The background of the slide is a photograph of a sunset over the ocean. The sky is a deep blue with wispy white clouds. A bright sun is visible on the left side, creating a lens flare effect. A rainbow is visible in the sky, arching from the left side towards the center. The water in the foreground is dark blue with gentle ripples.

USDA APHIS
Highly Pathogenic Avian
Influenza Biomass Disposal
Support Tools

September, 2007

Contact Information

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USDA APHIS

Environmental Protection Program Manager

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Riverdale, Maryland 20737

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301-734-0626

Overview

- Introduction
- Emergency Operations planning
- Biomass Disposal Issues
- Response Tools

Introduction

- USDA APHIS mission – to protect American agriculture
- APHIS is lead Federal response agency for animal disease outbreak

Emergency Operations Planning

- APHIS Emergency Operations Center
- Incident Command Group
- Carcass Disposal Working Group

APHIS Carcass Disposal Working Group

- Over 150 members
- US, Canada, Australia, UK, Jamaica
- National and state governments
- Academia
- Industry
- Mission: to develop user-friendly, environmentally-sound disposal tools for responders in the field

Disposal Option Criteria

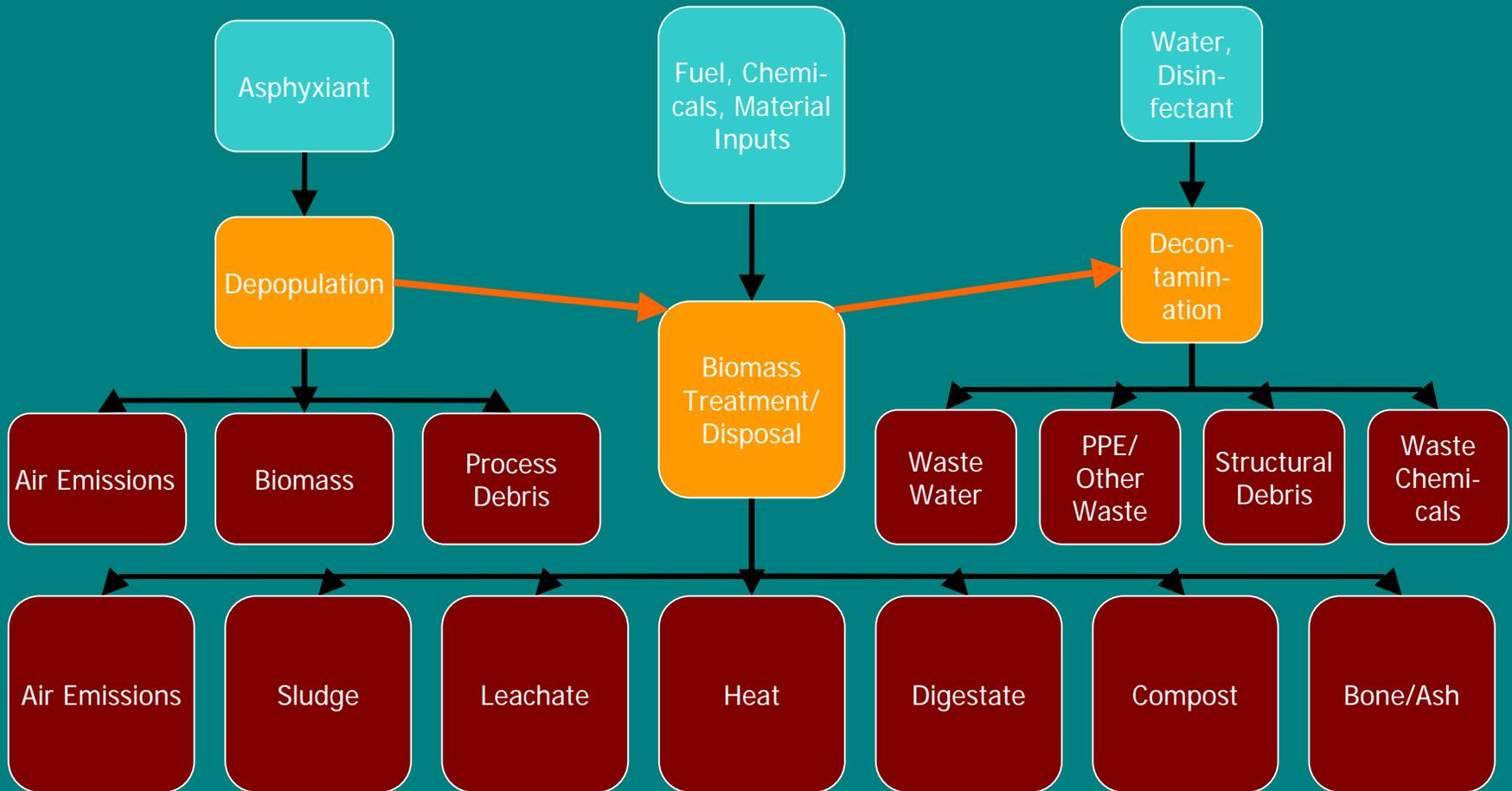
- Control outbreak spread
- Minimize adverse environmental impacts
- Applicable to various locations
- Minimize need for resources (funding, labor, chemicals, utilities, fuel)

Carcass Treatment/ Disposal Options

Disposal Option	Controls Spread of Pathogen	Applicable to Various Locations	Minimizes Inputs (capital, labor, energy, chemicals)	Minimizes Environmental Impacts
On Site Burial	Yes	Yes	Yes	No
Landfill	Yes	Yes	No	Somewhat
Incineration	Yes	Yes	No	No
Composting	Yes	Yes	Yes	Yes
Lactic Acid Fermentation	Yes	No	No	Potentially
Alkaline Hydrolysis	Yes	Yes	No	Somewhat
Anaerobic Digestion	Yes	No	No	Potentially
Preprocess Onsite and Transport	Potentially	Yes	Somewhat	Potentially

Subjective rankings based on “Carcass Disposal: A Comprehensive Review”, National Agricultural Biosecurity Center Consortium, August 2004.

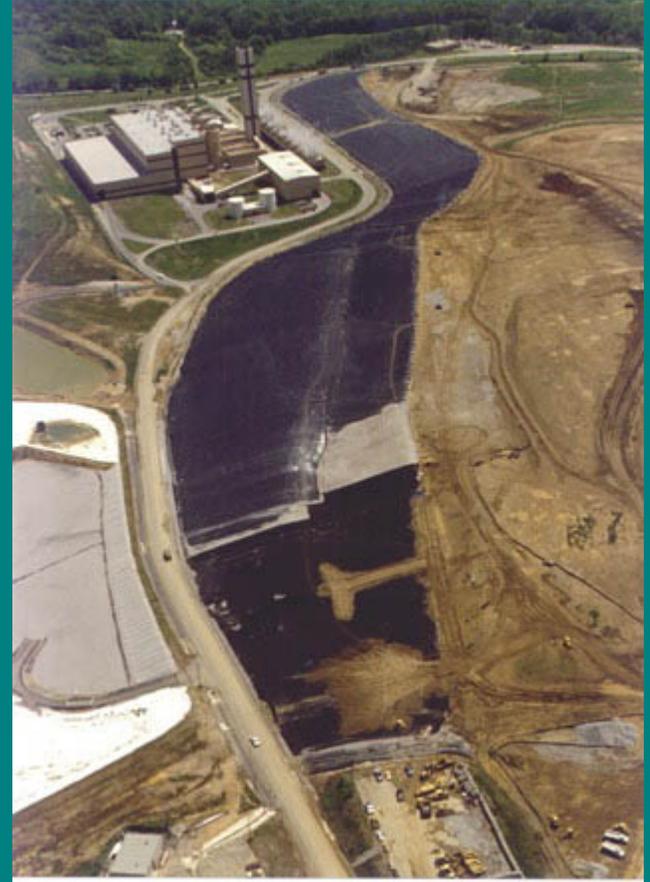
Response Process Components



Onsite Burial



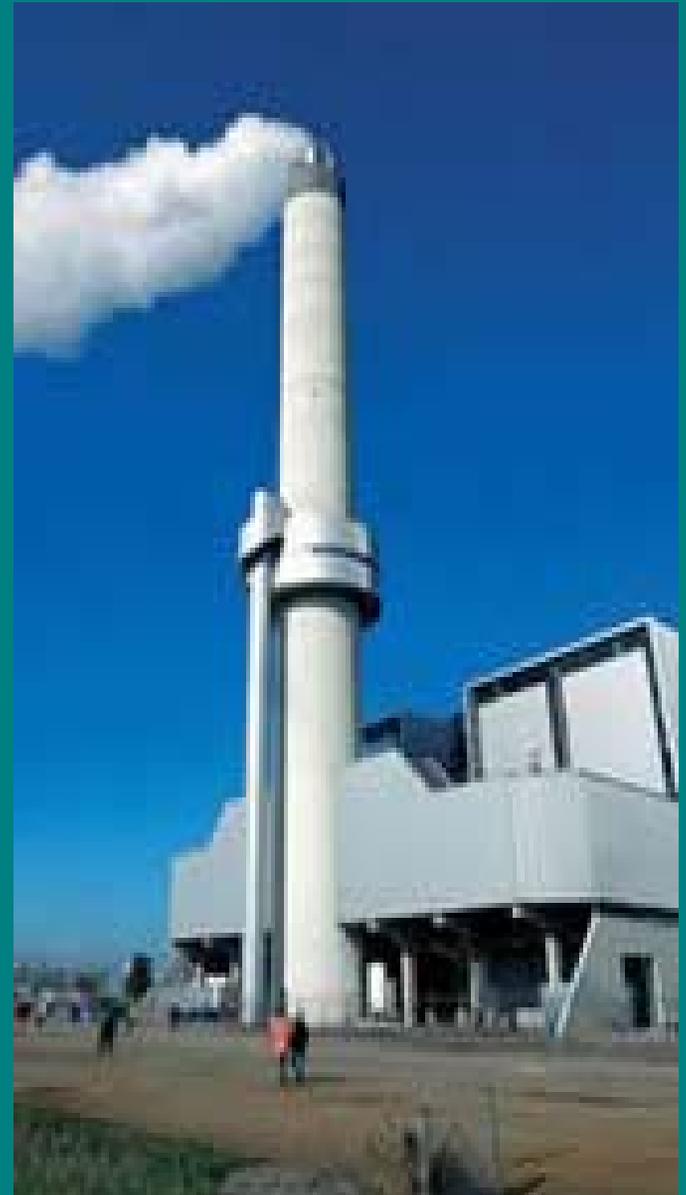
Landfill Disposal



Open Burning



Incinerators



Composting



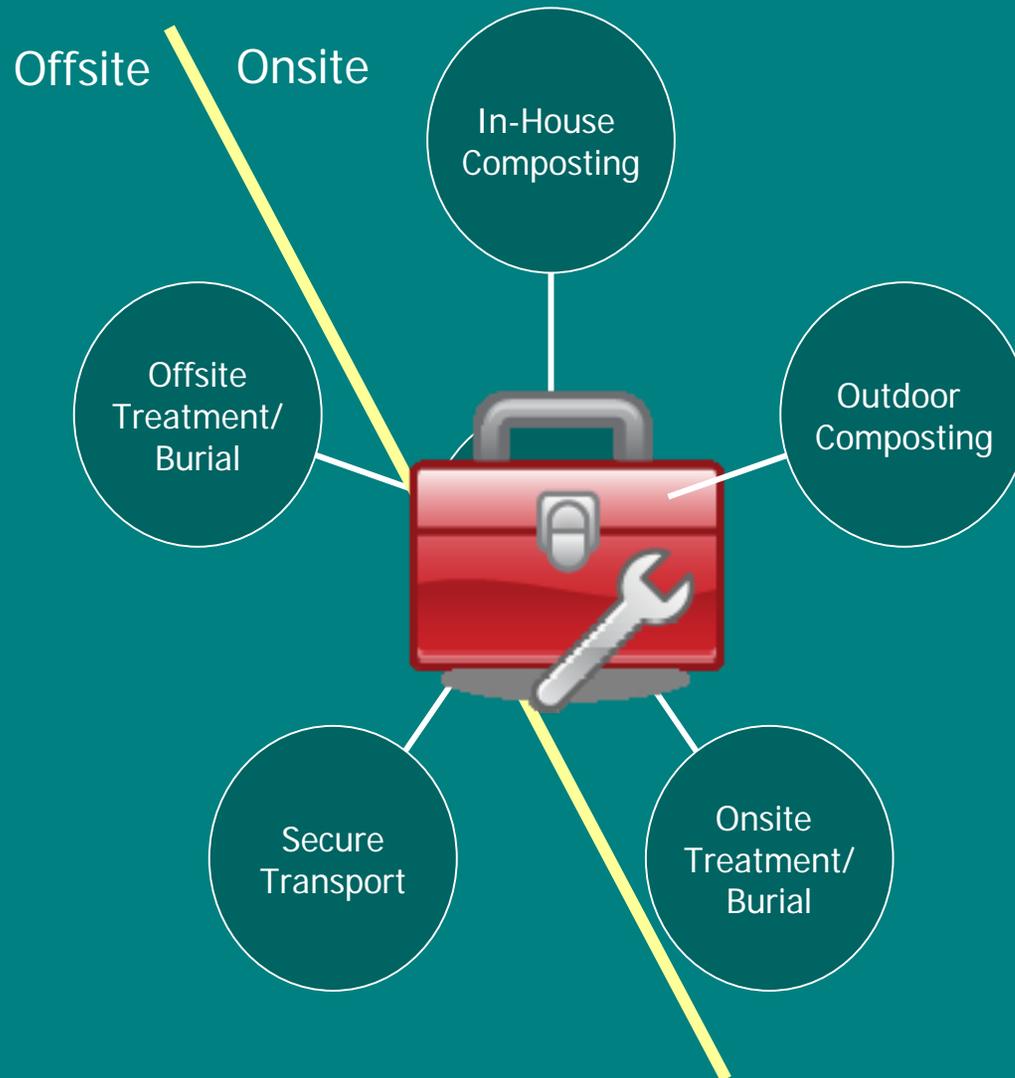
Tissue digesters



Facility Types



The Tool Box Approach



Tools Available or Being Developed

- In-House Composting training module (available)
- Outdoor Composting training module (available)
- Secure Transport training module (available)
- Off-site Treatment/Disposal training module (under review)
- On-site Treatment/Disposal training module (in progress)
- Cleaning and Disinfection training module (in progress)
- Depopulation training module (future)
- On-line Disposal Support Tool (available/in progress)
- Health and Safety Plan Template (available)
- HPAI Worker Protection Guidance (available)

