................. 14
Section 1: Introduction

This plan outlines the requirements for disposal of biohazardous waste for the University of New Hampshire campuses, including Durham, Manchester, and Jackson Estuarine Laboratory. The biohazardous waste plan encompasses all wastes of biological origin, including wastes defined by various regulatory agencies as infectious waste, regulated medical waste, biomedical waste, clinical waste, sharps waste and pathological waste.

Section 2: Definitions

Biohazardous Waste

The general term biohazardous waste in this plan encompasses infectious waste, regulated medical, biomedical, clinical, pathology and sharps waste.

Infectious Waste

The New Hampshire Department of Environmental Services (NH DES) defines Infectious Waste as:

1. Cultures and stocks of infectious agents and associated biologicals, including:
   a. Cultures and stocks of infectious agents from research and industrial laboratories;
   b. Wastes from the production of biologicals, discarded live and attenuated vaccines; and
   c. Culture dishes and devices used to transfer, inoculate and mix cultures;
2. Pathological wastes, including tissues, organs, and body parts that were removed during surgery or autopsy;
3. Waste human blood and products of blood, including:
   a. Serum, plasma and other blood components;
   b. Containers contaminated with a. above which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals; and
   c. Items saturated or dripping with human blood or items that were saturated or dripping with human blood that are now caked with dried human blood or blood components;
4. Sharps that have been used in human or animal patient care or in medical, research or industrial laboratories, including hypodermic needles, syringes, Pasteur pipettes, broken glass and scalpel blades;
5. Contaminated animal carcasses, body parts, and bedding of animals that were exposed to infectious agents during research, production of biologicals, or testing of pharmaceuticals;
6. Wastes from human or animal patient care, surgery or autopsy that were in contact with infectious agents, including soiled dressings, sponges, drapes, lavage tubes, drainage sets, under pads, and surgical gloves;
7. Laboratory wastes from medical, pathological, pharmaceutical, or other research, commercial or industrial laboratories that were in contact with infectious agents, including slides and cover slips, disposable gloves, laboratory coats, and aprons;
8. Dialysis wastes that were in contact with the blood of patients undergoing hemodialysis, including contaminated disposable equipment and supplies such as tubing, filters, disposable sheets, towels, gloves, aprons, and laboratory coats;
9. Discarded medical equipment and parts that were in contact with infectious agents;
10. Biological waste and discarded materials contaminated with blood, excretion, exudates or secretion from humans or animals that are isolated to protect others from communicable diseases;
11. Any discarded preparations made from genetically altered living organisms and their products; and
12. Such other waste material that results from the administration of medical care to a patient whether human or animal by a health care provider and is found by the director in consultation with the division of public health services or state veterinarian to pose a threat to human health or the environment due to its infectious nature.

Regulated Medical Waste

The U. S. Department of Transportation (DOT) defines Regulated Medical Waste as a waste or reusable material derived from the medical treatment of an animal or human, which includes diagnosis and immunization, or from biomedical research, which includes the production and testing of biological products. Regulated medical waste containing a Category A infectious substance must be classed as an infectious substance.
**Category A Infectious Substance**
The U. S. DOT defines a Category A Infectious Substance as an infectious substance in a form capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs. An exposure occurs when an infectious substance is released outside of its protective packaging, resulting in physical contact with humans or animals.

**Clinical Waste**
The U. S. DOT defines clinical waste the same as Regulated Medical Waste (definition above). Clinical waste containing a Category A infectious substance must be classed as an infectious substance.

**Biomedical Waste**
The U. S. DOT defines biomedical waste the same as Regulated Medical Waste (definition above). Biomedical waste containing a Category A infectious substance must be classed as an infectious substance.

**Pathology Waste**
Contaminated animal carcass waste and anatomical waste, including organs, limbs and tissues of human or animal origin that were exposed to infectious agents during research, production of biologicals, or testing of pharmaceuticals.

**Solid Waste**
Non-glass solid or semi-solid lab waste material such as gloves, plastic, paper, agar, etc.

**Liquid Waste**
Cultures, blood, bodily fluids, cell culture media or other liquid media, buffers, etc.

**Sharps Waste**
Needles, syringes, capillary tubes, microscope slides and cover slips, glass cuvettes, scalpels, razor blades, and any broken glassware that is contaminated with biological material.

