CAL/EPA

Emergency Animal Disease

Regulatory Guidance for Disposal and Decontamination

October 20, 2004

Developed for the Interagency Foreign Animal Disease Working Group, by the Emergency Animal Disease Removal Working Group, and Emergency Response Management Committee (ERMAC)

Lead: Don Johnson (California Environmental Protection Agency)

Members:
Dr. Jim Carlisle (Office of Environmental Health Hazard Assessment)
Bob Holmes (Integrated Waste Management Board)
Dr. Michelle Jay (Department of Health Services)
John Menke (State Water Resources Control Board)
Steven Monk (California Environmental Protection Agency)
Bill Ryan (Department of Toxic Substances Control)
Walt Shannon (State Water Resources Control Board)
Nicholas Surjan (Department of Pesticide Regulation)
Dr. Annette Whiteford (California Department of Food and Agriculture)
Gary Zimmerman (Air Resources Board)

Table of Contents:

Introduction:

The term "emergency animal disease" (EAD), as used in this document, refers to a number of biological threats to poultry, livestock, and wildlife in the United States. Though their effects differ somewhat, each disease presents substantial risk to animal or human health, the environment, the economy, and society overall. An effective response to a large-scale EAD outbreak requires the combined resources of various agencies and the ability to rapidly deliver appropriate support.

Effective eradication of a particular EAD occurrence requires three key elements: rapid identification, geographical containment, and “removal” of affected animals – each element presents significant challenges for agencies. The California Department of Food and Agriculture (CDFA) is the primary State agency responsible for developing emergency animal disease identification, containment, and removal procedures. This document focuses on aspects of “removal” involving environmental oversight expertise.

The removal process involves the humane euthanasia and disposal of affected and exposed susceptible animals and may include removal of manure, bedding, feed, structures, etc, and the decontamination of surrounding areas. Removal is necessary to eradicate the disease and is a prerequisite to recovery. Disposing of large numbers of animal carcasses exposed to a devastating animal disease will immediately overwhelm routine disposal channels. Alternative methods of disposal, such as burning or burying, could create impacts on air and water quality. Chemicals used for decontamination of affected areas have environmental concerns.

This document anticipates the environmental and human health issues arising from the immediate disposal of a large number of animal carcasses. The primary focus is an animal disease outbreak, with a secondary recognition that emergencies can result from toxic exposure or a natural disaster. The document describes disposal options that can be rapidly implemented under most emergency conditions.

Scope and Use of this Document

This document is a partial guide to State of California regulatory programs that may, in the discharge of their respective responsibilities to protect human health and the environment, impact disposal and decontamination options in the event of an emergency animal disease (EAD outbreak. The information contained herein is intended to guide State and local officials responsible for supervising and/or conducting removal activities. It may serve, secondarily, as a resource for the public, especially those in the agricultural industry, involved in contingency planning for such an event. In either case, this document does not constitute an abrogation of any regulatory authority nor an endorsement , nor permitting of any otherwise prohibited activity. The document serves to prepare the reader for the issues and options encountered on a case-by-case basis should an EAD actually impact California.

This dynamic document will change over time; experience and periodic reviews will lead to revisions and improvements. Also, this document only attempts to focus on macro removal issues – whole or part carcass disposal and basic facilities and equipment decontamination. Removal issues certainly go beyond the initial scope of this document. Removal of bedding, feed, manure, stock ponds, etc. may occur during an EAD; the appropriate agency should be contacted if there is a question concerning removal of these materials.

Finally, this document complements other federal and State efforts to address EAD emergency response. In particular, this document augments the plan developed by the Office of Emergency Services and CDFA, titled “California Response to Foreign Animal Disease: A Multi-Agency, Statewide Plan for Response” and other documents, including CDFA’s “Local Planning Guide for Animal Disease Emergency Response,” and the United States Department of Agriculture’s “National Animal Health Emergency Management System Guidelines: Operational Guidelines: Disposal.” While this document augments other works, it is important to remember that California-specific laws must be followed when evaluating and mitigating environmental and human health risks from an EAD outbreak.