1



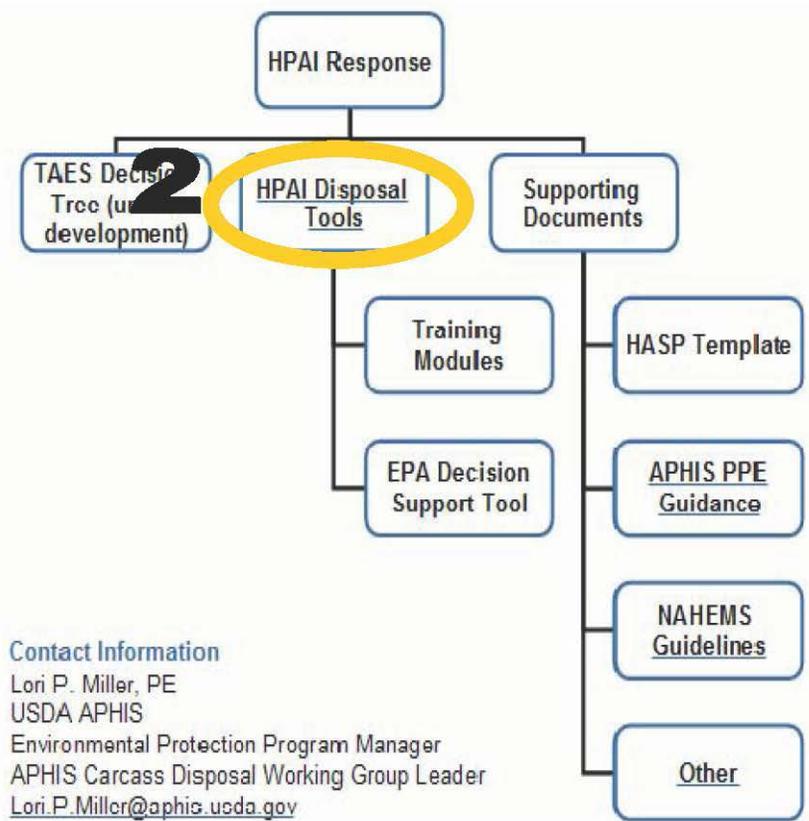
National Center for Animal Health Emergency Management

United States Department of Agriculture

Animal and Plant Health Inspection Service

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- [Report a Pest or Disease](#)
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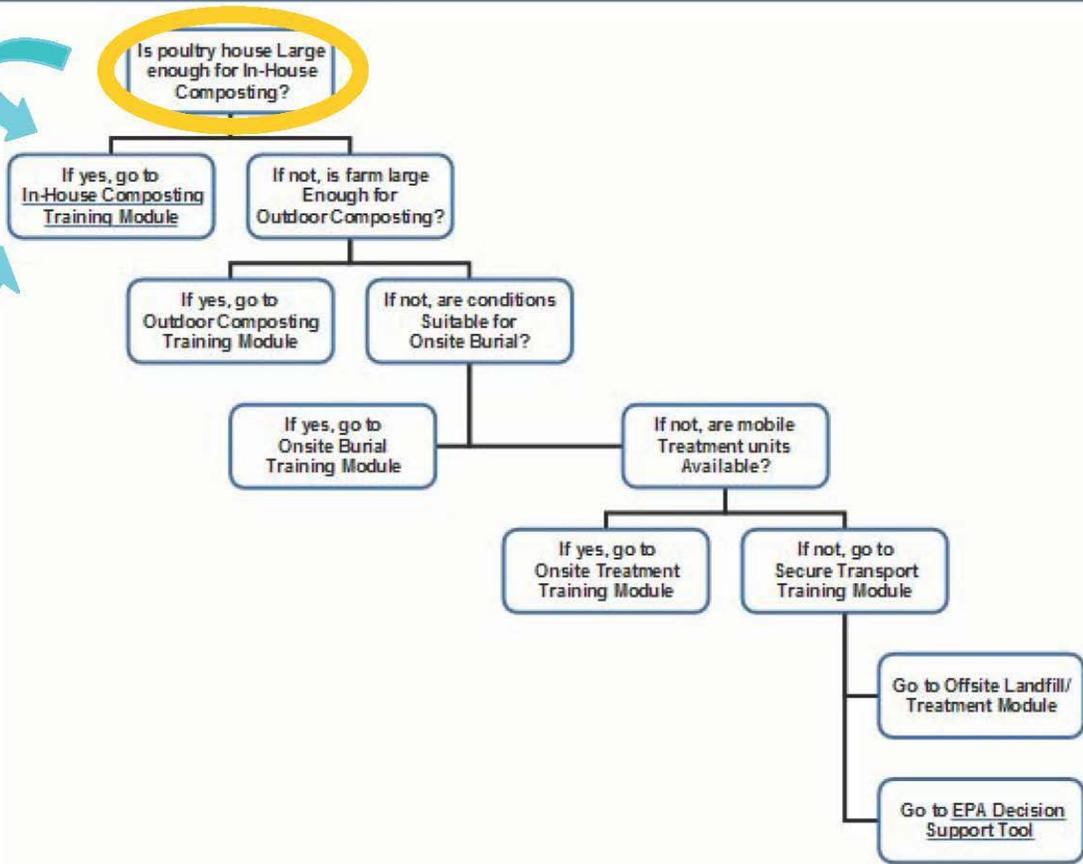
Mission

Function **3**

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Wednesday, February 14, 2007

In-House Composting

Select one of the following items:

- Introduction
- PPE for Avian Influenza
- ICS Disposal Unit
- Preparation for Composting
- Materials & Calculations
- Assembling a Windrow
- Monitoring, Turning and Disposal of Compost
- References
- Summary



5

**Public Access
Online Training Modules**

Interactive

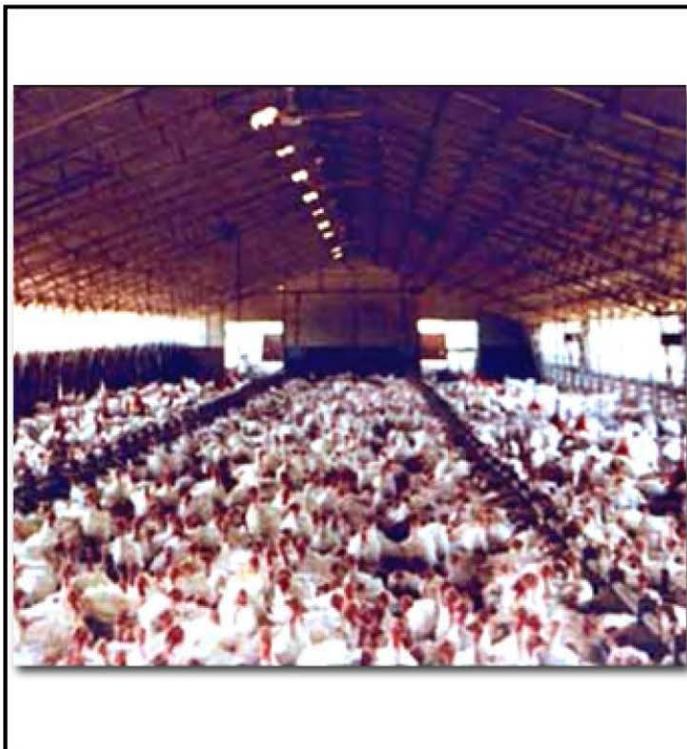


Considerations for In-House Composting

After assessing the facility, you must collect data about the poultry. This information will be used to calculate resources for composting operations.

The requirements for composting at a given site are influenced by the specifics of the site. These considerations include:

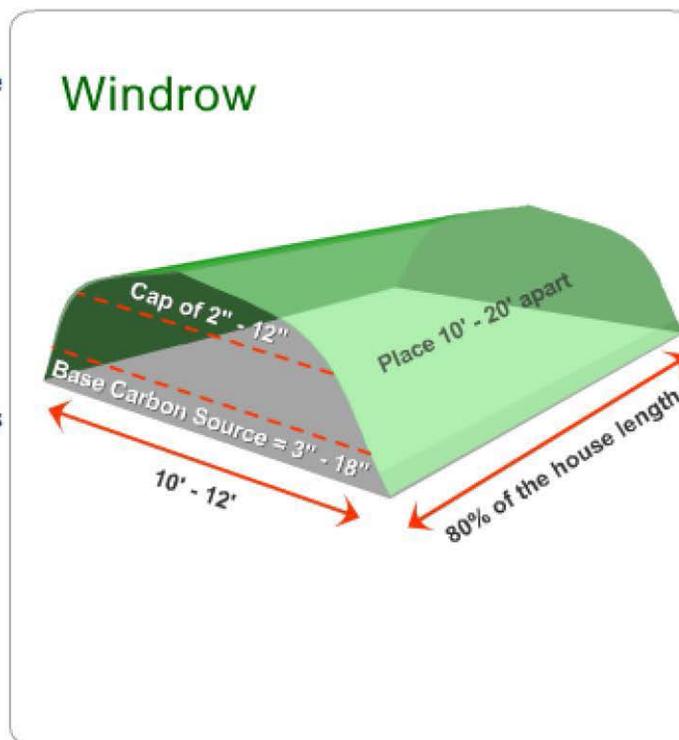
- [Bird species](#)
- [Average bird weight](#)
- [Production type](#)
- [Litter depth](#)
- [Litter moisture and condition](#)
- [Location of carcasses](#)
- [Ability to cap/turn piles](#)





Mixing and Piling (2 of 2)

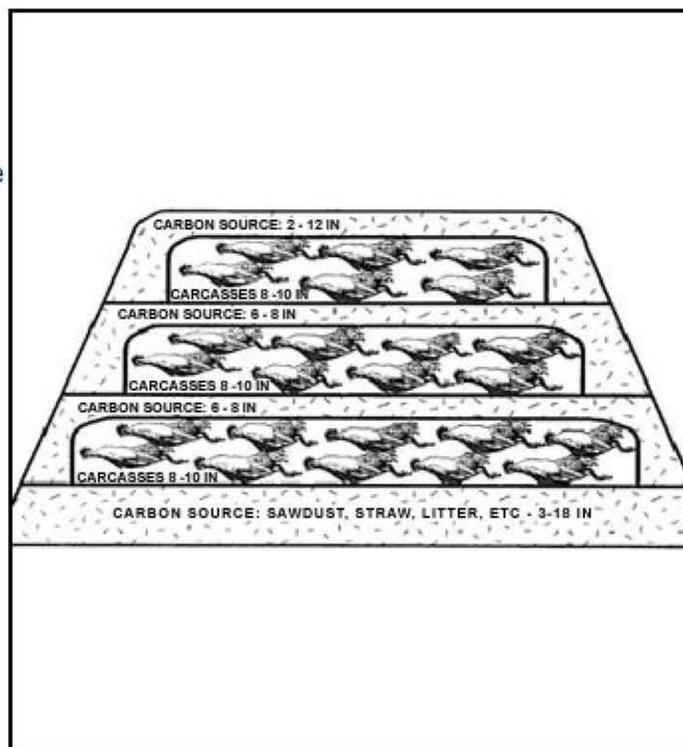
- Starting with a 3-inch minimum [base](#) of carbon source, use the feed line as a guide and mix the carcasses with the carbon source to start the formation of the windrow.
- Continue to roll the materials from along the sides together to form a windrow 10-12 feet wide in the center of the house or twice the reach of your loader so you can get to the middle from each side of the windrow.
- Cover (cap) the pile with a 2-12 inch thick [layer of litter or sawdust](#), covering all carcasses and bird parts





Layering (2 of 2)

- Spread carcasses evenly with rake or pitchfork until the carcass layer is 8 - 10 inches thick
- Deposit a 6 to 8-inch layer of clean carbon source over the birds with a foot overlap on the sides
- Repeat layering procedure as needed until the pile is 4 to 6 feet high, depending on height of ceiling
- Finish with a 2 to 12-inch layer of clean carbon source over the birds
- **Leave NO carcasses or bird parts exposed.**





Personal Protective Equipment (2 of 4)

PPE required for In-house composting operations (continued):

Respirator - Carcass disposal team members must use an N-95 or higher protection disposable particulate respirator that has been fit-tested and meet respiratory requirements defined by OSHA in 29 CFR 1910.