**Red Bag Waste**
Solid biohazardous waste that is collected in regulated biomedical waste “burn” boxes, which is sent out with a contracted biomedical waste disposal service.

**Regular Trash**
Waste that has not been contaminated with biohazardous materials, or has been properly decontaminated using regulatory approved methods such as steam sterilization or chemical inactivation.

**Section 3: Roles and Responsibilities**

**Principal Investigator (PI)**
The PI must ensure that all generators of biohazardous wastes in their lab are trained to prepare and dispose of these wastes according to this policy.

**Office of Environmental Health and Safety (OEHS)**
OEHS is responsible for the transport of biohazardous waste between buildings, for providing biohazardous waste generator training, and for biennial audits of the biohazardous waste policy. The Biological Safety/Security Officer within the Office of Environmental Health and Safety is responsible for the collection of the biohazardous waste disposal logs and autoclave quality assurance testing documentation.
**Facilities**

Facilities personnel are responsible for routine maintenance, troubleshooting, and repair of autoclave units that are part of the built in equipment of Rudman Hall, Kendall Hall and Gregg Hall.

**Generator**

Any person that generates biohazardous wastes must adhere to the methods outlined in this policy.

**Section 4: Waste Handling and Management**

**Collection, Segregation and Storage**

**General Guidelines**

1. Biohazardous waste is collected in its own leak-proof container and is segregated from other types of waste. Waste is collected in a container of sufficient structural integrity to protect against spillage or accidental release to the environment during collection and storage. Containers must be impervious to moisture.
2. Waste is stored in the laboratory generating the biohazardous waste. Access to waste storage is limited to authorized people only. Waste must be secured to prevent unauthorized access.
3. All waste is protected from the elements and will be maintained in a nonputrescent state, using refrigeration and freezing, if necessary.
4. Biohazardous waste is not to be stored at room temperature for longer than 72 hours.
5. Biohazardous waste storage area must be free of animals and pests, such as insects, rodents or other potential vectors.

**Solid Waste**

1. Solid waste destined for off-site disposal as red bag waste can be collected directly in the red bags lining a biobox. If a satellite container is used, the container must have the universal biohazard symbol displayed on the outside of the container. Collection bags can be red or orange in color and must also have the biohazard symbol.
2. Solid waste that is destined to be treated on-site via the autoclave must be collected in an appropriately sized clear autoclave bag. See the packaging section for details about autoclave bags. Autoclave bags must be held within a rigid container that has the universal biohazard symbol displayed on it. If a clear autoclave bag is full and is removed from its container and stored prior to disinfection, the biohazard symbol must be affixed to the bag using a label, sign or tag during storage.
3. Biohazardous waste that can puncture or cut the red bag or autoclave bag, but are not defined as sharps, must be placed in a smaller, sturdy container prior to being placed in the bag. Examples are pipet tips and serological pipets.
   i) If destined for red bag waste, these items must be placed in a cardboard or paperboard container or a plastic sleeve prior to placing into the red bag.
   ii) If destined for autoclave treatment, this waste must be double bagged prior to placing in the autoclave bag to prevent cutting through the bag.
4. All biohazardous waste collection containers must be covered, unless waste is actively being added to it.

**Liquid Waste**

1. Liquid waste is collected in a container compatible with the waste being collected. The universal biohazard symbol must be affixed to the collection container.
2. Collection containers must be placed in secondary containment to catch any spills that may occur during liquid waste collection.
3. If using the house vacuum system or a vacuum pump, an in-line HEPA filter must be used prior to the pump. See appendix D for a diagram of a proper liquid waste set-up.

**Sharps Waste**

1. Sharps waste is collected in a rigid, puncture resistant container.
2. Sharps containers are filled to ¾ full and sealed.
3. Sealed sharps containers can be placed in red bag lined bioboxes, or contact the Hazardous Waste Coordinator for pickup.
Pathological Waste
Pathological waste may be accumulated in double lined biohazard “burn” boxes, or double lined 55 gallon open head polydrums. Contact OEHS for accumulation specifics and pickup schedules for your area.