This document supports the statutorily established Standardized Emergency Management System (SEMS) implemented throughout California during state and local emergency response. The law is found in the Government Code, Section 8607; regulations governing SEMS became effective September 2, 1994. Since enactment, SEMS has proven to be an invaluable tool in responding to a variety of natural and man-caused disasters. Local government and state agencies can utilize SEMS in responding to EAD emergencies as well. SEMS provides the organizational structure, functional division of roles and responsibilities, support resources, and communication routes already utilized by local and state response agencies. It also provides an established conduit to federal resources if the emergency escalates to the federal level.

The Governor's Office of Emergency Services (OES) was a valuable partner in the preparation of this document and continues to support planning and response for EAD incidents. A reference copy of the OES brochure on SEMS is contained in the Appendices.

Development of a Removal Hierarchy

An early priority in any EAD outbreak is to develop a carcass disposal hierarchy. The hierarchy choices must protect public health, safeguard the environment, and ensure uncompromised disease control. The disposal cost, while important, is a lower hierarchy priority. This hierarchy cannot anticipate every circumstance. Disposal and decontamination choices are specific to each individual outbreak.

There are two key elements to consider when determining a removal hierarchy:

(1) The evaluation and choice of a disposal methodology, and
(2) The selection of a disposal site.

This section presents a brief evaluation of the various options for disposal and proposes a sequence in which that evaluation should occur to determine an appropriate removal hierarchy

DISPOSAL METHODS

The optimal disposal method varies according to circumstances. It is important to focus on the overall goal of the EAD response: to control, contain, and eradicate the disease. Some common disposal options and their potential shortcomings follow:

Burial
Burial has been a historical practice for animal disposal throughout the world. However, concerns about the contamination of groundwater have caused many states to ban the practice of burying animal carcasses. In California, a regional water quality control board (Regional Board) may still allow burial for disposal of routine mortality (deaths that are not associated with an infectious disease) and, under certain circumstances, for emergency animal disposal. Prior to burial of animal mortality, the owner or operator of the site where the animals are proposed for burial must submit a Report of Waste Discharge (ROWD) to the appropriate Regional Board. The Regional Board will then determine if burial is appropriate and issue Waste Discharge Requirements (WDRs) for the disposal. In the event of a declared emergency, the Regional Board may establish special burial conditions that, if followed, will allow the Regional Board waive the requirements to file a ROWD and obtain WDRs prior to the burial.

[See the agency-specific guidance pages of the State Water Resources Control Board and Regional Boards.]

Burning
Burning of animal carcasses is an effective, often expedient method of disposal that also destroys most pathogens. The benefits of burning include reduction in volume of the solid waste and reduction in the potential for groundwater pollution from the decomposing carcass.

However, burning produces air pollution. The burning of carcasses without emissions controls produces dense smoke and offensive odors that can create an illegal public nuisance and can result in significant public opposition if conducted near populated areas.

There are two basic methods used to burn carcasses — open burning and biological incineration.

Open Burning
An exemption to the California Health and Safety Code permits open burning for the purpose of disease abatement and prevention (Health and Safety Code, Section 41801(f)). Any public officer, including the Governor, under his/her authority for the declaration of emergencies, may permit such fires. There is no requirement for an air pollution control district permit or for the burning to be conducted on a permissive burn day, but burning cannot cause a public nuisance (Health and Safety Code, Section 41700).

Airborne contaminants resulting from the open burning of animal carcasses include those common to other sources of open burning such as large bonfires, wildfires, and agricultural burning. The smoke from these fires is extremely high in particulate matter and produces offensive odors. Soot (fine particulate matter) is the primary air pollutant of concern. Hydrocarbons, carbon monoxide, oxides of nitrogen, and sulfur dioxide are also emitted.