The following respirators satisfy OSHA requirements:

- 3M 8210, N-95
- 3M 8270, N-95
- 3M 8511, N-95
- Moldex 2700, N-95
- Survivair full-face respirators, 4000 series
- MSA Millenium full-faced respirators
- MSA Advantage 3000 full-faced respirators





Personal Protective Equipment (3 of 4)

Decontamination trailers may be incorporated into the carcass disposal operation. Workers may be transported from the carcass disposal site to the decontamination location where they will remove contaminated clothing, shower and don clean clothing prior to going home.

The following foot protection procedures apply on-site and at decontamination locations.

- Protective shoe covers or polyurethane boots that can be disinfected or discarded
 - Shoe covers should be put on when leaving your vehicle and taken off when getting back into the vehicle
 - Keep a trash bag in the car to dispose of them
 - Dirty feet never touch the inside of the vehicle
 - Spray shoes with disinfectant before getting back into your vehicle
 - Floor mats should be disinfected at the end of each day



Building Windrows Cont.

Treat Excess Contaminated Litter

Place excess contaminated litter in windrows to compost and deactivate pathogens.

Disinfect tools and site

- ✓ Disinfect all tools and equipment from house after forming windrows
- ✓ Disinfect site according to approved disinfection procedures

Turn up heat in poultry house

Turn up to 100F for 1-3 days to expedite composting process and eliminate the pathogens on surfaces.

Monitoring and Turning

Temperature Monitoring

1. Use a 3-foot long digital temperature probe connected to a data logger to take daily readings. Digital recording thermometers reduce the need to enter the building to once a week.
2. Use at least 2 probes per windrow. Best to have 1 at outside edge and 1 in center of windrow every 10 ft.
3. Put tip of thermometer in contact with carbon source layer at the center of the windrow.
NOTE: If the temperature reaches 180F, monitor and/or turn the hotspot to prevent fire hazard.

Turning windrows

1. Turn windrows when temperature drops below 125F.
2. Turn inside house, shifting windrows toward ends.
3. Scrape along edges of the turned windrow and deposit material on top.
4. Cap with at least 4 inches carbon source to cover any exposed tissue.
5. Cover pile with compost fleece or another suitable porous fabric to protect from scavengers. Do not use airtight cover as this will cause condensation and may negatively affect the composting process.
6. Secure the material using dirt and soil on the edges or some other means to restrict scavengers access.

Weight	1 st Turn	2 nd turn/removal
4lbs	10 days	20 days
10lbs	16 days	28 days

Post-turning monitoring

2-3 weeks after 1st turning, test compost for maturity using a test kit such as Solvita.

Disposal

2-3 weeks after the 1st turning, compost may be land applied and incorporated in accordance with the nutrient management plan for the soil and crop or hay. Total time may vary by locality and season depending on the temperature. The cooler the weather, the longer this process takes. If the temperature is below freezing, you may have to wait until spring before compost is assumed to be pathogen-free. If no growers are willing to take the mature compost, it should be landfilled as a nonhazardous waste.

Important Numbers and Websites

Numbers

State veterinarian _____
University extension _____

Websites



Procedures for In-House Composting of AI- Infected Poultry Carcasses

This brochure contains information about composting AI-infected poultry mortalities inside poultry houses. It's divided into four sections:

- ✓ Steps you can take now to prepare for in-house composting in the event you have to implement it.
- ✓ Composting procedures
- ✓ Procedures to follow after composting
- ✓ Contact numbers and websites

Preparation

If your poultry houses have enough ceiling clearance, in-house composting is a highly effective means to dispose of large numbers of poultry carcasses.

There are a number of steps you can take right now to prepare in the event of an outbreak.

- ✓ Obtain contact information for the proper authorities which may include: State veterinarian, poultry company personnel and university extension personnel.
- ✓ Identify any permits required to compost in your region especially those from APHIS and state/local environmental personnel.
- ✓ Determine the composting method best suited for your facility.
 - ❑ Mixing and Piling - ideal when carcasses are distributed more evenly over the litter surface. Less expensive than layering.
 - ❑ Layering - if depopulation concentrates carcasses in a small section of the house
 - ❑ Shredding and Piling - not preferred for highly pathogenic organisms
- ✓ Determine carbon source needs – This is the bulking agent used for moisture and odor control and as necessary ingredient for microbes to produce compost. Identify sources in advance.

Acceptable carbon sources include:

- ❑ Litter
- ❑ Silage
- ❑ Wood chips
- ❑ Corn husks
- ❑ Sawdust
- ❑ Bedding material
- ❑ Straw

Carbon Source Calculation Equations

$Pounds\ of\ Broiler\ Meat = (\#\ of\ birds) * (Avg\ weight)$

$Area\ of\ House = Length\ x\ width\ of\ house$

$Total\ Required\ Litter = \frac{Pounds\ Broiler\ Meat}{Area\ of\ House\ x\ 0.8}$ *

**or 1.0 for large turkeys or layering compost method*

$Average\ Litter\ Depth =$

$\frac{Sum\ litter\ depths\ in\ each\ part\ of\ house}{Number\ of\ parts\ of\ house}$ *

**converted to same units as length/width of house*

$Litter\ Available = (Avg\ litter\ depth) * (area\ of\ house)$

$Required\ Carbon\ Source\ Material = (Total\ litter\ required) - (litter\ available)$

Post Infection

Secure the infected site

- ✓ Rope off infected area and establish disinfection area
- ✓ Ensure disinfectant is contained and doesn't run offsite or to surface or ground water
- ✓ Prohibit entry into infected area unless personnel are properly trained, fit tested, and wearing personal protective equipment

Identify existing mortality storage areas and remove possible contaminants

- ✓ Move any carcasses and infected organic materials inside the building on the secured infected site
- ✓ Clean and disinfect the mortality storage area to eliminate the pathogen

Evaluate the site

Assess housing and inventory available supplies, equipment, materials in order to enable planning for the disposal of carcasses. Compile information compiled about:

- ❑ Bird age, species, avg. weight
- ❑ End door access to deliver carbon source and remove compost
- ❑ Production type (cage, floor, outdoor)
- ❑ Ability to turn piles
- ❑ House type
- ❑ Security – How to protect compost pile from scavengers, vandals or disease vectors
- ❑ Litter depth, moisture and condition
- ❑ Depopulation method/location of carcasses
- ❑ Poultry house type and dimensions including ceiling height [Sufficient clearance for front loader to make windrow 4 to 6 feet high?]

Inventory/Supplies

At least one day prior to composting event, obtain required items, including:

- ❑ Personal protective equipment
- ❑ Monitoring equipment
- ❑ Mixing equipment
- ❑ Carbon source
- ❑ Turning equipment

Till litter

If carcasses are confined to a portion of house and caking is extensive, till the litter in the house in order to enhance composting.

Final Preparation for Composting

- ✓ Let birds consume all feed
- ✓ Raise the feeder and drinker lines
- ✓ Depopulate

Building Windrows

Address health concerns

- ✓ Provide dust control measures if needed.
- ✓ Ventilate composting byproducts by opening one of the curtains part way or using one of the smaller ventilation fans on the building – filter ventilation to avoid pathogen spread.

Select composting method – See Preparation topic

Mixing and piling method

1. Remove carcasses one bucket-width wide from along the sidewalls and spread them evenly in the center of the house.*
 2. Starting with a 3-inch minimum base of clean carbon source, use feed line as a guide and mix the carcasses with the carbon source to start windrow.
 3. Continue rolling materials together to form a windrow 10-12 ft. wide or twice the reach of your loader so you can access the middle.
 4. Cover with 6-12 inches of litter or sawdust over all carcasses and bird parts.
- * If litter is inadequate and supplemental sawdust is required, this step is not required.

Layering method

1. Create a 3-inch thick base of clean carbon source. Make the base 10-12 feet wide or twice the reach of your loader so you can access the middle.
2. Place carcasses on top of base using loader.
3. Spread carcasses evenly with rake or pitchfork until the carcass layer is 8-10 inches thick.
4. Repeat layering procedure until the pile is 4-6 feet high, depending on height of ceiling.
5. Cover with 6-8 inch layer of clean carbon source with a foot overlap on the sides over all material.

Shredding and piling method

1. Remove carcasses one bucket-width wide from along the side walls and spread them evenly in the center of the house.
2. Either - Shred the carcasses using a tiller attached to a skid steer loader or a 3-point hitch, PTO driven unit for farm tractor.
 - At least 2 passes
 - Use sharp tines and high rpm.
 - Use the best angle and direction of rotation for shredding.
3. Alternate - Crush carcasses with a rubber tire loader and roll carcasses into the litter/sawdust windrow. Dust control may be issue.
4. Pile shredded carcass/litter mixture into a 12-14 foot wide by 3-5 foot high windrow.
5. Cap windrow with litter/carbon source to cover exposed carcasses.

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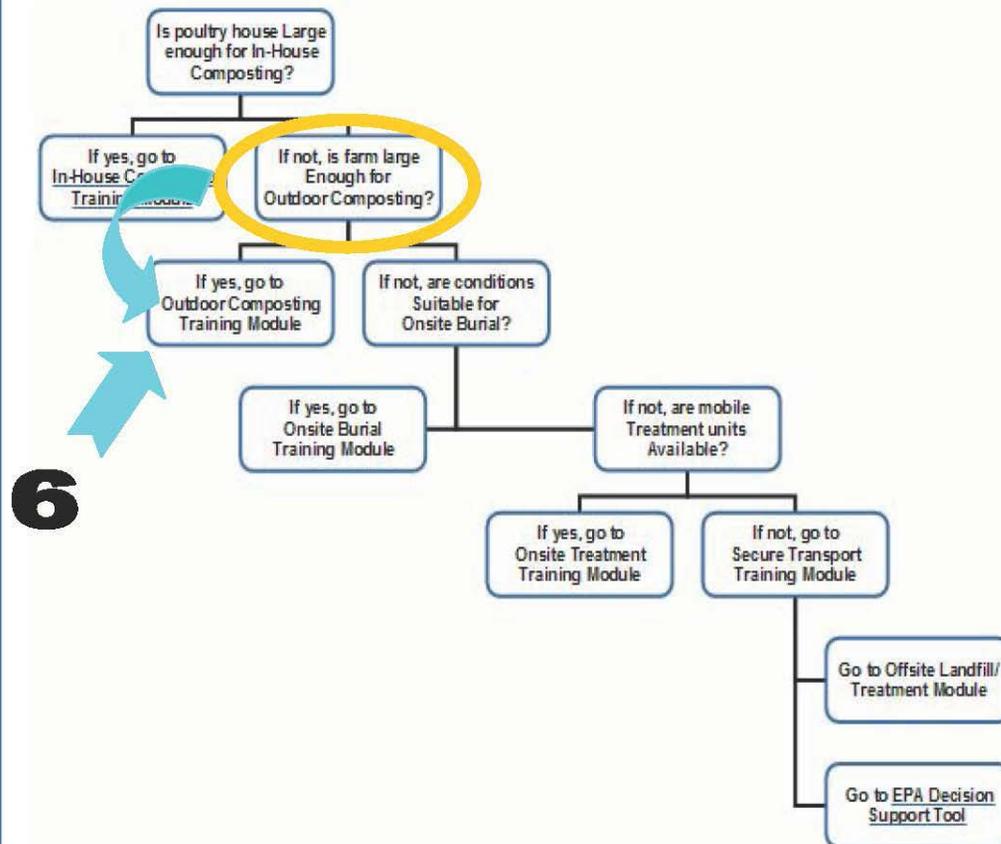
[Site Map](#)

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7 Outdoor Composting

- Course Introduction
- PPE for Avian Influenza
- ICS Disposal Unit
- Disposal Planning
- Obtaining Resources and Materials
- Preparation for Outdoor Composting
- Composting Carcasses
- Maintaining the Compost Site
- Summary

Conducting the Farm Evaluation (1 of 2)

The facility evaluation should be conducted as soon as possible but at least one day prior to carcass disposal operations. Regardless of the outdoor compost method used, the compost site should be:

- Located away from neighbors and/or out of sight
- Located downwind from neighbors and/or houses
- Located away from environmentally sensitive areas
- Located close to the poultry facility or have clear access for transport
- Clear of overhead utility lines
- Void of excess water
- Located on a gentle slope so there will be no water ponding



Selecting the Composting Method (1 of 3)

Composting can be carried out in a variety of configurations, namely windrow, compost bin, or compost bag.