Mixed Waste
Any waste that contains biological materials along with either chemicals, or radioactive materials, or both, is considered mixed waste. Collect this waste separately from biohazardous waste and contact the Office of Environmental Health and Safety for disposal.

Packaging
Red bags
Red bags used to line the biohazard “burn” boxes are provided by OEHS. Satellite containers used to collect small amounts of red bag waste prior to placing the waste in a “burn” box can use either red or orange bags labeled with the biohazard symbol. Bags such as Fisher #01-830A, or VWR # 14220-106 are acceptable.

When a satellite biohazard bag is full, seal the bag with lab tape and place the sealed bag into the double-lined “burn” box.

Bioboxes
Biohazard “burn” boxes are available from OEHS. Boxes must be double lined with the red bags provided by OEHS.

Preparing boxes for use:
1. Ensure the box is set up facing the correct direction. The arrows printed on the box should be facing upwards.
2. Fold in the box flaps; smaller sides first, then the larger flaps. Do not overlap the flaps.
3. Tape the bottom flaps with heavy duty packing tape along the seam.
4. Line the box with two interior red bags. The red bags must have the biohazard symbol.

Preparing boxes for pick-up by OEHS:
1. While using proper personal protective equipment, seal the innermost red bag with lab tape, a zip tie or tie in a knot.
2. Close the second interior liner bag with lab tape, a zip tie or tie in a knot.
3. Close the two smaller box flaps on top of the box, followed by the larger flaps and seal with two rows of packaging tape along the seam.
4. Write the name of the building and room number where the biological waste was accumulated on top of the box.

Bioboxes are sent for disposal through a biomedical waste vendor and must comply with the vendor’s policies otherwise boxes will be refused during pickup and must be repacked. Bioboxes will be refused for pick-up if they:

1. Exceed 50lbs;
2. Contain chemical or radioactive materials;
3. Contain free liquid that would cause leaky boxes
4. Contain sharps, unless they are sealed within a hard-walled sharps container within the box
5. Have been packaged upside with the arrows and writing facing the wrong direction; and
6. If the flaps are overlapped or interlocked.

Boxes that are refused will be left in the lab generating the waste for re-packaging.

Autoclave Bags
Bags used for autoclaving biohazardous waste on the UNH campus must be clear and have no biohazard symbols or warnings printed on the bags. Once treated and compliant with NH regulatory standards, this waste is destined for the municipal waste stream, and therefore the bags cannot have permanent biohazard markings. Bags such as VWR #14220-042, or Fisher #01-826-6 are acceptable.
See section 5 for specifics on the process of autoclaving waste. Once autoclaved, the waste is placed in a 1mil thick black garbage bag prior to being thrown into a designated dumpster.

Sharps Containers
Sharps containers come in many different shapes and sizes. Many types of containers can be used and the generator of the waste can choose which is most appropriate based on the application for which it is being used. Clinical labs and research labs may have different types of sharps being collected and therefore may use different styles of containers. Sharps containers must be hard-walled, polypropylene plastic, red in color, and sealable. The containers must have the universal biohazard symbol printed on them. An example of acceptable sharps containers are VWR #19001-001, or #19001-010, or Fisher #22-037-970, or #14-827-104.

Signs and Labeling
Waste collection and storage areas must be signed with the universal biohazard symbol.

All waste containers must be marked with the universal biohazard symbol.

Clear waste bags that are waiting to be autoclaved must be labeled with the universal biohazard symbol. This can be done using tags provided by OEHS, tags made by the generating lab, or using removable labels. If a tag is used, the tag must be removed prior to placing the bag in the autoclave to prevent melting. All symbols MUST be removed after sterilization in the autoclave and prior to placing the bag in the dumpster.

Transport
Transport of biohazardous waste between labs or through lab hallways must be in secondary containment and on a cart. If biohazardous material is in a clear autoclave bag en-route to the autoclave for treatment, it must be labeled with the universal biohazard symbol. The bag can be tagged or labeled with the biohazard symbol as described above, or the secondary container can be labeled with the biohazard symbol.

