

**STANDARD OPERATING  
PROCEDURES  
FOR  
MICHIGAN  
MASS CARCASS DISPOSAL**

**EFFECTIVE: SEPTEMBER 01, 2004**

# Standard Operating Procedures For Mass Carcass Disposal

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Memorandum of Understanding  
Between  
Michigan Department of Agriculture  
and  
Michigan Department of Environmental Quality  
and  
Michigan Department of Natural Resources

**Mass Carcass Disposal Plan**

This memorandum between the Michigan Department of Agriculture, hereinafter referred to as MDA, Michigan Department of Environmental Quality, hereinafter referred to as MDEQ and the Michigan Department of Natural Resources, hereinafter referred to as MDNR is entered into for the purpose of delineating the respective roles and responsibilities regarding mass carcass disposal in a major animal health emergency such as an incursion of a foreign animal disease, a natural disaster or a toxic substance.

Whereas, the MDA is statutorily charged with administering PA 466 of 1988, "Michigan Animal Industry Act," and PA 239 of 1982, "Bodies of Dead Animals Act" to ensure proper mass carcass disposal to protect the health, safety, and welfare of humans and animals.

Whereas, the MDEQ is statutorily charged with administering PA 451 of 1994, the Natural Resources and Environmental Protection Act (NREPA) to ensure the protection of public health and the environment by ensuring proper management of solid and hazardous waste, discharges to surface and groundwater, and emissions to air.

Whereas, the MDNR is statutorily charged with administering PA 451 of 1994, the NREPA to ensure conservation, protection, and management of the States natural resources.

In the event of a massive loss of livestock, poultry, or wildlife which occurs as a result of a natural disaster, disease outbreak, or toxic substance the Governor may elect to declare a State of Disaster or State of Emergency.

The MDA, MDEQ, and the MDNR agree to exercise their respective roles and responsibilities, as specified herein, for the purpose of protecting the animal and human health, water, air, and other natural resources of the State from pollution, impairment or destruction while maintaining a viable agriculture industry.

APPROVED:

\_\_\_\_\_  
Dan Wyant, Director  
Department of Agriculture

Date: \_\_\_\_\_

APPROVED:

\_\_\_\_\_  
Steven E. Chester, Director  
Department of Environmental Quality

Date: \_\_\_\_\_

APPROVED:

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Rebecca Humphries, Director  
Department of Natural Resources

Date: \_\_\_\_\_

## **OPERATIONS GUIDELINES**

### Introduction

The general principals provided in these Guidelines are intended to serve as a basis for making sound decisions. However, deviation from these Guidelines may be permissible, if necessary, to address a given situation effectively. Likewise, additional consideration might come into play given specific circumstances.

The Bodies of Dead Animals Act (BODA), Public Act 239 of 1982, regulates the disposal of dead animals. The Governor may implement these Guidelines when the number of dead animals exceeds the capability of disposing of the dead animals in compliance with BODA; and pursuant to a Declaration of a State of Emergency or State of Disaster.

## **AUTHORIZATION**

### A. Animal Industry Act - PA 466 of 1988, as amended

1. The MDA Director has authority to issue a quarantine on animals, structures, premises or any area of the state, including the entire state if necessary, for the purpose of controlling or preventing the spread of a known or suspected infectious, contagious, or toxicologic disease.
2. The MDA Director has authority to order depopulation of animals and direct the disposal of carcasses.
3. The MDA Director has authority to restrict movement of animals.
4. If the MDA Director determines that an extraordinary emergency exists, the Governor shall be notified with recommend procedures necessary to eliminate the threat. The Governor may issue a proclamation declaring a state of emergency.

### B. Emergency Management Act - PA 390 of 1976, as amended (Only valid for 14 days)

1. Governor has authority to suspend a regulatory statute or rule.
2. Governor has authority to mobilize all state and local resources.
3. Governor has authority to commandeer or utilize private property (subject to compensation).
4. Governor has authority to compel evacuation.
5. Governor has authority to control ingress or egress in threatened area.
6. Governor has authority to direct all other necessary and appropriate actions.
7. Provides personal injury and property damage liability protection for volunteers.
8. Requires legislative action to extend disaster declaration beyond 14 days.

### C. Bodies of Dead Animals Act - PA 239 of 1982, as amended

1. Provides for acceptable means of animal carcass disposal.
2. Limits number and weight of carcasses per acre and establishes burial depth.
3. Allows for an exemption to the total number of individual or common graves per acre or the total weight of carcasses in individual or common graves with concurrence from the Director of the MDEQ.