- The windrow is the most popular for composting large carcasses or quantities of carcasses. Windrows are constructed on top of the ground in open spaces.
- Compost bins are three sided structures built from any material. Bin composting confines carcasses within a structure built from any material that is structurally adequate to confine the compost pile. Compost bins may be constructed with or without a roof.
- Compost bags are self-contained vessels that use a forced-air generation system to support composting.



Method	Advantages	Disadvantages
Windrow	<ul style="list-style-type: none"> • Forming and turning the windrow is simple since the windrow is not restrained by walls or roofs • The length of the windrow can be extended to accommodate the quantity of carcasses • Windrows are mounded to better control moisture, temperature, gases, and odors 	<ul style="list-style-type: none"> • Maintaining the windrow requires continuous monitoring and periodic turning
Compost Bin	<ul style="list-style-type: none"> • Simple • Low maintenance • Allows higher stacking of materials • Better use of floor space than free-standing piles • Elimination of weather problems • Containment of odors • Better temperature control 	<ul style="list-style-type: none"> • Impractical for large quantities of animals <ul style="list-style-type: none"> ◦ Usually 100 ft³ needed for every 1000 pounds of carcasses
Compost Bag	<ul style="list-style-type: none"> • Contains all material within the bag • Reduced compost time compared to windrow or bin methods * • Requires less land area for composting * • Reduces odors and leachate issues • Reduces potential for negative impact on the compost materials by inclement weather <p data-bbox="192 1358 738 1423">* Carcass Disposal: A Comprehensive Review, 2004</p>	<ul style="list-style-type: none"> • Not practical for composting larger carcasses unless they are ground and thoroughly mixed with an appropriate quantity of bulking agent • Requires specialized equipment and equipment operators • Different manufactured bags may have different dimensions <ul style="list-style-type: none"> ◦ Bags may be up to 200 feet in length and 5, 10 or 12 feet in diameter ◦ May hold 250 to 1000 yd³ depending on the diameter

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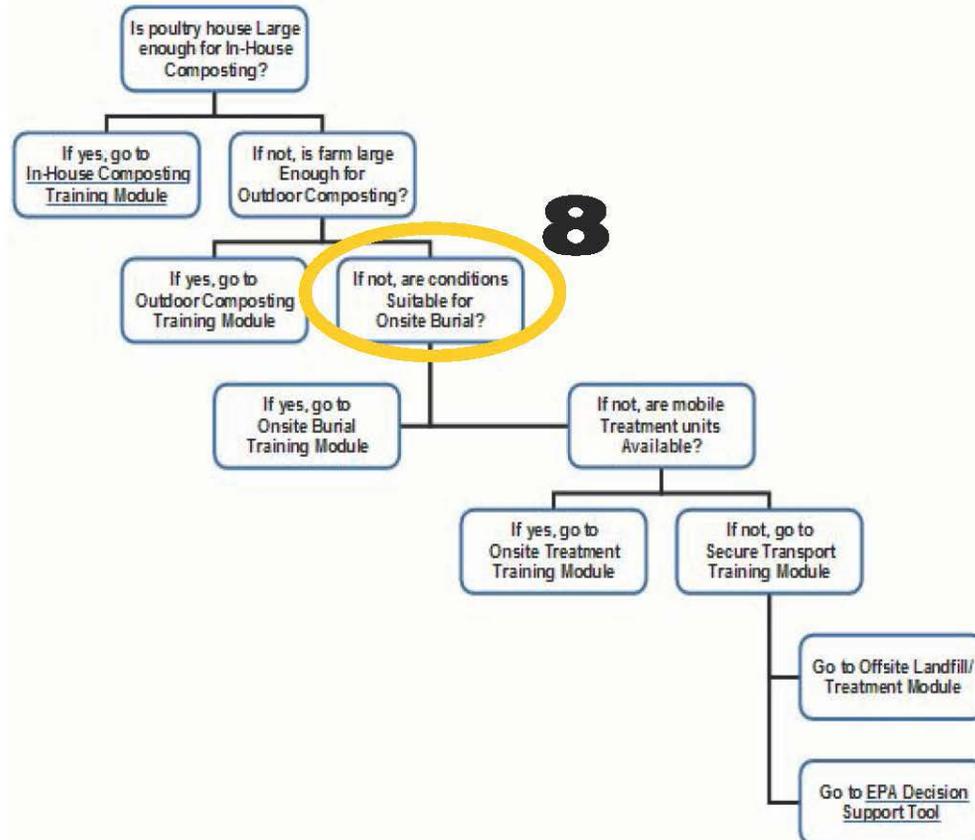
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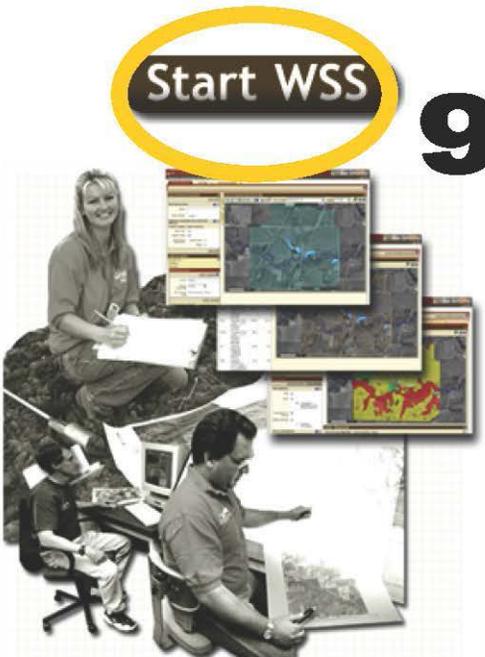


Wednesday, February 14, 2007

Access to soil survey information is provided through maps. All text and tables relate to the map symbols and the areas delineated on these maps. Persons with disabilities contact the [NRCS at the USDA Service Center](#) that services the county of interest. See also the [NRCS Accessibility Statement](#).

Before you start, see:

["Web Soil Survey—How To Use It" \(PDF\)](#)



Web Soil Survey

Version 1.1
[Maintenance Schedule](#)
[Supported Browsers](#)
[New features in version 1.1](#)
[Release Notes](#)

Welcome to the NCSS Web Soil Survey.

3 Basic Steps make WSS a simple yet powerful way to access and use soil data.

1 Define.



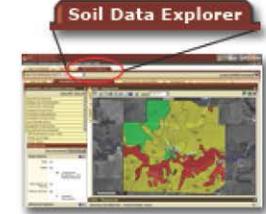
Use the Area of Interest tab to define the area you are interested in. You can define an area of interest from a choice list. You must complete this step before you can go on to the next two steps.

2 View.



Next, click on the Soil Map tab to view and print a map of the soils in your area.

3 Explore.



Third, click on the Soil Data Explorer tab to access soil data for your area. You can determine soil data for your area.

Filter By... **10**

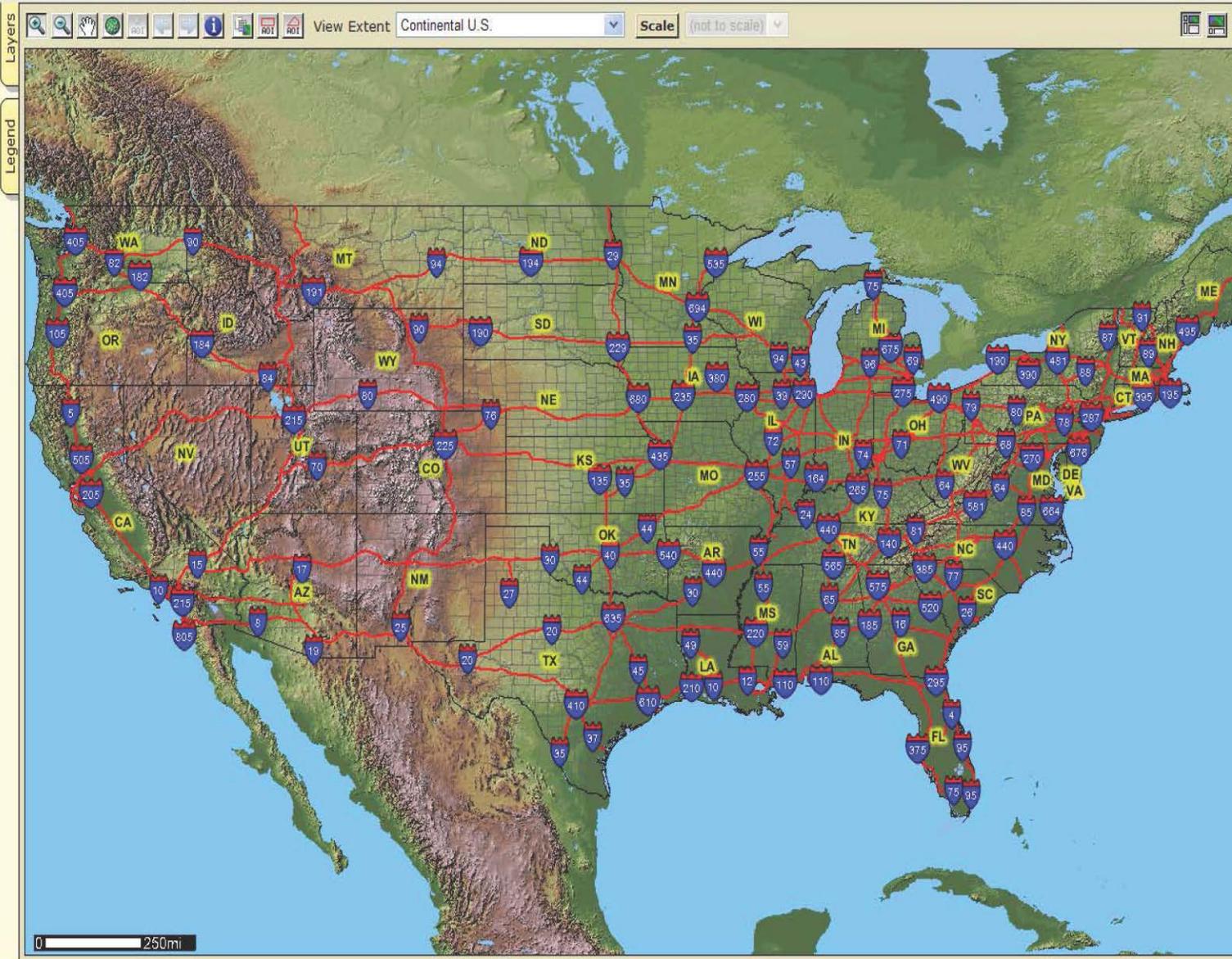
Address

Soil Survey Area

Latitude and Longitude

PLSS (Township and Range)

Hydrologic Unit



Layers Legend

View ?

1580 millersville rd

21108

View

gitude
(and Range)

View Extent Continental U.S. Scale (not to scale)



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Area of Interest Properties

Clear AOI

AOI Information

Name

Area (acres) 60.3

Soil Data Available from Web Soil Survey

Anne Arundel County, Maryland (MD003)

Soil Maps yes

Soil Data yes

Archived Soil Survey Manuscript no

Publication Maps no

Clear AOI

Quick Navigation

Navigate By...

Address

View

Address

City

State

Zip Code

Show Postal Code Layer in Map

View

County

Area of Interest Interactive Map

Layers Legend

View Extent Continental U.S. Scale (not to scale)

- Introduction to Soils
- Soils 101 **14**
 - What is soil? (less technical)
 - What is soil? (more technical)
 - How does soil form?
 - Parent Material
 - Climate
 - Living organisms
 - Landscape position
 - Time
 - What are soil horizons?
 - What is a soil scientist?
 - What is a soil survey?
 - Who uses a soil survey?
 - What is a map unit?
 - What is a consociation, complex, association, undifferentiated group, or miscellaneous area?
 - What is an Official Series Description?
- Information for Land Users
 - Homebuyers
 - Land Use Planners
 - Appraisers
 - Developers and Builders
- Waste Disposal Entities
 - Septic tank absorption fields
 - Sewage lagoons
 - Sanitary landfills
 - Disposing of other kinds of waste

Viewing Topics

A Table of Contents appears in the navigation panel to the left.

- Click an item in the Table of Contents to make it the **active topic** and view its content.
- To view an entire section, click the name of the section that contains the topics you want to view.

Saving or Printing Topics

Choose the topics you want to view, so they appear in the view panel, and then click **Create Printable Document**.