Transport of biohazardous waste between buildings by personnel other than OEHS is prohibited. Contact the Hazardous Waste Coordinator at 863-3526 for transport of biohazardous waste between buildings.

Personal Protective Equipment
When preparing and handling biohazardous waste, personnel must don lab coats, disposable gloves and safety glasses.

When removing disinfected waste from the autoclave, personnel should use autoclave gloves, lab coats and safety glasses. Steam released from the autoclave after a cycle has completed is very hot and may contain residual smells or fumes. It is best to stand away from the autoclave door when opening and allow the ventilation system to draw the steam away from the operator.

Training
Personnel generating biohazardous waste are expected to complete biological safety training for the appropriate containment level of their laboratory, either BSL-1 or BSL-2 training. In addition, if personnel autoclave biohazardous waste, the “Autoclaving Biohazardous Waste” training must be completed. The Biological Safety/Security Officer is available to deliver customized biosafety training for any lab that requests it.

Section 5: Decontamination of Waste
Biohazardous waste may be treated on-site in order to achieve disinfection by regulatory acceptable practices. Once properly decontaminated, this waste becomes regular trash and may be placed in designated dumpsters. Proper paperwork must be kept in order to dispose of disinfected waste in the municipal waste stream.

On-site treatment
At UNH, steam sterilization and chemical inactivation are the acceptable treatment practices for biohazardous waste.
1. Steam sterilization is achieved by successfully completing three parameters in a validated UNH autoclave. Proper time, temperature and pressure must be achieved in order to properly treat biohazardous waste. The minimum parameters for treating biohazardous waste are 121°C, 15 psi, for 60 minutes in a validated autoclave. To minimize the time requirement, the operator must prove that the center of the waste load reached temperature and pressure for a minimum of 20 minutes by validating waste runs with commercial spore tests. See Section 6 for more autoclave details.

2. Chemical inactivation of liquid waste is achieved using an EPA approved disinfectant. Approved disinfectants can be found at [http://www.epa.gov/oppad001/chemregindex.htm](http://www.epa.gov/oppad001/chemregindex.htm).
   a. Sodium hypochlorite (bleach) is the most common liquid disinfectant used for disinfection of biohazardous waste, such as cell culture media. A final concentration of 10% of typical household bleach is required to properly disinfect liquid waste. (Household bleach is 5.25% w/v sodium hypochlorite). If waste has a high organic load, a final concentration of 20% bleach is recommended. Once bleach is added to the liquid waste, the solution should be mixed well and allowed to sit for 30 minutes. The disinfected solution can then be drain disposed in a lab sink if no other hazards are present.
   b. If a liquid waste is a mixed waste, such as biological and radiological, or biological and chemical, contact EHS prior to treatment to ensure the disinfectant is compatible with all components of the waste.

**Section 6: Autoclave Procedures**

**Validation**

Any autoclave used to treat biohazardous waste must go through a validation process prior to being used for waste. The validation process consists of three back-to-back waste runs of a maximum load capacity, with spore tests placed in the center of each waste load. Placing a spore ampoule under the center of each bag simulates placement at the center of each bag of waste where steam penetration may be at its weakest. Using this method for validation reduces the operator’s risk of exposure to waste materials.

Commercially manufactured spore suspensions of *Geobacillus stearothermophilus* are required for spore testing. Spore tests are available through a variety of manufacturers and suppliers, such as ATS ([http://atssupplies.com](http://atssupplies.com)); Sterikon ([http://www.emdmillipore.com](http://www.emdmillipore.com)); and Raven Biological Labs ([http://www.mesalabs.com/biological-indicators/](http://www.mesalabs.com/biological-indicators/)).

UNH autoclaves that have been validated to process biohazardous waste are listed in appendix B. Contact the Biological Safety Officer to develop an autoclave validation plan for additional autoclaves.

**Waste Processing**

Lab workers who process biohazardous waste through a steam autoclave are required to take the OEHS training on Blackboard called "Autoclaving Biohazardous Waste". The training walks an operator through each of the steps required to process and document biohazardous waste treatment.