D. Michigan Military Act - PA 150 of 1967

1. Governor has authority to mobilize the Michigan National guard.

E. Natural Resources and Environmental Protection Act - PA 451 of 1994  
Potentially applicable provisions include, but are not limited to:

1. Part 5 - Section 504, Department of Natural Resources Rules for Protection of Lands and Property
2. Part 401 - Wildlife Conservation
3. Part 55 - Air Pollution Control
4. Part 31 - Water Resources Protection
5. Part 111 – Hazardous Waste Management
6. Part 115 – Solid Waste Management

## **ROLES & RESPONSIBILITIES**

### **A. Michigan Department of Agriculture**

The Michigan Department of Agriculture has the responsibility to protect the human food chain and the livestock and aquaculture industries of the state through prevention, control and eradication of infectious, contagious, or toxicologic diseases of livestock and other animals and to regulate the proper disposal of dead animals.

### **B. Michigan Department of Environmental Quality**

The Michigan Department of Environmental Quality protects public health and the environment in Michigan through enforcement of certain provisions through Natural Resources Environmental Protection Act (NREPA, PA 451 of 1994 ensuring the proper treatment, storage, and disposal of hazardous and solid waste, and the proper prevention and control of discharges to surface and groundwaters, and emissions to the air.

### **C. Michigan Department of Natural Resources**

The Michigan Department of Natural Resources has the responsibility to protect the natural resources for current and future generations. This includes protection of fish and wildlife resources from health threats, as well as preservation of public lands for their intended uses, and from significant degradation.

## **ANIMAL CARCASS DISPOSAL EMERGENCY DECISION TREE**

### **Natural Disasters:**

In the event of death, or injury leading to destruction of animals due to natural disasters, (ex. flood, fire, tornado, heat prostration, etc.) the choice of disposal for the carcasses only need take into consideration the environmental impact of decomposition of carcasses. Disease agents or toxic substances will not routinely be involved or require consideration as an aftermath of a natural disaster. The first choice would be to bury on the premises where the disaster occurred if commercial disposal is not available, with other options secondarily considered.

### **Toxic Substances or Toxic Residue Disasters:**

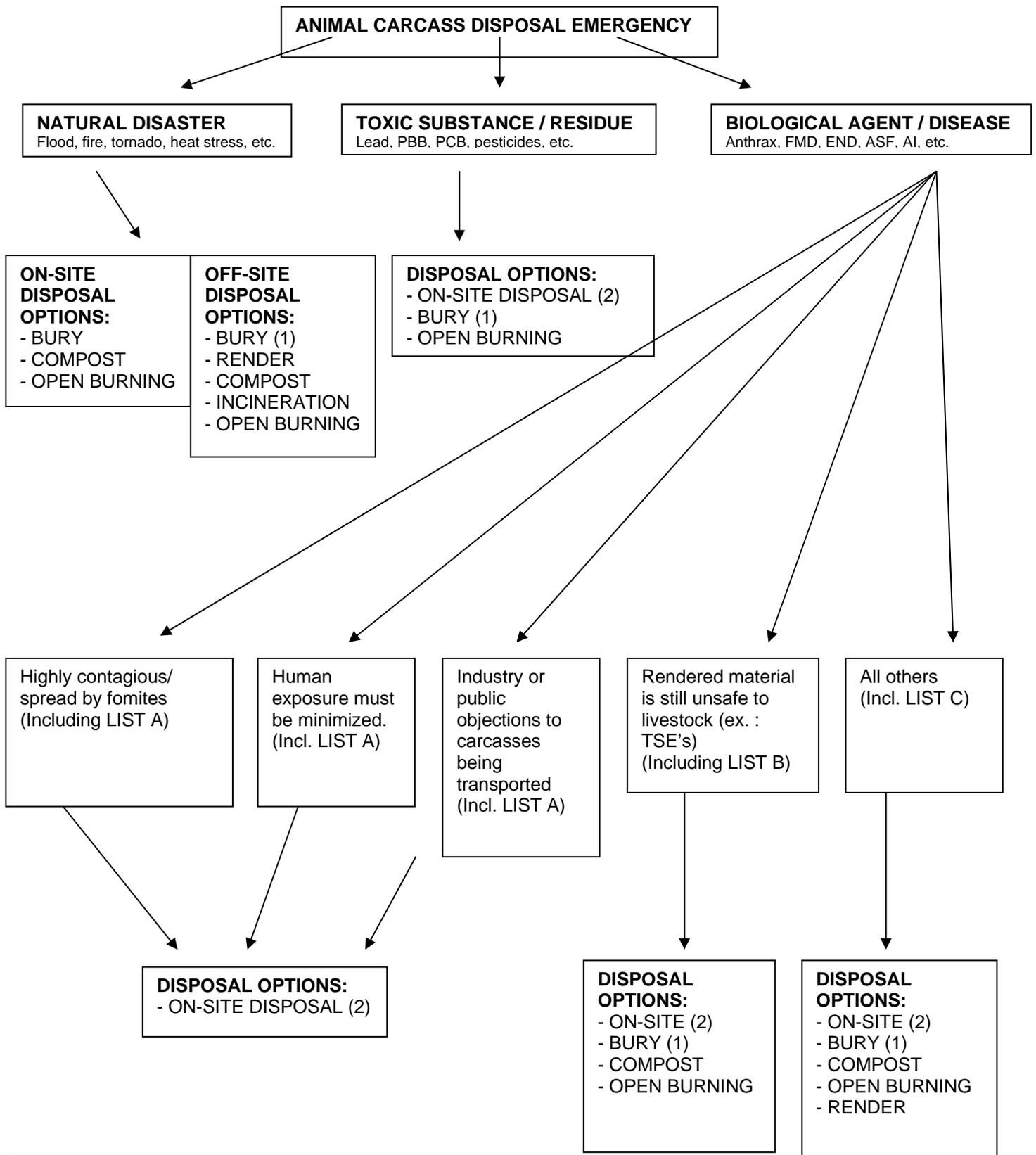
When a disaster occurs caused by a toxic substance resulting in toxic residue in the animal, the following must be considered in selecting appropriate and safe disposal: toxicity of breakdown products of the toxic material in various disposal scenarios, environmental impact of the products of carcass decomposition, potential for primary toxins or toxic breakdown products entering the water table if burial is used, hazardous material burial site availability and applicability, and toxin destruction through incineration of the carcasses.