Suitabilities and Limitations Ratings

Open All Close All

Building Site Development

Construction Materials

Disaster Recovery Planning

Catastrophic Mortality, Large Animal Disposal, Pit

View Description View Ratings

View Options

Map

Table

Component Breakdown and Rating Reasons

Description of Rating

Rating Options

Detailed Description

Advanced Options

View Description View Ratings

Instructions

Viewing Suitabilities and Limitations Ratings

Suitabilities and limitations ratings are organized by category. Note that in cases where no ratings data is available for the AOI, folders and the ratings categories within folders disappear.

1. Open a ratings category in the panel to the left, and select a rating.
2. To learn more about the rating, click **View Description**.
3. In the **View Options** pane, select the items you want to view. For more information, click the help button.
4. Optional: To change the aggregation method as well as other advanced parameters, click on the **Advanced Options** pane and make changes. For more information, click the help button.
5. When ready, click **View Ratings**.

Note: The ratings results you get in Web Soil Survey are identical to those in Soil Data Viewer 5.0 or later.

15



Map Legend

- Soil Ratings
 - Very limited (Red)
 - Somewhat limited (Yellow)
 - Not limited (Green)
 - not rated or not available (White)
- Soil Map Units
- Hydrography
 - Water (Blue)
 - Roads (Grey)
 - Rails (Black)
 - Interstate Highways (Red)
- Cities
- Detailed Counties
- Detailed States
- Oceans



- Composting Medium and Final Cover
- Rubble and Debris Disposal, Large-Scale Event
- Land Classifications
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities
- Vegetative Productivity
- Waste Management
- Water Management

Tables - Catastrophic Mortality, Large Animal Disposal, Pit					
Summary by Map Unit - Anne Arundel County, Maryland					
Soil Survey Area Map Unit Symbol	Map Unit Name	Rating	Component Name (Percent)	Rating Reasons	Total Acres in AOI
AdA	Adelphia-Holmdel complex, 0 to 2 percent slopes	Very limited	Adelphia (50%)	Wetness	3.9
				Seepage	
				Cutbanks cave	
			Holmdel (30%)	Wetness	
				Seepage	
				Cutbanks cave	
CoB	Collington-Wist complex, 2 to 5 percent slopes	Somewhat limited	Collington (50%)	Cutbanks cave	11.1
DxC	Downer-Phalanx complex, 5 to 10 percent slopes	Very limited	Downer (45%)	Seepage	8.1
				Sand content	
				Slope	
				Cutbanks cave	
DxD	Downer-phalanx complex, 10 to 15 percent slopes	Very limited	Downer (45%)	Slope	8.6
				Seepage	
				Cutbanks cave	
			Phalanx (40%)	Slope	
				Adsorption	
				Cutbanks cave	
SaB	Sassafras fine sandy loam, 2 to 5 percent slopes	Very limited	Sassafras (75%)	Seepage	24.2
				Cutbanks cave	
SnB	Sassafras-Urban land complex, 0 to 5 percent slopes	Not rated	Urban land (35%)		3.6
			Woodstown (5%)		
			Matapeake (5%)		
			Hambrook (5%)		
SsA	Shrewsbury loam, 0 to 2 percent slopes	Very limited	Shrewsbury (75%)	Wetness	0.7
				Ponding	
				Cutbanks cave	

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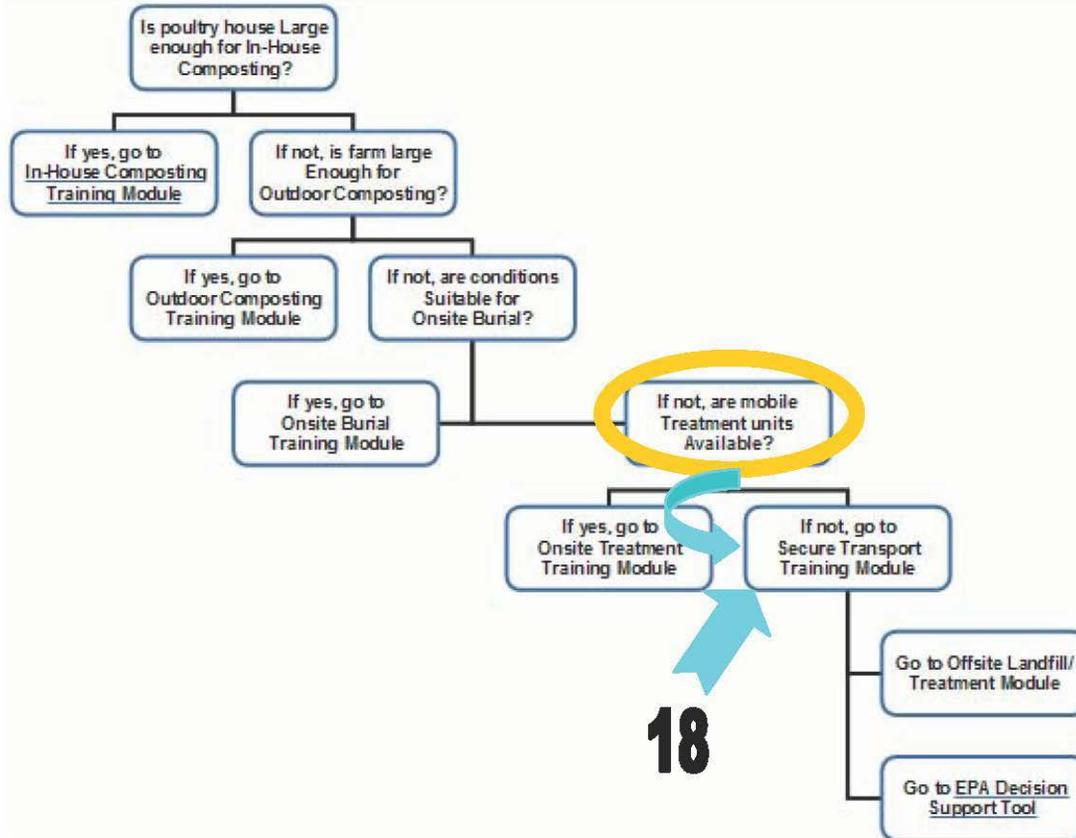
[Site Map](#)

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Wednesday, February 14, 2007

19 Secure Transportation

- Course Introduction
- Overview
- PPE for Avian Influenza
- ICS Disposal Unit
- Planning
- Loading and Unloading Procedures
- Emergency Situations
- Summary



Secure Transportation

Secure transportation includes protecting the health of personnel involved in the removal and transportation of HPAI-infected carcasses as well as containing the contaminated carcasses and byproducts during transport.

Containment of all HPAI-infected material within the transport is critical and may require particular vehicles equipped with an absorption or liquid collection system. The location of the selected disposal site will affect load requirements and limits for transportation.



Modes of Transportation (1 of 2)

AI-infected carcasses may be transported across the highways or by rail. The list below identifies different forms of highway transportation.

Highway:

- [Roll-off dumpster trucks](#)
- [Tractor trailers](#)
- Custom-built trucks
- Roll-off containers:
 - Solid waste - these containers are designed to carry solid/bulk waste and may not have closed seams.
 - Sludge - designed for transporting sludges or liquid waste products. These types of containers have continuously welded seams to prevent leaks.
 - Intermodal - container may be transported via truck or rail and normally have watertight seams and door seals.

Containers are normally available in 10, 20, 30 and 40 cubic yard sizes. The following sizes are recommended for transporting AI-infected carcasses and byproducts:

- [Twenty cubic yard containers](#)
- [Forty cubic yard containers](#)

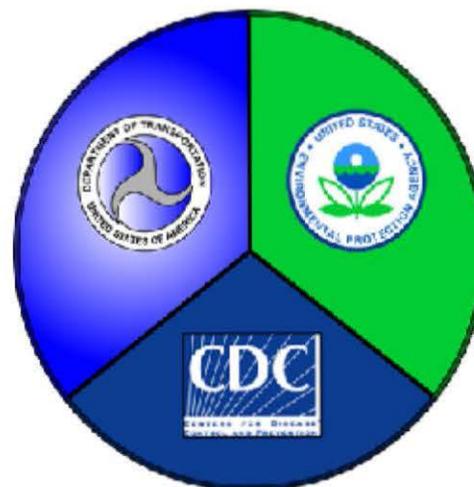


Rules and Regulations

Carcasses contaminated with highly pathogenic avian influenza (HPAI) are categorized as [Select Agents](#) and must be transported in accordance with Department of Transportation (DOT), Environmental Protection Agency (EPA), and Centers for Disease Control and Prevention (CDC) regulations. To view specific regulations, select here: [EPA's Suite of Disposal Decision Tools](#). If you are a first-time user, you may submit a request to the EPA's Administrator to obtain a userID and password.

Additional rules and regulations that may apply to carcasses are listed here:

- [Title 49 - Transportation](#) - DOT requirements for packaging and shipping hazardous materials.
- [9 CFR Part 121 - Possession, Use, and Transfer of Biological Agents and Toxins; Final Rule](#)
- [FMSCA hazardous materials regulations](#) - Provides links to rules and regulations governing transporting hazardous materials.
- [How to Transport Infectious Substances](#) - DOT guidance on transporting infectious substances.
- [Office of Hazardous Materials Exemptions and Approvals \(OHMEA\)](#) - This department issues the DOT exemptions to the hazardous materials regulations.



National Center for Animal Health Emergency Management

United States Department of Agriculture

Animal and Plant Health Inspection Service

Emergency Management Response

Identify a Pest or Disease

Emergency Response

Emergency Documents

Resource Library

FAQ

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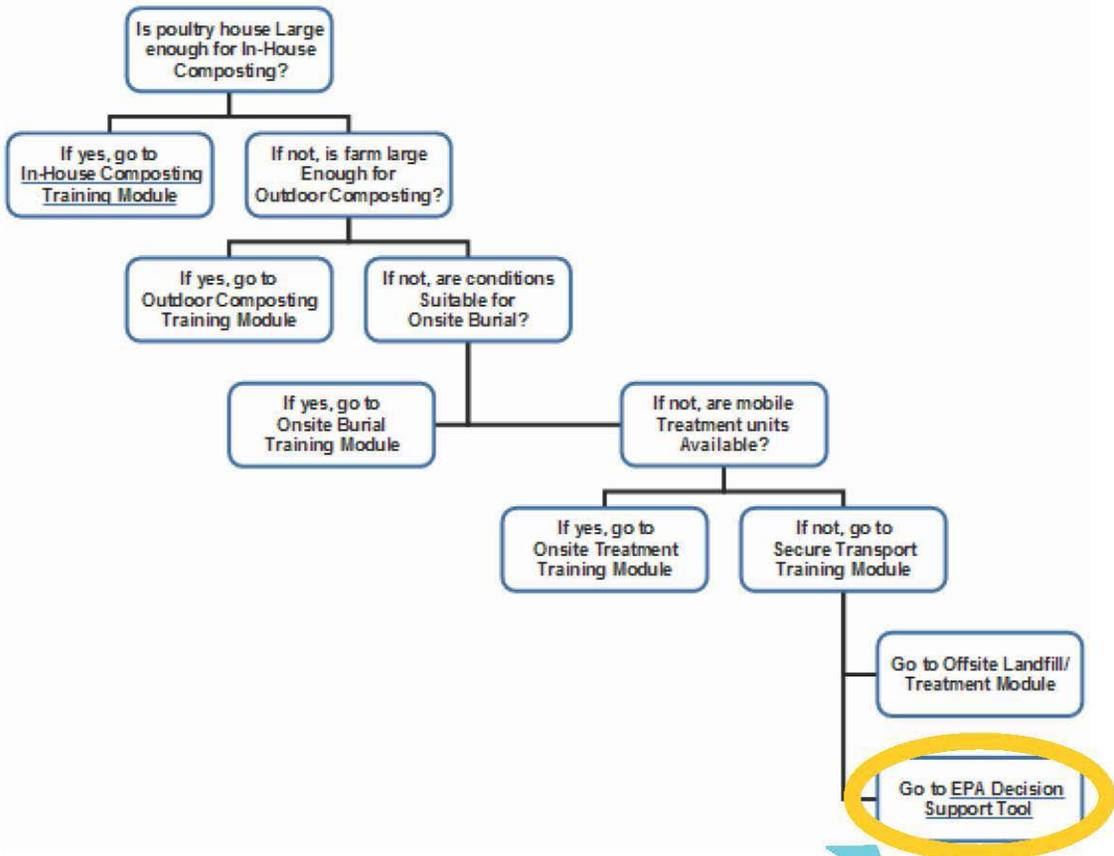
Monday, February 14, 2007

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EPA's Suite of Disaster Debris Management and Disposal (DDMD) Decision Support Tools

EPA's Suite of Disaster Debris Management and Disposal (DDMD) Decision Support Tools

Welcome to EPA's Suite of Disaster Debris Management and Disposal Decision Support Tools website. This website organizes large amounts of information related to disposal of debris resulting from incidents of national significance (e.g., contaminated buildings and water treatment systems). The tools can be used by emergency responders (e.g., EPA On-Scene Coordinators) and other individuals responsible for making disposal decisions to access technical information, regulations, and guidance to work through important disposal issues to assure safe and efficient removal, transport and disposal of waste materials. It is important to understand that the information provided here does not override existing regulatory or legal requirements that apply to the disposal of waste residues. This information should be used as a starting point for understanding some of the options available for disposal of these materials.

