

Biological Waste Disposal

Controlling Laboratory Biorisks 2012

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



Course Objectives

- Be familiar with the vocabulary applicable to biological waste
- Classify and segregate different types of biological waste, and select appropriate collection and storage methods
- Understand the factors that influence selection of treatment and disposal approaches and technologies
- Create a matrix of methods to treat and dispose different kinds of biological waste.

What IS biological waste?

Small Group Activity, Part 1:

- What can be considered biological waste?
- Think of as many examples as you can and write each example on a single sticky note.
- You have 5 minutes.

Categories of Biological Waste

- Solid waste (non-sharp)
- Sharps
- Pathological Waste
- Liquid Waste
- Mixed Waste

Who Defines Biological Waste?

- Countries, States (Regulatory Agencies)
 - Laws
 - Regulations
 - Guidance
- Institutions
 - Policies

What IS biological waste?

Small Group Activity, Part 2:

- Distribute the sticky notes with examples of biological waste to each of your group members.
- Post each sticky note on the flip chart with the category of waste it fits under.
- You have 5 minutes.

Why pay attention to waste?

Reflection and Class Discussion:

- Who is at increased risk if waste materials contaminated with biological materials are not handled and treated properly?
- What are potential incidents that can occur?

Why pay attention to waste?

Small Group Activity:

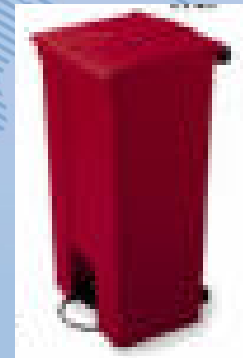
- Each group will be assigned one category of waste.
- Look at the examples of waste under each category and also your list of increased risks from improperly handled and untreated waste.
- Develop a process to mitigate the risk from this category of waste materials. A flow chart is a good way to visualize a process.

Write or draw your process in your workbook and also on your flipchart.

Steps in Waste Management

- Segregation
 - Collection
 - Storage
 - Transport
 - Treatment
 - Final Disposal
- Look at your process. Are all these components included? If not, add them into your process.

Non-Sharps Waste Collection



Sharps Waste Collection

- Sharps Containers
 - Closable and when closed not reopenable
 - Autoclavable?
- Container Size & Location are Critical
 - Minimize handling of used sharps
- Avoid Overfilling
- Cautions:
 - Container substitution
 - Container reuse



Waste Storage and Transport



Waste Treatment Options

- Cradle-to-grave responsibility applies
- Do it yourself ...
 - Standard practice for liquids
 - Autoclaves and other solid waste treatment devices generally require permitting, usually by local entity
 - Shredding probably required
- Have someone else do it ...
 - Very common, few contractors
 - Less liability but requires due diligence
 - Likely lower cost option unless quantities are large
 - Require your transporter to:
 - generate manifest of types and amounts of biowaste transported
 - provide certificate of destruction

Intermediate vs. Final Treatment

- Intermediate Treatment

- Usually performed for worker protection
- Autoclaving most common method
- Standard microbiology lab practice
- Performed before transport to final treatment

- Final Treatment

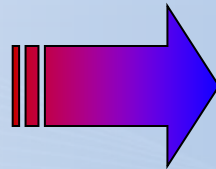
- Much more effort involved
 - Permitting
 - Monitoring
 - Recordkeeping
 - Reporting
 - Risk Management
- Two options:
 - On-site treatment by facility staff
 - Off-site treatment by disposal contractor

Treatment Technologies

- Autoclave
- Incineration
- Chemical treatment
- Microwave
- Alternative technologies
 - irradiation
 - high-temp pyrolysis (vitrification)
 - macrowave
 - others

Treated Biological Waste

- Biological solid waste that has been treated by an acceptable method is considered non-contaminated and non-hazardous; the liquid can be sewer-disposed and the solids put in sanitary landfills.
- Most localities require that decontaminated medical waste (especially sharps) be made unrecognizable before being landfilled. A shredding step must be included after treatment.



Pathological Waste Treatment



Liquid Waste Treatment

- Drain Disposal (*Sanitary Sewer*)
- Autoclave following *validated* procedures
- Chemical inactivation (e.g. 10% Chlorine Bleach overnight before drain disposal)
- Use Engineered Treatment System
 - Onsite
 - Offsite

Why pay attention to waste?

Small Group Activity:

- Look back at the process your group designed for management of the biological waste type you were assigned.
- Based on group and class discussion, as well as the additional information just presented, do you have any changes to your process?
- Finalize your process and present it to the group.

Review Course Objectives

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Thank You!

Don't forget to complete your evaluation!