### **Biological Agent or Disease Disasters:**

If mass carcass disposal is necessary due to a bacterial, viral, prion, or other disease agent, the choice of disposal method must take the following into account: biologic environmental impact of decomposition of carcasses, the possibility of the agent escaping from the burial site, the soil type and ground water level on the disaster premises, the risk that the agent will be disseminated if the carcasses are moved away from the affected premises, and the public perception of burial on the farm. If possible, considering the factors above, carcasses should be buried on the affected premises to minimize the risk of disseminating the disease agent to other locations.

Disposal decisions where biological agents are involved should be made in accordance with the following questions:

1. *Is the pathogen of sufficient contagiousness and/or infectivity that movement from the site of disease occurrence (the diseased/disaster premises) is likely to result in disease spread, or is of high public health concern? If **yes**, **on-site disposal by burial or open burning is preferred**. See LIST A for specific diseases in this category. If **no**, continue to question 2.*
2. *Is rendering effective in denaturing or destroying the pathogen? If **yes**, **render**. If **no**, the affected animals should be disposed of by other means, either on the diseased/disaster premises or at an off-site location.*



- (1) Private property or Landfill
- (2) Bury
- (3) Open Burning

**LIST A**

**(Bury, incinerate or otherwise dispose on the diseased/disaster premises)**

**Foot and Mouth Disease (FMD)**

**African Swine Fever (ASF)**

**Anthrax**

**Hog Cholera**

**Rift Valley Fever**

Animals infected with these diseases should be buried on the premises if at all possible. Movement to another site will incur risk of spreading of the pathogen while en-route to a second facility and may cause new outbreaks.

**LIST B**

(Rendering not acceptable/not generally recommended)

**African Swine Fever (ASF)**  
**Avian Salmonellosis**  
**Branchionephritis of Eels**  
**Chusan Disease**  
**Egg Drop Syndrome**  
**Epizootic Lymphangitis**  
**Foot and Mouth Disease (FMD)**  
**Getah**  
**Goat Pox**  
**Goose Hepatitis**  
**Hemorrhagic Septicemia (Asiatic)**  
**Hog Cholera**  
**Hydropericardium Syndrome (Angara)**  
**Israel Turkey Meningo Encephalitis**  
**Jembrana Disease**  
**Lumpy Skin Disease**  
**Melioidosis**  
**Nasal Schistosomiasis**  
**Nomi Disease**  
**Peste des Petits Ruminants**  
**Pike Fly Rhabdovirus Disease**  
**Porcine Epidemic Diarrhea**  
**Rift Valley Fever**  
**Rinderpest**  
**Sheep Pox**  
**Spring Viremia of Carp**  
**Swine Vesicular Disease**  
**Swine Blue Eye Disease**  
**Teschen Disease**  
**Vesicular Exanthema (VE)**  
**Vesicular Stomatitis (VS)**  
**Viral Hemorrhagic Disease of Rabbits**  
**Viral Turkey Rhinotracheitis**  
**Viral Hemorrhagic Septicemia of Trout**  
**Wesselsbron**