Information contained within the tools accessible from this website includes:

- Disposal Facility Information
- Building Residue Characteristics and Quantity Estimates
- Water Systems Material Characteristics and Equipment
- Agricultural Biomass Disposal Guidance
- Natural Disaster Debris Characteristics and Guidance
- Contaminant and Decontaminant Characteristics
- Transportation, Packaging, and Storage Information
- Worker Protection Information
- Library of Useful Resources

Login

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A UserID and password are required to access the tool. [Request a UserID and Password](#) or enter your UserID and Password to get started.

UserID:

Password:

Login

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EPA's Suite of Disaster Debris Management and Disposal (DDMD) Decision Support Tools

Home

You can access any of EPA's Suite of Disaster Debris Management and Disposal Decision Support Tools (DST) by clicking the links below. The tools can be used by emergency responders (e.g., EPA On-Scene Coordinators) and other individuals responsible for making disposal decisions to access technical information, regulations, and guidance to work through important disposal issues to assure safe and efficient removal, transport and disposal of waste materials.

[Building Decontamination Residue Disposal Decision Support Tool](#)

[Decontamination Wastewater Disposal Decision Support Tool](#)

[Water System Materials Disposal Decision Support Tool](#)

[Agricultural Biomass Disposal Decision Support Tool](#)

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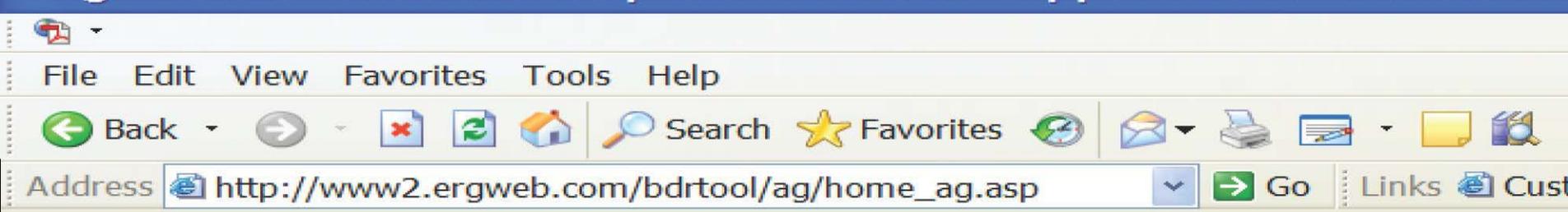
[Natural Disaster Debris Disposal Decision Support Tool](#)

Radiological Dispersion Device (Dirty Bomb) Debris Disposal Decision Support Tool — Not Yet Available

It is important to understand that the information provided in these tools does not override existing regulatory or legal requirements that apply to the disposal of materials. This information should be used as a starting point for understanding some of the options available for disposal of these materials. Final disposal decisions can only be made after contacting the appropriate people at state and Regional regulatory offices and coordinating with the disposal site.

More detailed instructions for using the tools are contained in the [Help System](#).

If you are a first-time user, or would like information on the Background, Status and Future Plans of the tool, and a discussion of the Design Philosophy and Technical Approach we have applied to the



Agricultural Biomass Disposal Decision Support Tool

Disposal Options

Lessons Learned

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[View Facility Info](#)

[View Pathogen Info](#)

[View Transportation Regulations](#)

[View Other Guidance](#)

[Training Modules](#)

[Change Password](#)

Home

The Agricultural Biomass Disposal Decision tool is intended to provide guidance to personnel who are responsible for disposing of animal carcasses or plant materials in the aftermath of an event. The U.S. Department of Agriculture has developed several training modules that can be accessed within the tool by clicking Disposal Options from the left navigation menu. Access to several other key resources for additional guidance is provided via the hyperlinks below:

- [National Center for Animal Health Emergency Management](#) [Exit Disclaimer](#) ►
- [National Animal Health Emergency Management System \(NAHEMS\) Guidelines](#) [Exit Disclaimer](#) ►
- Carcass Disposal Rule Root: Best Practices Handbook - Not yet available.

It is important to understand that the information provided in these tools does not override existing regulatory or legal requirements that apply to the disposal of materials. This information should be used as a starting point for understanding some of the options available for disposal of these materials. Final disposal decisions can only be made after contacting the appropriate people at state and regional regulatory offices and coordinating with the disposal site.

More detailed instructions for using the tools are contained in the [Help System](#).

***Note that you will be required to re-login after 15 minutes of inactivity.**

View Facility Information

You may customize the list of facilities generated by applying one or more of the following filter criteria. To view all facilities, leave the selection boxes blank. Click View List of Facilities to generate a list of facilities that meet all of the specified criteria.

Filter Criteria

Disposal Facility
Types:

25



Inert or Construction and Demolition (C and D) Landfills
Large Landfills (largest by state based on acceptance rate)
Municipal Solid Waste (MSW) Landfills
RCRA Subtitle C (Hazardous Waste) Landfills
Transfer Stations

(Hold down the CTRL key to select multiple facility types)

APCDs:

Select an APCD

(APCDs are associated with combustion facilities only; therefore, selecting an APCD will produce results containing only combustion facilities.)

State:

26



DC - DISTRICT OF COLUMBIA
DE - DELAWARE
FL - FLORIDA
GA - GEORGIA

(Hold down the CTRL key to select multiple states)

EPA Region:

Region 1 (CT, ME, MA, NH, RI, VT)
Region 2 (NJ, NY)
Region 3 (DE, MD, PA, VA, WV, DC)
Region 4 (AL, FL, GA, KY, MS, NC, SC, TN)

(Hold down the CTRL key to select multiple EPA regions)

View List of Facilities

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Agricultural Biomass Disposal Decision Support Tool

View Candidate Disposal Facilities

The list of candidate facilities matching your criteria are listed below. For your reference, the criteria used to conduct this search are also listed below.

Filter Criteria:

Municipal Solid Waste (MSW) Landfills

State(s): DE - DELAWARE

Universe of Facilities



Save to File

Print Facilities

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Name	Address	State	EPA Region	Contact Information	Select All This Page
Cherry Island Northern Solid Waste Management Center	706 East 12th Street, Wilmington	DE	3	Mr. Tom Houska, P.E. (302) 739-5361	<input type="checkbox"/>
Delaware Central Solid Waste Management Center	1107 Willow Grove Road, Kent County Route 10, Sandtown	DE	3	Mr. Tom Houska, P.E. (302) 739-5361	<input type="checkbox"/>
Jones Crossroads Landfill	Rt. 20 between Millsboro and Seaford., P.O. Box 455, Dover , 19903, Georgetown	DE	3	Mr. Mark Mallamo (302) 875-3448	<input type="checkbox"/>
NSWMC New Castle County	Intersection of 12th St & Hay Rd, I-495 (Exit 3 - 12th Street), New Castle	DE	3	Mr. Ann Marie Andrzejewski (302) 577-3457	<input type="checkbox"/>

Page: 1

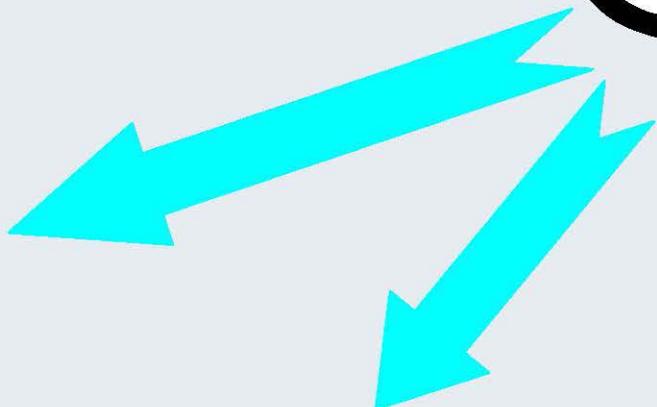
Make a New Selection

Owner

Owner Type: Public
Mr. Tom Houska, P.E.
Chief of Administrative Services
Engineering & Operations
Phone: (302) 739-5361
Fax: (302) 739-4287
Delaware Solid Waste Authority
P.O. Box 455, 1128 South Bradford Street
Dover
DE
199030455

Operator

Operator Type: Public
Delaware Solid Waste Authority
Mr. Ann Marie Andrzejewski
Facility Manager
1101 Lambson Lane
New Castle, DE 19720
19720
Phone: (302) 577-3457



Facility Information

Capacity: 2,310,000 tons/day
Operating Times: Mon-Fri 7am-5pm, Sat 7am-3pm
Operating Days per Year: 312
Permit number: SW-93/02, SW-95/04
MSW Acceptance Rate (tons/day): 504450.96
MSW Tip Fee (\$/ton): 59
C&D Acceptance Rate (tons/day): 10920
C&D Tip Fee (\$/ton): 59
Total Waste Acceptance Rate (tons/day): 567550.12
Total Waste Tip Fee (\$/ton): 59
Facility Size: 342 acres

Related Websites

Facility Information
<http://www.dswa.com/>

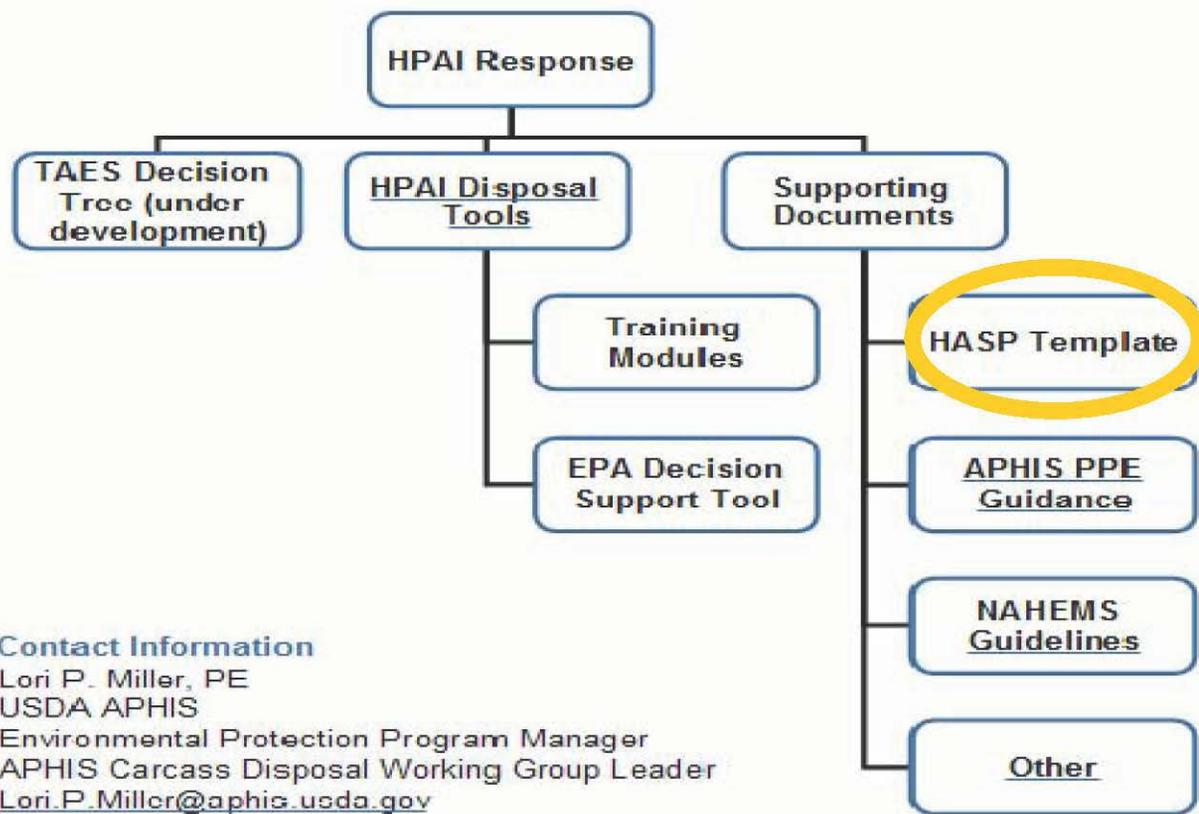
National Center for Animal Health Emergency Management

United States Department of Agriculture

Animal and Plant Health Inspection Service

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the EMOC
List

Mission Functions Staffs Search



Contact Information

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USDA APHIS
Environmental Protection Program Manager
APHIS Carcass Disposal Working Group Leader
Lori.P.Miller@aphis.usda.gov