Open burning of animal mortality can be conducted at the site of the animal facility or at an alternative site; pyres may be above ground or in trenches. The use of accelerants such as diesel fuel, or auxiliary fuels such as wood and straw is required to achieve the combustion temperatures necessary for the complete destruction of animal carcasses. Specific procedures used to burn large numbers of animal carcasses are described in the U.S. Department of Agriculture's Animal and Plant Health Inspection Service – Veterinary Services (APHIS VS) emergency disease guidelines.

The efficiency and effectiveness of open burning can be significantly enhanced by using an *air curtain destructor* (ACD). An ACD is a mechanical device that forcefully projects a high volume curtain of air into a pit or trench while open burning is conducted. The air curtain increases combustion efficiency and reduces visible emissions and odors. ACDs are expensive, require specially trained operators, and are not presently available in California. There are only a few manufacturers of ACDs in the United States. For further, information visit ACD manufacturers' Web sites at http://www.airburners.com and http://conceptproducts.com.

Burning results in the destruction of most pathogens, a significant reduction in the volume of solid wastes, and minimization of potential impacts on water quality. There is no absolute assurance that open burning prevents further spread of all pathogens. Burning will leave residues that must be disposed of by composting, burying, or

transporting to a landfill.

Biological Incineration
High temperature (biological) incineration is a method of thermal destruction of both the carcass and pathogens. Biological incinerators operate at extremely high temperatures — in excess of 2000^{o}F in some cases — to convert volatile gases, vapors, and particulate matter to carbon dioxide, water, and ash. In a properly designed and operated biological incinerator, the combustible portion of the carcass is burned, producing a residue free of pathogens. An afterburner on the incinerator exhaust stack is extremely effective in eliminating residual odorous compounds. A properly designed and operated biological incinerator with an afterburner produces a stack gas virtually free of odors and particulate matter emissions.

There currently are no large biological incinerators in California. The incineration process is expensive, and access to an incineration facility with the capacity required to accommodate large animal carcasses in mass quantities is currently not possible. Other high temperature combustion devices, such as cement kilns and coke calciners, are not designed for carcass incineration.

Biological incinerators are “fixed-facilities” that do not fall under the exemption for open burning and are subject to the rules, regulations, and permitting requirements of the local air pollution control district.

[See the agency-specific guidance pages of the Air Resources Board.]

Composting
Composting is the aerobic decomposition and stabilization of organic matter under conditions that allow development of thermophilic temperatures as a result of biologically produced heat. It is a natural process, enhanced and accelerated by the mixing of organic waste with other ingredients in a prescribed manner for optimum microbial growth. Composting transforms a waste product (manure and dead animals) into a useful soil amendment.

During the past three decades, considerable interest has developed in composting as a method of waste disposal. The process has been widely used in Europe and Japan but is not as prevalent in the United States. The heat developed in the composting process kills most eggs of parasites and also kills many bacteria. The lethal temperatures usually extend to within 4 to 8 inches of the surface of the compost.

Composting can be difficult to manage and can result in objectionable odors. Supervision of the composting process by a knowledgeable person is necessary to ensure complete decomposition and a stable composted material. If the material being composed is not properly turned, the destruction of pathogens, especially heat resistant bacteria and spore-formers, cannot be assured. Flies, mosquitoes, rats, wildlife, and other disease vectors attracted to compost can spread disease. Large bones and hides will not compost readily and serve as deterrents to the composting process. While

composting is used for the disposal of certain forms of solid waste, the process has severe limitations for disposing of large numbers of animals.

Currently California regulations prohibit the composting of mammalian flesh, organs, unprocessed hide, blood, bone and marrow, absent a declaration of emergency (Title 14, California Code of Regulations, Section 17852(i).)

[See the agency-specific guidance pages of the Integrated Waste Management Board.]

Solid Waste Landfills

Depositing dead animals in the local landfill is a practice used by some producers for many years. This option is commonly used for disposal of a small numbers of large animal carcasses or a larger number of smaller animal carcasses. Identification of permitted solid waste landfills suitable for the disposal of carcasses should be part of ongoing contingency plans. Only landfills that satisfy requirements for siting with respect to flooding and aquifers, engineered containment, leachate management, and gas management regimes together with prerequisite permit conditions should be considered. Landfills permitted by the CIWMB with WDRs from the Regional Water Quality Control Boards (RWQCB) meet these criteria. Local county environmental health departments, the CIWMB, the RWQCB, or local landfill operators can help identify appropriate permitted landfills.