## **LIST B**

**(Rendering not acceptable/not generally recommended)**

**Chronic Wasting Disease (CWD)\***  
**Bovine Spongiform Encephalopathy (BSE)\***  
**Scrapie\***  
**Transmissible Mink Encephalopathy (TME)\***  
**Transmissible Feline Encephalopathy\***  
**Other TSE's\* (Transmissible Spongiform Encephalopathies)**

**Hog Cholera\*\***  
**Vesicular Stomatitis (VS)\*\***  
**Exotic Newcastle Disease (END)\*\***  
**West Nile Virus (WNV)\*\***  
**Brucellosis (Melitensis)\*\***  
**Avian Influenza (high path.) (AI)\*\***

\*Incineration or burial is preferred but if numbers are small, alkaline digestion is acceptable. The preferred method of disposal for TSE-infected material is high temperature incineration.

\*\*Animals infected with these diseases should be buried on the premises if possible. However, if proper precautions are taken in type of transport used and control at the receiving point, the risk of transmission would not be as great as for LIST A diseases. Animals with these diseases have been moved in the past without known transmission of the infectious agents to live animals. With hog cholera, swine from many farms have been rendered and the meat and bone meal used for feed purposes without known transmission. Strict control and oversight would be necessary to be sure that materials produced through rendering did not become contaminated by material from the input end of the operation.

**LIST C**  
**(Rendering is acceptable)**

**African Horse Sickness**  
**African Trypanosomiasis**  
**Akabane**  
**Babesiosis**  
**Besnoitiosis**  
**Bluetongue**  
**Borna**  
**Bovine Petechial Fever**  
**Bovine Tuberculosis**  
**Contagious Agalactia**  
**Contagious Bovine Pleuropneumonia**  
**Contagious Equine Metritis (CEM)**  
**Dourine - horses**  
**East Coast Fever (Corridor Disease)**  
**Elaphostrongylosis**  
**Ephemeral Fever**  
**Equine Encephalitis (Eastern (EEE), Western (WEE), Venezuelan (VEE))**  
**Glanders**  
**Heartwater**  
**Ibaraki**  
**Japanese Encephalitis**  
**Louping Ill**  
**Nairobi Sheep Disease**  
**Parafilariasis**  
**Schistosomiasis**  
**Screwworm Myiasis**  
**Surra**  
**Sweating Sickness**  
**Theileriasis**  
**Tick-Borne Fever**

## **ENVIRONMENTAL CHECKLIST**

The environmental checklist is intended as a field guide to help quickly identify environmental issues associated with the following on-site carcass disposal methods:

- Burial
- Composting
- Open Burning

Use of this checklist will help to integrate environmental concerns into the planning and decision making process. Furthermore, it will assist in identifying potentially negative consequences that then can be avoided, minimized, rectified, reduced, or compensated.

### **Environmental Resource Issues**

Several environmental resource issues have been highlighted in this checklist to ensure they are considered in evaluating the preferred method or methods of disposal. They are:

- Surface water, including wetlands
- Groundwater, including soils
- Air quality, including odor
- Wildlife, including endangered species
- Public health/worker safety
- Vegetation
- Solid waste
- Cultural resources/historical preservation
- Climate
- Utilities
- Sensitive Sites
- Monitoring and maintenance of a disposal site

## **DISPOSAL PROCEDURES**

### On-Site Disposal:

In most situations, the most expeditious method of disposal is that of burial at a single on-premises site. Compared to other disposal methods, burial is simpler, more expeditious and economical, and, depending on the seasonal high water table level and soil conditions, less likely to cause adverse environmental effects. On-site burial also minimizes biosecurity concerns involved in moving contaminated carcasses, animal products, and other materials off the infected or presumptive positive premises. Considerations in planning for on-site disposal include:

### **Burial**

- The suitability of potential sites for burial or incineration near the site where the animals are located.
- The number and species of carcasses and the amount and type of other material in need of disposal.
- The amount and size of rocks and the type of soil in the potential disposal site.
- Roads or open areas that can provide large trucks and other vehicles access to the disposal site.
- The seasonal high water table at the proposed site.
- The distance between the proposed site and surface water bodies and wells.
- The location of underground and overhead utility structures (e.g., septic tanks and equipment for water, gas, electricity, telephones, and sewage).
- The intended uses of the site after disposal activities are completed.
- The digging of the burial pit should begin as soon as possible after confirmation of a disaster.
- The advice of a soil scientist or geologist as to site feasibility should be sought early in the planning stage.
- The accessibility of pit-digging and carcass/material delivery equipment to the site.

- The amount of surface area needed. Sufficient surface area should be allowed for the burial site and for surrounding work areas.
- The distance from the proposed site to spaces used by humans (e.g., houses, roads, or other areas of public view).
- Prevailing winds (important in odor control and management).
- Avoidance of site disturbance and/or erosion. The use of flood plains or land that slopes at an angle greater than 5 percent should be avoided.
- Space requirements for temporary storage of backlog accumulations of carcasses awaiting disposal.
- Soil conditions, including the need for stable soils capable of withstanding the weight of equipment used to construct and fill pits.
- The use of fences should be sufficient to keep out domestic animals and wildlife, while the pit is being prepared and filled and after it is capped and closed. As a rule, fences should be maintained for at least a year after carcass disposal.
- Environmental factors such as the location of the site in relation to pit drainage and to waterways, reservoirs, wells, and water table levels. Diversions should be built as needed to prevent surface water runoff from entering the pit. Similar diversions should be constructed to prevent liquid from leaving the burial site.

## **Composting**

The purpose of the operation is the safe disposal of the carcasses, not the production of compost. Compost piles should be designed to provide adequate moisture, porosity and moderately excess carbon to nitrogen ratios. Diversions should be built as needed to prevent surface water runoff from entering the compost site. Similar diversions should be constructed to prevent liquid from leaving the compost site.

- The disposition of finished compost may be directly applied to soils following generally accepted agricultural and management practices.

## **Open Burning**

Open burning should be used only when burial is not feasible.

Selection of a Burn Site - The burn site should be selected with care. It should be located on a generally level area, away from public view.

Selection of a site for burning requires consideration of many factors, including the following:

- **Accessibility.** The site should be readily accessible to heavy vehicles hauling carcasses and materials and other equipment used to build the fire bed and maintain the fire.
- **Aesthetics.** The prevailing wind should be considered to minimize smoke and objectionable odors from blowing toward farm buildings, residences, or across public roads.
- **Protection of adjacent structures.** The fire should be kept well away from houses and other buildings and hay, straw, or feed stacks. It also should be kept away from roads and utilities (e.g., overhead electric and telephone cables and underground utilities).
- **Protection of adjacent vegetated areas.** The burn site should be away from hayfields, woodlots, vegetation corridors and other areas with combustible vegetation.

#### Off-Site Disposal:

#### **Burial**

Off-site burial may occur when on-site burial is not an option. The site selection and management procedures to follow are the same as for on-site burial.

#### **Composting**

Composting off-site may occur provided the procedures used are the same as for on-site composting.

#### **Rendering**

Only rendering facilities that meet the minimum standards for elimination of the disease agent should be approved by the State Veterinarian or designee.

Most rendered material is considered safe and valuable, as it may be reused (e.g., as animal feed or protein). However, any decision to use the rendered material commercially must take public concerns (e.g., nuisance odors), perceptions, and possible disease transmission into account.

#### **Incineration**

The incinerators in Michigan are of limited number and supply. Due to the cost of incineration this disposal method should be used for TSE infected material.

## **Commercial Landfills**

In some cases, the use of commercial landfills to dispose of large numbers of carcasses may be an option. There may be circumstances where it is more practical to landfill carcasses; such as lack of available acreage, high water table, or other environmental concerns.

## **BIOSECURITY PROCEDURES**

The necessity for personal protective equipment and the extent of biosecurity precautions vary greatly depending on the types of operations and sites visited, and the types of diseases and pathogens encountered at a site.

Establish a clean area and path around where your vehicle is parked. Take all necessary supplies with you on your first trip. If you return to your vehicle for supplies, additional cleaning and disinfecting will be required each time.