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- 1 Introduction
 - 1.1 Scope
 - 1.2 Applicability
 - 1.3 Overview of Operation
 - 1.4 Administration

- 2 Key Personnel/Identification of Roles and Responsibilities
 - 2.1 Overview
 - 2.2 Specific Responsibilities

- 3 Hazard Analysis
 - 3.1 Hazard Analysis
 - 3.2 Job Hazard Analysis

- 4 Training Requirements
 - 4.1 Basic Health and Safety Training
 - 4.2 Safety Briefings

- 5 Personal Protective Equipment
 - 5.1 Introduction
 - 5.2 PPE Levels
 - 5.3 PPE Selection and Use
 - 5.4 Obtaining and Disposing of PPE
 - 5.5 Training
 - 5.6 General Guidelines

- 6 Medical Surveillance Requirements
 - 6.1 Purpose
 - 6.2 Application

- 7 Monitoring
 - 7.1 Introduction
 - 7.2 Sampling Methods
 - 7.3 Non-Invasive Operations
 - 7.4 Invasive Operations
 - 7.5 Equipment

- 8.3 Work Zones
- 8.4 Accountability

- 9 Decontamination Procedures
 - 9.1 Introduction
 - 9.2 Contamination Prevention
 - 9.3 Specific Decontamination Procedures
 - 9.4 Level A and B Decontamination
 - 9.5 Other Decontamination/Disposal Procedures
 - 9.6 Respirator Decontamination Procedures
 - 9.7 Reusable Equipment Decontamination
 - 9.8 Disposable Equipment
 - 9.9 Heavy Equipment
 - 9.10 Personal Hygiene
 - 9.11 Monitoring the Effectiveness Of Decontamination

- 10 Emergency Response/Contingency Plan
 - 10.1 General Principles
 - 10.2 Emergency Response Preparations
 - 10.3 Evacuation Procedures
 - 10.4 Shelter in Place Procedures
 - 10.5 Response to Specific Emergencies
 - 10.6 Incident Reporting
 - 10.7 Contingency Plan and Other Procedures
 - 10.8 Termination
 - 10.9 Training
 - 10.10 Critique and Update

- 11 Confined Space Entry
 - 11.1 Overview
 - 11.2 Recognition
 - 11.3 Administration

- 12 Container Handling/Spill Prevention and Containment
 - 12.1 Potential Spills and Available Controls
 - 12.2 Initial Spill Notification and Response
 - 12.3 Spill Evaluation and Response
 - 12.4 Post-Spill Evaluation

- 11 Emergency Procedures
- 12 Spill Response Equipment/Confined Space
- 13 Daily Report Form
- 14 Final De-Briefing Form
- 15 New Safety Officer De-Briefing

- 2-A OSHA 300 Form 1-1-04.pdf
- 2-B CA-1 Federal Employee's Notice...
- 2-C CA-2 Notice of Occupational Disease
- 2-D SF91 Auto Accident Form
- 3-A Hazard Analysis Example
- 3-B Job Hazard Analysis Blank
- 3-C Job Hazard Analyses
 - 1. Public
 - a. APHIS 515-R
 - b. APHIS 259
 - 2. Unknown Locations
 - a. Haz-Com
 - 3. Driving Car
 - a. Auto Accident Report
 - 4. Driving ATV
 - a. HOSTA Guideline
 - b. ATV Riding Tips
 - 5. Material Handling
 - a. Back Safety Handouts
 - b. Lifting-Moving Concerns
 - c. Material Handling Ergonomics Program
 - 6. Reaching Hazardous Locations
 - a. Heat Stress
 - b. Cold Stress
 - c. Poison Ivy, Oak and Sumac
 - d. Insect Hazards
 - e. Reptiles
 - f. High Elevations
 - 7. Working with Large Animals
 - a. Animal Handling
 - 8. Working with Small Animals
 - 9. Physical Cleaning of Large Animals
 - 10. Physical Cleaning of Small Animals

12. Use of Firearms
13. Disinfecting of Areas
 - a. Selection and Use of Disinfectants
 - b. One Stroke MSDS
 - c. Virkon MSDS
14. Drawing Blood-Other Sample from Large Animals
15. Drawing Blood-Other Sample from Small Animals
16. Physical Removal of Plants by Motorized Vehicle
17. Physical Removal of Plants by Hand Applications
18. Transportation of Small Animals
19. Transportation of Large Animals
20. Application of Pesticides-Herbicides by Motorized Vehicles
21. Application of Pesticides-Herbicides by Air Craft
22. Disposal of Animal Carcasses
23. Physical Handling and Containment of Biological (insect and plant) Samples
24. Placement of Bait Stations-Traps

3-D Job Safety Analysis Preparation

4-A Safety Messages

1. Accidents Happen
2. Ankle Sprain
3. Athletes Foot
4. Blood Borne Pathogens
5. Bees and Wasps
6. Black Widows
7. Blisters
8. Cold Weather
9. Confined Space Precautions
10. Decontamination
11. Dew Rash
12. Do Not Drink and Drive 32305
13. Do Not Drink and Drive
14. Driving in Sand
15. Driving Safety
16. Employee Injuries
17. Eye Fungal Infection
18. Fire Ants
19. Food Safety
20. Foot Care Facts

29. Heat Stress Basics
30. Ladder Safety
31. Life Hammer Safety
32. Lightning
33. Mold
34. Mosquitoes
35. MSDS Part 1
36. MSDS Part 2
37. Noise
38. Not in My Fridge
39. Pesky Critters
40. Preventing Carpal Tunnel
41. Reading the MSDS Brief
42. Respirator Fit-Testing
43. Safe Lifting
44. Safe Side of Corrosives
45. Safe Side of Oxidizers
46. Safe Side of Solvents
47. Safety Attitude
48. Safety in the Field
49. Security
50. Snatch Strap Safety
51. Sprains and Strains
52. Sunburn
53. Sun Burns
54. Sun Safety
55. Tetanus
56. Tick Safety
57. Tornadoes
58. Universal Blood and Body Fluid Precautions
59. Working in Tall Grass
60. Workplace Violence

5-A Why PPE

5-B PPE Selection

5-C Respiratory Protection

5-D PPE Form

6-A Self-Certification

6-B Cholinesterase Testing Program

10-B Shelter in Place
10-C Part 1 Disaster Information
10-D Thunderstorms
10-E Winter Storms
11-A Confined Space Program
12-A Container Integrity and Labeling Checklist
12-B Spill Response Kits
12-C Spill Kit Locations
12-D Overpacking Operations Guidelines

|

Health and Safety Plan (HASP) Template (Example HASP Forms)

- **Hazard Analysis**

- Under each type of hazard, list the specific hazards present:

- Physical:

- _____
- _____
- _____
- _____
- _____
- _____
- _____

- Biological:

- _____
- _____
- _____
- _____
- _____
- _____
- _____

- Chemical:

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Example HASP Forms (cont'd.)

Personal Protective Equipment

Required PPE for

Position: _____

Check box if used and fill in type of PPE on provided line

Eye Protection

Feet Protection

Head Protection _____

Hand Protection _____

Skin Protection _____

Respiratory Protection _____

Required PPE for

Position: _____

Check box if used and fill in type of PPE on provided line

Eye Protection

Feet Protection

Head Protection _____

Hand Protection _____

Skin Protection _____

Respiratory Protection _____

JOB HAZARD ANALYSIS (JHA)

Date: 04-01-06

X New J
Revise

Task: Working with Large Animals

JHA #7

Page _1_

Task Overview:

APHIS personnel will be working around animals of large (50 lbs. or greater) size and weight. Various tasks w
animals

Task Elements:

-Working around large animals

Personal Protective
Equipment:

Work clothes, Dust mask, air purifying respirator, safety glasses, nitrile (exam) gloves, work gloves

Tools and Equipment:

OCCUPATIONAL HEALTH CONCERNS**Chemical Agents:**

Various possible

Physical Agents:Bites/scrapes/gorges
Stepping on/falling on**Biological Agents:**Allergic reactions
Animal borne pathogens**Activity/Sequence of Job Steps****Potential Hazards/ Injury sources****Safe Action or P**Working with possible chemically contaminated
animals

Bites/scrapes/gorges

- If the animal is contaminated w
chemical agent, the APHIS Saf
follow the procedures of the Inc
- APHIS personnel should have a
animal behavior and character
animals. A number of articles d
are provided (see appendix 3-7
The appendix can be used to p

		<ul style="list-style-type: none">• Basic biosecurity precautions s supplemental information below borne diseases.
--	--	---

* Supplemental Information

Basic Disease Transmission Prevention

- Wear disposable boots or rubber boots that can be disinfected, if you must visit farms.
- Wash clothing and footwear using an APHIS approved disinfectant after contact with foreign livestock or poultry.
- Clean nostrils and fingernails and wash hair thoroughly after contact with foreign livestock or poultry.
- Dispose of clothing, shoes, equipment, cameras, and other items that are difficult or impossible to disinfect.
- Keep clean clothing and footwear available for visitors to wear if they must be around your livestock or poultry.
- Provide shower-in, shower-out facilities if possible.
- Discourage handling of animals by all visitors.

***The following articles are all from the National Ag Safety Database**

Animal Handling Safety

Eric Hallman, Darcy M. Demmin
Cornell Agricultural Health and Safety Program

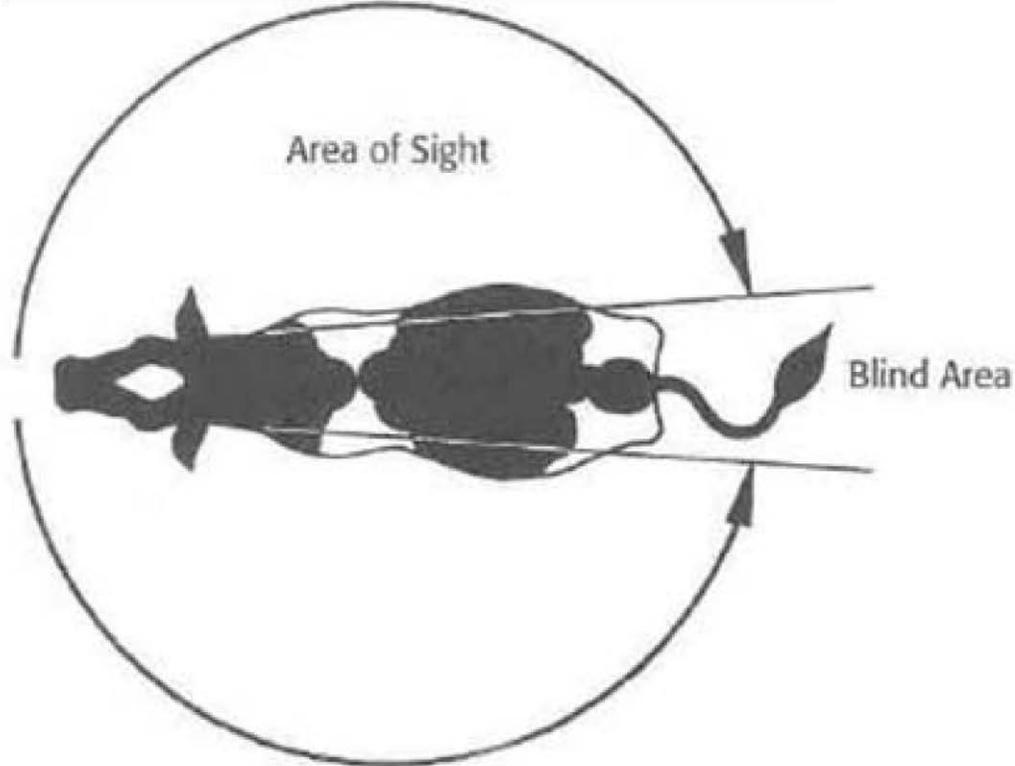
Animals are handled daily on nearly half of New York farms. In the Northeast, animal handling mishaps rank second in reported farm accidents. Every year at least one New York farmer dies as a direct result of a confrontation with a farm animal. An understanding of animal behavior is essential to preventing these accidents. Handlers must be aware of how animals react to different situations and know how to avoid or control potentially dangerous predicaments.

Animal Characteristics

Smell, Hearing, Sight

Most livestock rely heavily on their senses of smell, hearing, and to a lesser extent, sight. The sense of smell is particularly important to animals, and they will often react to odors that people cannot detect. Cattle may be lured by the smell of freshly mown hay, or a bull may become aggressive if he detects a cow in heat. Odors can trigger defensive reactions in livestock, especially females with newborns. Animals have extremely sensitive hearing. They hear high-pitched sounds better than humans and loud high-pitched noises often frighten or excite them.

Cattle and sheep see objects in black and white. Cattle have a panoramic field of vision, which means they can see everything around them except what is directly behind their hindquarters. If approached from the rear, they may be startled. Cattle have limited depth perception and judge distance poorly. Shadows may appear as holes, so they sometimes balk at sharp contrasts in light. Chute and alley walls should have flat surfaces to minimize this reaction. Diffuse lighting, which reduces bright spots and shadows, helps quiet animals. Livestock move more comfortably from dark to light areas than the reverse.