Carcasses disposed in a landfill undergo chemical, bacteriological, and physical changes. Depending on the material and site conditions, decomposition in a landfill can proceed very slowly over widely varying temperatures that are inadequate for the inactivation of heat resistant organisms and spore formers. There is also a potential for groundwater and surface water contamination from the release of landfill leachate, and the off-site migration of carbon dioxide, and methane gases. Small amounts of poisonous and noxious gases including hydrogen sulfide may also be emitted from landfills.

[See the agency-specific guidance pages of the Integrated Waste Management Board and the State Water Resources Control Board and Regional Boards.]

Rendering

Rendering is a commercial cooking and drying process that converts by-products from meat and poultry production, including animal carcasses, into usable commodities such as animal protein supplements for livestock and pet foods, tallow (a source of energy for feed rations), and fatty acids used in manufacturing processes.

Scientific data confirms that the time–temperature processes of the rendering industry — varying from 240 F to 280 F — will easily inactivate most viruses and even the most resistant strains of bacteria. The only infectious agents that the rendering process may not completely inactivate are prions. These particles are considered the most plausible cause of the transmissible spongiform encephalopathies (TSEs), commonly known as “Mad Cow Disease.”

Rendering as a means of animal disposal offers a relatively safe and integrated system that complies with the fundamental requirements of environmental quality and disease control. The rendering industry must abide by State laws regarding “dead stock” disposal. These laws establish a time limit within which the disposal must take place — usually 24 or 48 hours after death — to avoid nuisance odors and the potential transmission of disease causing pathogens from the carcasses. The “dead stock” is picked up by specially designated and equipped trucks to preclude any possibility of roadway contamination. The trucks are cleaned and disinfected on a schedule after specific routes, are subject to regular inspection, and are legally authorized to enter only licensed and approved facilities. These requirements allow monitoring and regulation of disposal methods assuring compliance with sanitation and hygiene standards. The whole process is necessary for prevention of infectious agents and subsequent disease transmission.

Unfortunately, rendering capacity in California is limited. Most plants are currently operating close to allowable capacity. Urban encroachment has reduced the hours of operation for several key facilities. Local air quality and nuisance regulations would need modification in a declared emergency so that these facilities could increase capacity by extending their hours of operation. Even operating at full capacity, a large-scale EAD would overwhelm California’s rendering plants within a few days.

Because the rendering plants left in California are few and widely scattered, animal carcasses may have to be transported long distances to reach a facility. Unless strict protocols are followed, this transportation can lead to further disease spread.

DISPOSAL SITE OPTIONS

The selection of optimal disposal sites in an animal health emergency involves a variety of factors and concerns. Some of these factors are discussed below.

On-Site Disposal

Historically, diseased carcasses were disposed on the infected premises to avoid spreading the infection by off-site transport. The two most common on-site disposal methods — burial and burning — have potentially serious environmental consequences. Title 27, California Code of Regulations, currently prohibits on-site disposal.

Off-Site Disposal

For off-site disposal, the primary concern is carcass transport in a safe, sanitary, and timely fashion, while not spreading the disease or endangering public health. On-site disposal reduces exposure routes and, for this reason, is preferable to off-site disposal. Methods of carcass disposal, such as rendering and incineration, require off-site transport.

Temporary Storage
Temporary storage may be necessary when off-site disposal is required because of factors such as: climate (e.g., equipment accessibility concerns); highly concentrated animal populations; the presence of wild animals (e.g., coyotes or feral pigs); and insects as disease vectors. In other situations, carcasses or materials may need temporary storage until conditions suit disposal activities (e.g., until rendering or incineration capacity becomes available or until infected premises are more accessible).