### Entry Biosecurity

- Parking
- Exit Vehicle
- Prepare disinfectant solution
- Put on boots and coveralls/gloves/etc.
- Obtain necessary equipment
- Enter farm

Remember before leaving the site, remove all used disposable items and trash, and seal in a trash bag. Leave on farm in a place designated by the owner, or place in the designated "dirty" area of your vehicle and dispose of later. Reusable items should be cleaned and disinfected appropriately.

### Exit Biosecurity

- Return to vehicle
- Clean and disinfect equipment/boots
- Remove boots and coveralls
- Store equipment
- Disposal of contaminated materials
- Dispose of disinfectant
- Maintain clean vs. dirty areas of vehicle

Practice first-rate personal hygiene between site visits. Remember that disease-causing organisms can be transmitted on your hair, under your fingernails, or even in your respiratory tract!

Always be aware of the potential for transmission of disease whenever approaching a farm. Remember that disease-causing agents can be brought to the farm or carried away with **YOU**. Animals you encounter need not be clinically ill to carry and transmit disease.

Always err on the side of being too careful. If an outbreak occurs, and you did not observe proper precautions, you may be blamed, even if it is not your fault. If the farmer/owner thinks it is unnecessary for you to observe biosecurity measures, **OBSERVE THEM ANYWAY!!**

## RESOURCES

### A. Federal

- USDA, Animal and Plant Health Inspection Services - East Lansing, MI (517) 324-5290
- USDA, Animal and Plant Health Inspection Services - Wildlife Services Okemos, MI (517) 336-1928
- USDA, National Resources Conservation Services - East Lansing, MI (517) 324-5270

### B. State

- MDA, Animal Industry Division - Lansing, MI (517) 373-1077
- MDEQ, Waste and Hazardous Materials Division - Lansing, MI (517) 373-2730
- MDNR, Wildlife Division - Lansing, MI (517) 373-1263

### C. Local Agencies

- USDA Natural Resources Conservation Service Michigan Field Offices

Location	Phone
ADRIAN	(517) 263-7400
ALLEGAN	(269) 673-8903
ALPENA	(989) 356-3596
ANN ARBOR	(734) 761-6722
BAD AXE	(989) 269-9540
BARAGA	(906) 353-8225
BAY CITY	(989) 686-0430
BEAR LAKE	(231) 889-9666
BELLAIRE	(231) 533-8542
BERRIEN SPRINGS	(616) 471-9111
BIG RAPIDS	(231) 796-2650
CADILLAC	(231) 775-7681
CARO	(989) 673-8174
CASSOPOLIS	(269) 445-8643
CENTREVILLE	(269) 467-6336
CHARLOTTE	(517) 543-1539
COLDWATER	(517) 278-2725
FLINT	(810) 230-8766
FREMONT	(231) 924-2060
GAYLORD	(989) 732-6526
GLADSTONE	(906) 428-4076

GLADWIN	(989) 426-9621
GRAND HAVEN	(616) 842-5869
GRAND RAPIDS	(616) 942-4111
HASTINGS	(616) 948-8038
HOWELL	(517) 548-1553
IONIA	(616) 527-2620
ITHACA	(989) 875-3401
JACKSON	(517) 784-2800
JONESVILLE	(517) 849-9890
KIMBALL	(810) 984-3001
KINGSFORD	(906) 774-1550
LAPEER	(810) 984-3001
MARQUETTE	(906) 226-9460
MARSHALL	(269) 781-4263
MASON	(517) 676-5543
MIDLAND	(989) 835-1921
MONROE	(734) 241-7755
MOUNT PLEASANT	(989) 772-9152
ONAWAY	(989) 733-8323
OWOSSO	(989) 723-8263
PAW PAW	(269) 657-4220
PETOSKEY	(231) 347-5255

PORTAGE	(269) 327-0696
REED CITY	(231) 832-5341
SAGINAW	(989) 781-4070
SANDUSKY	(810) 648-2998
SAULT STE MARIE	(906) 632-9611
SCOTTVILLE	(231) 757-3708
SHELBY	(231) 861-5600
ST JOHNS	(989) 224-3720
STANDISH	(989) 846-4565
STANTON	(989) 831-4606
STEPHENSON	(906) 753-2513
TRAVERSE CITY	(231) 941-0951
WEST BRANCH	(989) 345-5473

## **APPENDIXES**

State Agency Emergency Management Contact List (Attachment A)

Reportable Disease List (Attachment B)

List of Landfills (Attachment C)