Hazards and Precautions

Physical Injuries

There are four common types of animal handling injuries:

- Animal steps on handler
- Animal slips and falls on handler
- Animal pins or squeezes handler against a barrier
- Animal kicks handler

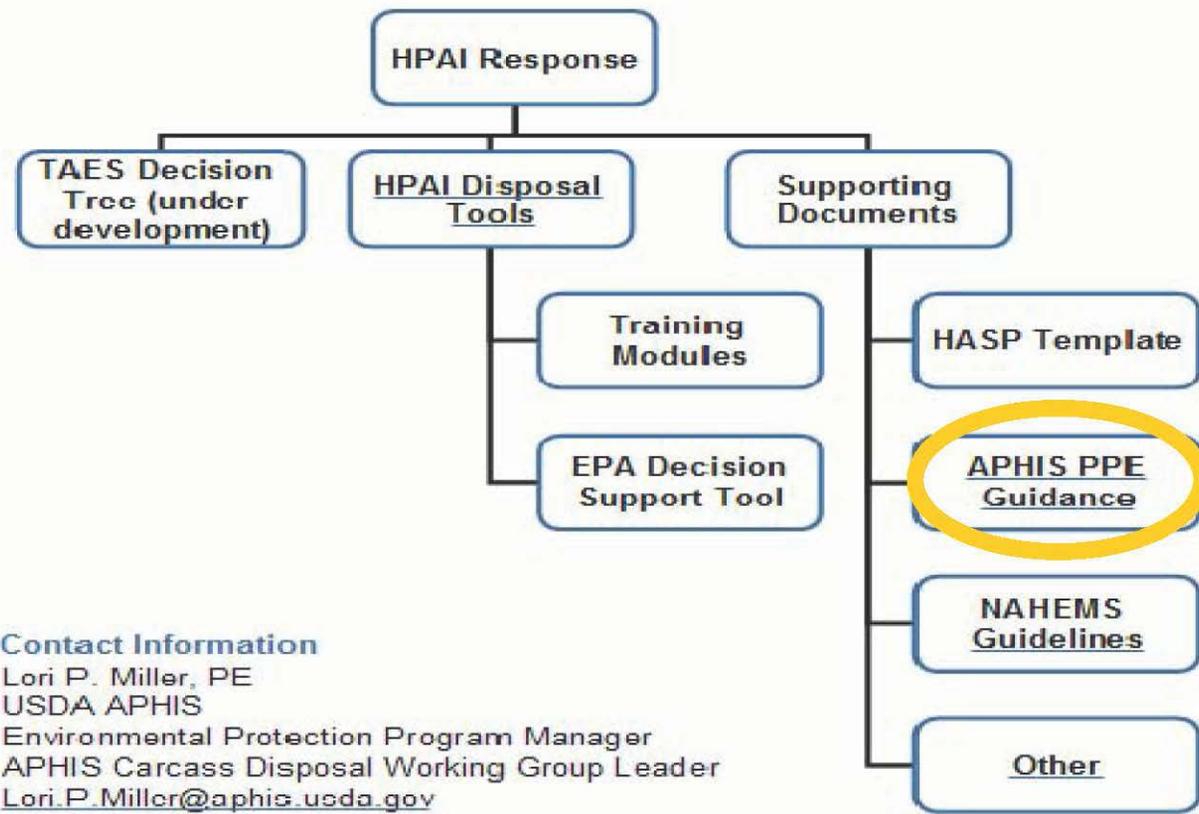
By employing practical experience and adhering to a few general rules, handlers can prevent most accidents and injuries.

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APHIS Employee Protection Guidance

**United States Department of Agriculture
Marketing and Regulatory Programs
Animal and Plant Health Inspection Service
Directive APHIS 6800.1 5/10/06**

ENSURING THE PROTECTION OF EMPLOYEES INVOLVED IN HIGHLY PATHOGENIC AVIAN INFLUENZA CONTROL AND ERADICATION ACTIVITIES

1. PURPOSE

This Directive specifies APHIS policy to ensure the safety of employees engaged in highly pathogenic avian influenza (HPAI) control and eradication activities. The policy is based on the degree of risk known to be associated with various levels and types of exposures to HPAI viruses and should be considered complementary to avian disease control and eradication strategies as determined by State government, industry, or the United States Department of Agriculture (USDA).

GUIDANCE FOR PROTECTING POULTRY WORKERS AT RISK

The following summarizes recommendations for protecting at-risk workers developed by the Centers for Disease Control and Prevention (CDC), the World Health Organization, and the Occupational Safety and Health Administration. Employees involved in HPAI control and eradication activities must take these precautions.

1. All persons who have been in contact with poultry, their feces or respiratory secretions, or contact with potentially contaminated surfaces must wash their hands frequently. Hand hygiene also must be performed immediately after gloves are removed and must consist of washing with soap and water for at least 15-20 seconds or using other standard hand disinfection procedures as specified by State government, industry, or United States Department of Agriculture (USDA) outbreak-response guidelines.
2. All workers involved in the culling, transport, or disposal of HPAI virus-infected poultry...



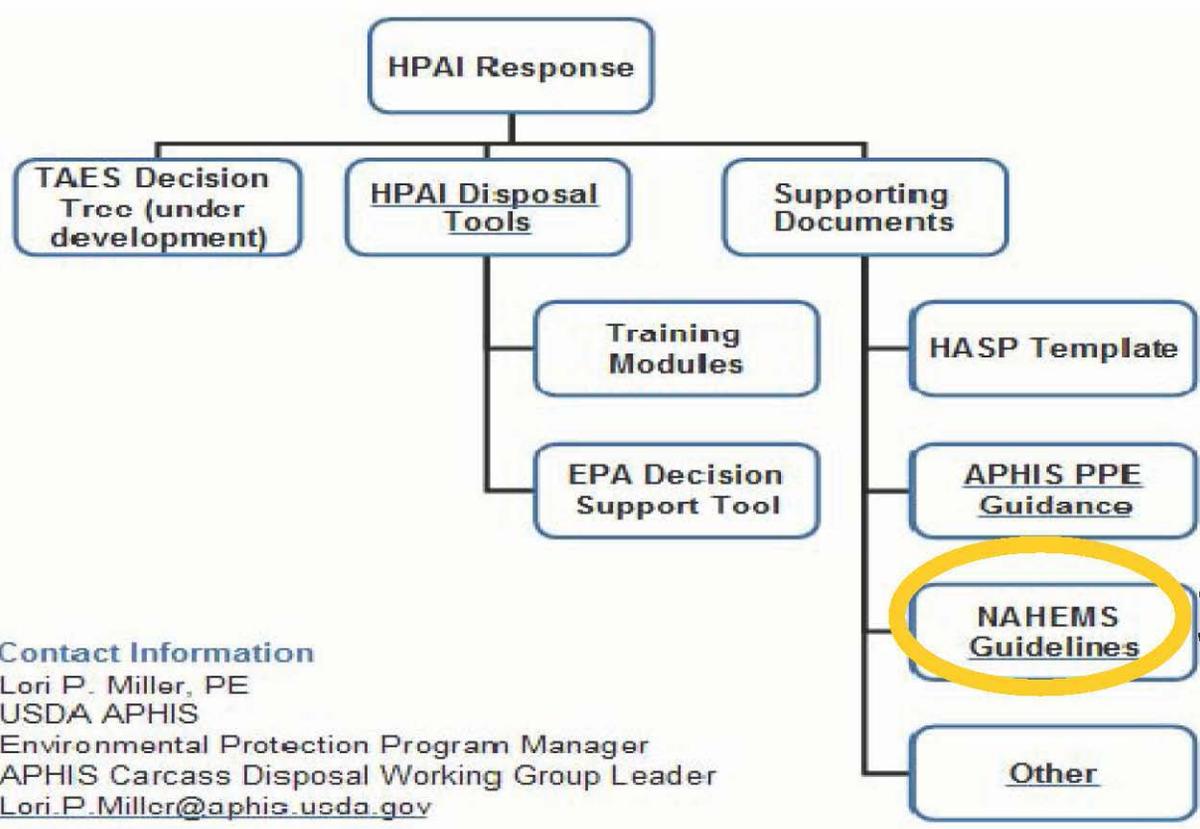
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United States Department of Agriculture

Animal and Plant Health Inspection Service

Management Response
Disease
Infectious
Prevention
Response
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Veterinary Services - Emergency Management National Animal Health Emergency Management System (NAHEMS) Guidelines



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Links

- [Register](#)
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- [Suggestions](#)
- [EMRS homepage](#)

The National Animal Health Emergency Management System (NAHEMS) is an integrated system for dealing with animal health incidents in the United States, such as the incursion of a foreign animal disease or a natural disaster. It encompasses the four tenets of emergency management: prevention, preparedness, response, and recovery. One cornerstone of the NAHEMS is the response guidelines series. The NAHEMS Guidelines are designed for use by official response personnel in the event of a major animal health emergency. They provide information that may be integrated into the preparedness plans of other Federal, State and local agencies, Tribes, and additional groups involved in animal health emergency management activities. The guidelines are being reviewed and updated on an ongoing basis; comments and [suggestions](#) are welcome. Some of the documents posted here are drafts, while others are "final" versions of living documents that will be updated as often as necessary.

The NAHEMS Guidelines are for official use only. Access is restricted to persons involved in the

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United States Department of Agriculture

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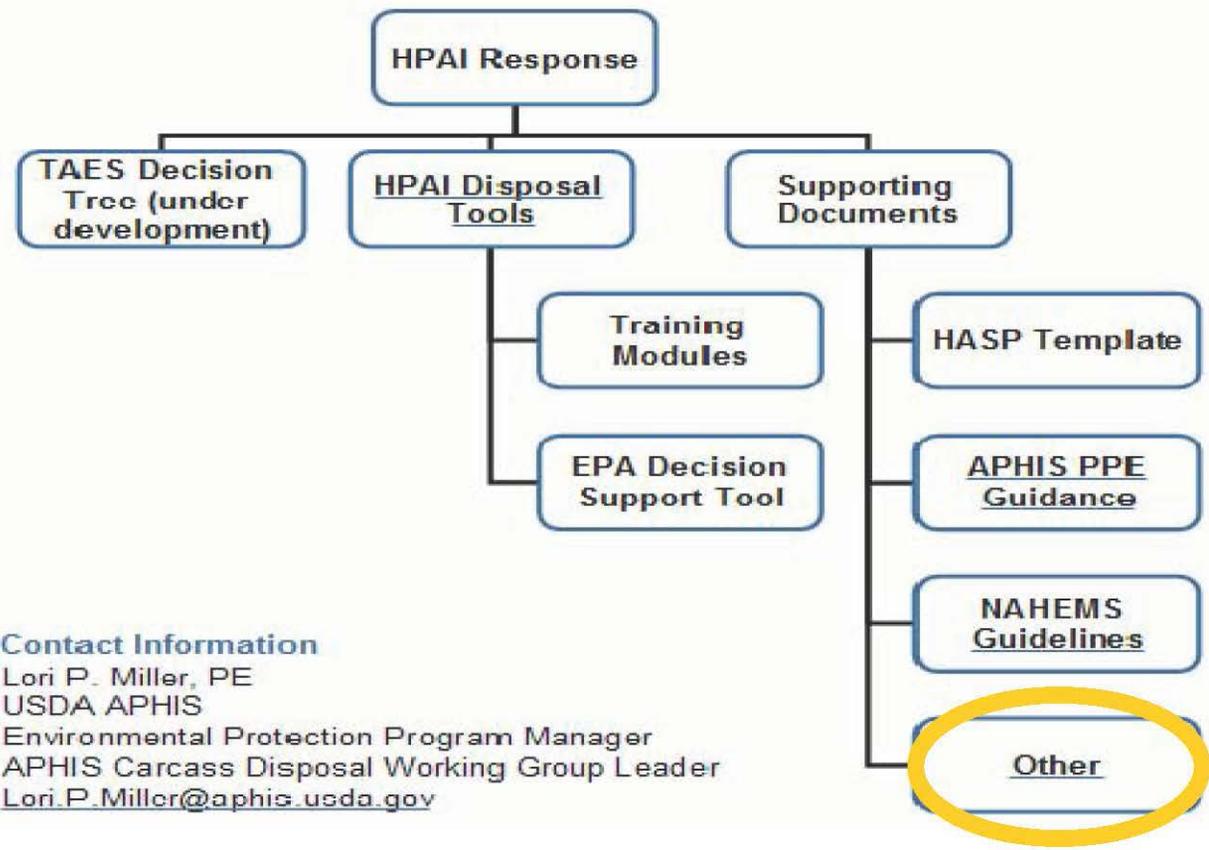
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Lori.P.Miller@aphis.usda.gov

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February 14, 2007



Questions