Carcasses and other items awaiting disposal must be secured to prevent unauthorized access and potential disease spread to susceptible species. Piling carcasses in a closed building or cold storage facility is one option for temporary storage. Another option is piling the carcasses outdoors on a surface that prevents leaching or runoff, spraying them thoroughly with an appropriate disinfectant, and covering them securely with a tarpaulin. A third approach uses earth-moving equipment to arrange the carcasses in piles on or above the ground surface before covering with soil. Always consider control measures for insects, other fomites, and vectors during temporary carcass storage.

Emergency Carcass Disposal Decision Tree
CDFA veterinarians brought back several recommendations after observing the United Kingdom's (UK) attempts to combat the 2001 foot and mouth disease outbreak. CDFA veterinarians recommend, "California should continue its effort to establish carcass disposal capabilities by region. The capacity of each option and evaluation of possible challenges faced from environmental regulations should be included." We agree that each county or region should make the following evaluations BEFORE a disease outbreak.

1. **Evaluate the ability to temporarily store and/or transport the carcasses.**
   This evaluation impacts the subsequent consideration of other options. Special procedures must be followed to prevent the spread of disease when transporting contaminated material from infected premises to off-site locations. In the event of an EAD outbreak, CDFA approves all carcass transportation procedures. Transportation and temporary storage planning prior to an EAD is critical.

2. **Evaluate the capacity to render or incinerate the carcasses.**
   In the UK's recent foot and mouth disease outbreak, all stakeholders agreed that rendering and fixed-plant incineration were the preferred methods of disposal. It was clear from the start of the outbreak that renderers and incinerators were not immediately available and, even at full capacity, could only partially meet disposal needs. This limited renderer and incinerator capacity is likely in California if large numbers of carcasses need disposal. Regional or local carcass rendering is always the first choice for off-site disposal. Transport of the carcasses must be accomplished in a safe, sanitary, and timely fashion while not spreading the disease or endangering public health. Fixed-plant incineration is the next preferred disposal option. However, the few incineration plants in California are not large enough to accommodate large animal carcasses.

3. **Evaluate the available capacity of licensed, commercial landfills.**
   Because of the containment technologies used at permitted commercial landfills, these sites are the third best environmental solution to the disposal of carcasses. Disease risk from storage and transportation must be well managed in order to use this disposal method.

4. **Evaluate the remaining disposal options, including on-site burning, burial, chemical digesters, and composting; then choose the method of animal carcass disposal.**
   The California Environmental Protection Agency (Cal/EPA), in coordination with the California Department of Health Services (DHS), CDFA, and local jurisdictions, can provide recommendations for the most appropriate method(s) for disposal of dead animals. If burning is utilized, Cal/EPA can recommend fuels and procedures to minimize environmental impact. For burial, Cal/EPA can make best-practice recommendations, and determine, in coordination with CDFA, if dead animal-contaminated materials should be buried on site or transported to an offsite location. If animal mortality and related materials are transported for disposal, Cal/EPA can identify the offsite location and make recommendations in conjunction with the California Department of Transportation, regarding specific transportation requirements. All disposal recommendations will take into consideration biosecurity standards established by the Multi-Agency Coordination Group.

5. **Evaluate the environmental impacts of and best management practices for disinfectants.**
   Cal/EPA and CDFA can consider environmental impacts and make best practice recommendations with regard to disinfectant use for cleaning vehicles, equipment, and facilities. DHS and other appropriate agencies can evaluate potential risks to worker safety, and can make recommendations regarding best practices for worker protection from the disease agent, affected carcasses, or disinfectant chemicals. Cal/EPA can coordinate with local jurisdictions to identify and secure the issuance of any necessary permits, and can record any allowed exemptions from permitting requirements.