1. Solid Waste must be contained in a clear autoclave bag with no biohazard symbol. The maximum size for autoclave bags is 24" x 30". **If larger bags are used, contact EHS to validate sterilization times for larger bags.**
   a. The bag must be loosely sealed with autoclave tape or laboratory tape. A loose seal allows steam to exit during waste treatment.
2. Liquid waste must be contained in a polypropylene, glass or other heat stable container. Leave the material uncovered, or loosely cover the container. A loose seal allows steam to exit during waste treatment.
3. An autoclave pan must be used in every waste run, for both solid and liquid waste, to catch media and agar that may leak from the container/bag. Stainless steel autoclave pans are recommended because they distribute heat more evenly than polypropylene; therefore, allowing better decontamination.
4. A chemical indicator strip is included in every waste run to ensure proper temperature and pressure has been achieved. Chemical indicators must be saved and secured to the waste log as a reference of autoclave run completion. Section 7 details proper recordkeeping procedures.
5. Waste processed in the Getinge 533LS autoclaves are run on cycle “P08” for 121°C, 15 psi for 60 minutes.
For all other autoclaves, contact the Biological Safety Officer to set up a validation schedule and proper
time parameters for the autoclave.

6. Waste bags that have been disinfected properly must be allowed to cool. Once the bag is cool and any
melted agar has congealed, the bag must be placed in a 1 mil thick, black garbage bag and brought to the
designated dumpster. The Rudman Hall dumpster is locked; obtain the key code from your supervisor or
lab manager. For ease of use and ergonomic considerations, do not exceed 25lbs in the black bags and
transport the bags to the dumpster on a cart. When lifting the bag into the dumpster, use both hands and lift
the bag from the top shelf of the cart into the dumpster.

Maintenance

1. Daily maintenance is required to keep the autoclaves in good working order.
   a. Inspect the door seal gasket daily for signs of wear. Check for full retraction of the gasket into the
door seal chamber. Contact facilities if the gasket is compromised in any way.
   b. Clean the chamber daily to remove spillage and staining and to prevent damage to the surfaces.
      To clean, remove the shelves and use a mild cleaning solution. Rinse thoroughly after cleaning.

2. Weekly maintenance helps to maintain the safety integrity of automatic door units. Test the safety stop of
automatic door units weekly by applying light pressure to the leading edge of the door during its closing
motion. If the door does not stop when pressure is applied, contact Facilities.

3. Quarterly maintenance prolongs the life of the autoclave unit. Facilities’ personnel are responsible for
quarterly maintenance.
   a. Remove the door seal gaskets and make complete inspection for replacement or reseating.
   b. Remove and clean the strainers located just past the supply inlet connections and on the outlet of
      the jacket. This is located just upstream of the jacket steam trap.
   c. For units with automatic doors, check the pneumatic doors and valves for correct oil level in the
      air lubricator.
   d. Check the pressure of the incoming steam, water and air. Adjust the valves to correct any pressure
difference, positive or negative, to agree with the manufacturer’s piping schematic.
   e. Inspect all pipes, valves and connections visually for evidence of leakage and corrosion.
   f. Lubricate door guides with high temperature grease.

4. Annual calibration and inspection of all probes is required. Facilities’ personnel are responsible for
replacing any probes that are not functioning properly, or cannot be calibrated to manufacturer’s
specifications.

5. As needed, OEHS will check, collect and replace the printer paper on autoclaves with functioning printers.

Quality Testing

All autoclaves that are validated for biohazardous waste treatment are spore tested regularly. Testing frequency is
determined by how often waste is processed. The frequency of spore testing in validated autoclaves is as follows:

1. Rudman Hall G61-1 – weekly spore testing
2. Rudman Hall 229 – weekly spore testing
3. Rudman Hall 263-1 – weekly spore testing
4. Rudman Hall 263-2 – weekly spore testing
5. Kendall Hall 302 – monthly spore testing
6. Jackson Estuarine Laboratory – quarterly spore testing
7. Gregg Hall 347G – quarterly spore testing

If an autoclave is serviced or if there is a disruption of steam, it is best to quality test the autoclave with a spore
ampoule before resuming normal biohazardous waste treatment.