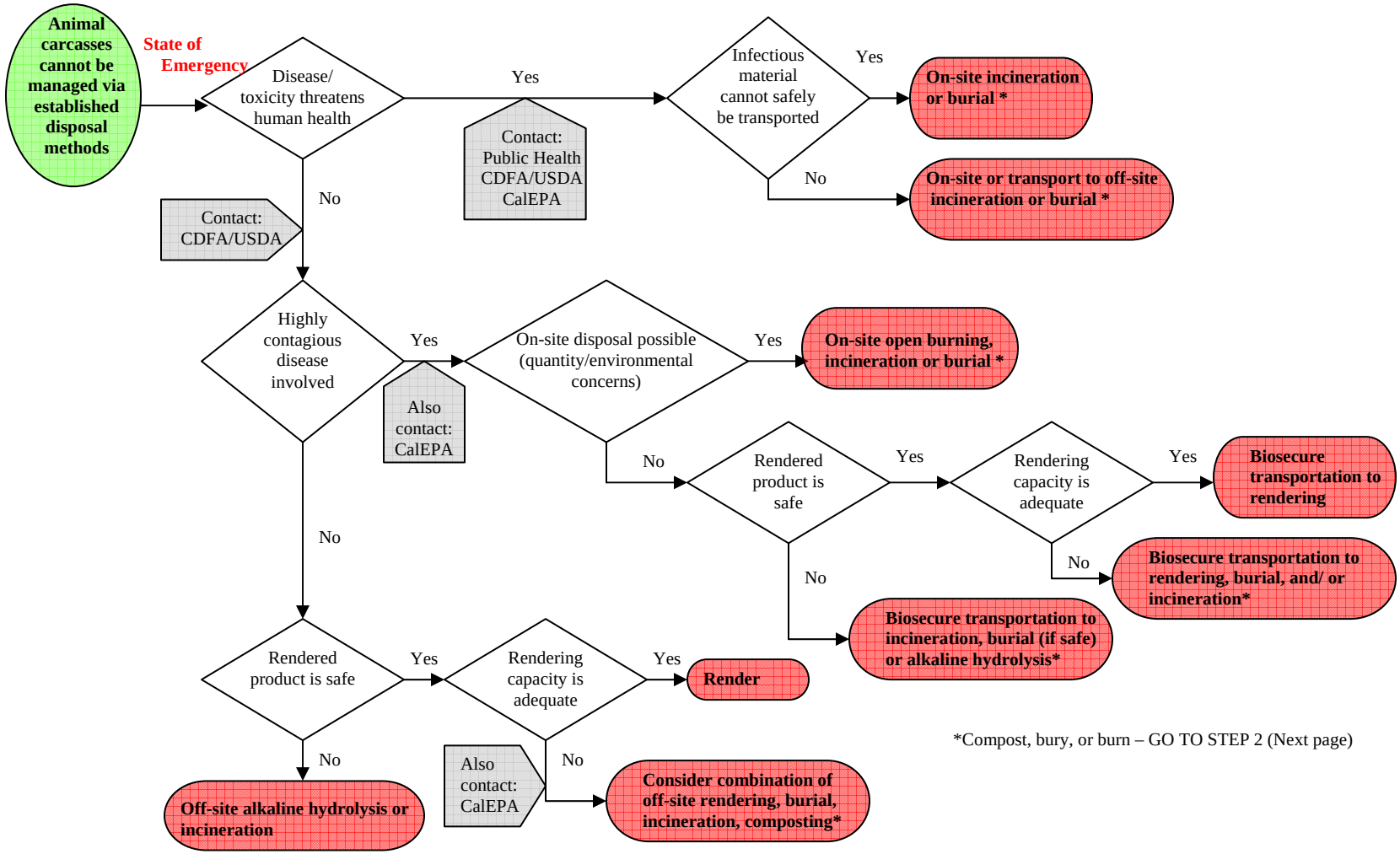
   In the event of a carcass disposal emergency, select the disposal method that offers the best disease control without creating unacceptable human health and environmental risks. More than one method of carcass disposal may be required.

   Refer to the "Emergency Animal Carcass Disposal Decision Tree" on the following page.