Contact the Biological Safety Officer if additional autoclaves need to be validated and quality tested for
biohazardous waste processing purposes.

Error Messages or Maintenance Issues

If an autoclave operator encounters an error message or autoclave problem, the operator must contact their lab
supervisor, department lab coordinator, or Facilities. All autoclave issues must be entered into Facilities’ FAMIS
system (https://famis.unh.edu/famisxi_prod/selfservice/Login) to be scheduled for repair, maintenance, or troubleshooting.

**Section 7: Recordkeeping**

All waste runs and spore tests must be documented in order to be in compliance with New Hampshire regulation and UNH Waste Management contracts.

**Waste Logs**
Appendix C details the minimum information required to be kept for every waste run in a validated autoclave.

Operators must complete each section of the waste log completely and attach the chemical indicator strip in the notes section.

A chemical indicator is required for every run unless a spore test is run. Indicate that a spore test was run in the notes section, if applicable.

OEHS will collect waste logs monthly and replenish binders/clipboards with new waste logs.

**Spore Test Logs**
Spore tests are documented in UNH CEMS. Operators will indicate the following for all spore tests run:
- Operator Name
- Autoclave Name/Location
- Testing Date
- Cycle parameters
- Spore Manufacturer
- Ampoule Lot Number
- Ampoule Expiration Date
- Test Results
- Additional notes as necessary

If a spore test fails, operators should detail what the next steps are in the notes section. (example: “rerun quality testing at 75 minutes”)

Autoclave operators may keep their own record books for spore testing, but must enter results directly into UNH CEMS, or send results to the Biological Safety/Security Officer for entry into CEMS, on an annual basis at a minimum.
Appendix A: Biological Waste Flowchart

BIOLOGICAL WASTE STREAMS

SOLIDS
- Plates
- Tubes
- Gloves
- Contaminated Paper
- Serological Pipettes
- Pipette Tips

CONTAMINATED SHARPS
- Razors
- Needles/Syringes
- All glass products

CLEAN GLASS
- Cuvettes
- Tubes
- Slides
- Pasteur Pipettes
- Glass that has been chemically disinfected can go in the blue and white glass boxes.

NO CHEMICALS OR RADIOLOGICALS ALLOWED IN ANY BIOLOGICAL WASTE STREAM!!!!
Appendix B: Validating Autoclaves

Autoclaves that are currently validated for solid biohazardous waste processing are:

- Rudman Hall G61-1
- Rudman Hall 229
- Rudman Hall 263-1
- Rudman Hall 263-2
- Kendall Hall 302
- Jackson Estuarine Lab
- Gregg Hall 347G

The validation procedure for autoclaves will be as follows:

1) Confirm set up and calibration of the autoclave is per manufacturer’s requirements.


3) Perform three consecutive runs with a maximum load of solid waste. A spore test must be included in each run in the center of the load. All three spore tests must pass for the parameters set. The minimum amount of time for a 24”x30” bag of waste is 60 minutes. If the validation runs do not pass at 60 minutes, increase reside time in 15 minute increments until three consecutive runs pass.

4) Routine spore testing frequency will be based on how often waste is run through the validated autoclave. The Biological Safety Officer and the autoclave operators will decide on the frequency. At a minimum, quarterly testing is required.

5) A qualification run that includes spores should be run after autoclaves are serviced or there is a disruption of steam.
Appendix C: Sample Waste Log

A waste log similar to the below must be used for all validated autoclaves. The waste log must be completed for each waste run and the chemical indicator taped in the notes section. If a run fails or there is an error during the autoclave run, the operator must indicate corrective actions in the “notes” section.

<table>
<thead>
<tr>
<th>Date</th>
<th>Quantity</th>
<th>Type</th>
<th>Process Parameters</th>
<th>Did the Cycle Finish?</th>
<th>Print Name</th>
<th>Initials</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix D: Liquid Waste Collection Set-up

A = Primary collection flask. Disinfectant should be added to the flask prior to beginning waste collection.
B = Overflow collection flask. Disinfectant should be added to the flask prior to beginning waste collection.
C = In-line HEPA filter to protect the vacuum system (D).

Flasks A and B should be held in a secondary containment pan, pail or bin.