EMERGENCY ANIMAL CARCASS DISPOSAL DECISION TREE

Step 1: Determine site

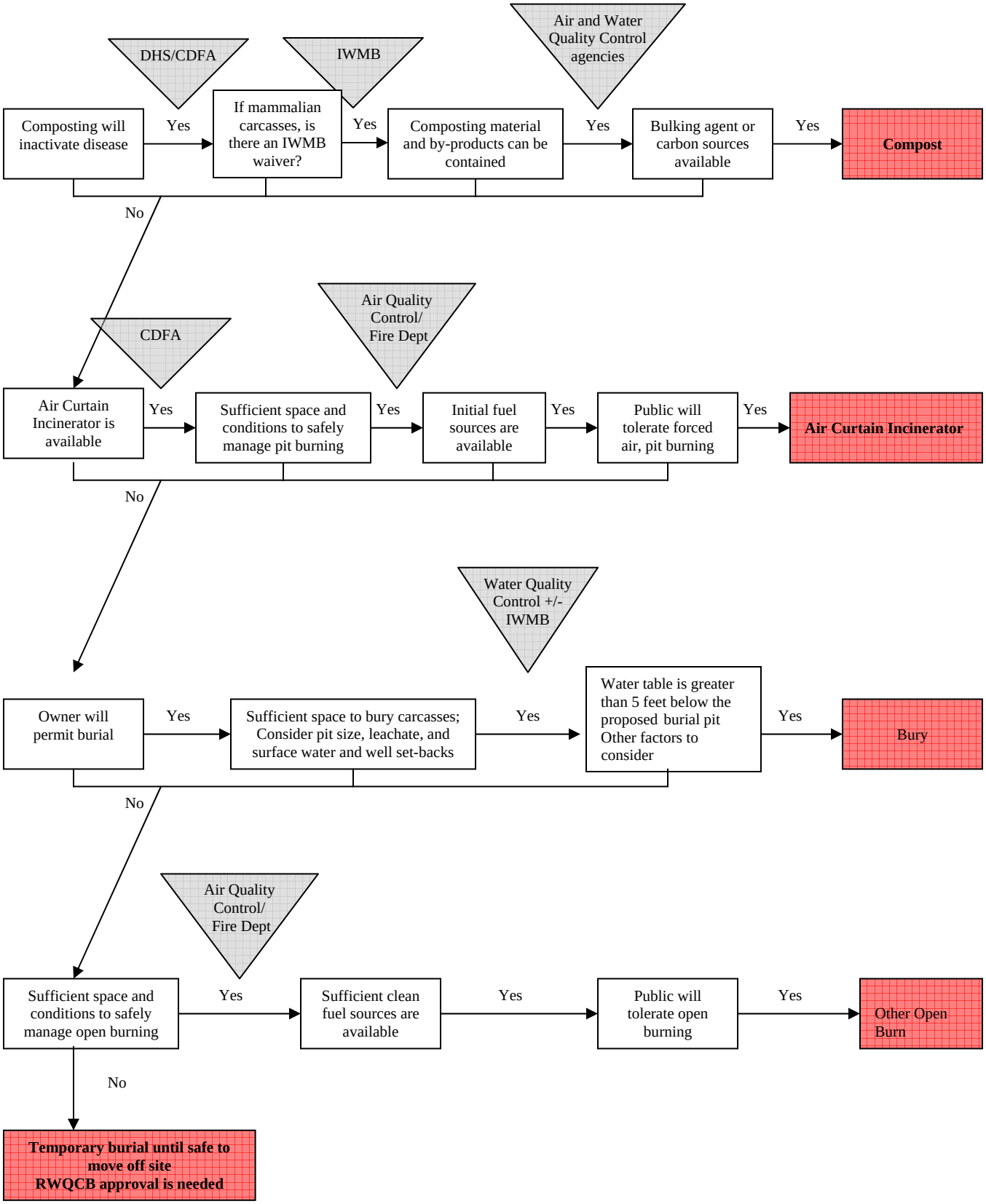
All disposal decisions must be made **after** consultation with public health, animal health, and environmental oversight agencies. An animal carcass disposal emergency may occur after a large, unexpected die-off of animals due to a natural disaster, disease or toxic exposure, or during certain animal disease eradication programs. Factors that will influence disposal decisions include cause of death, urgency of disposal, location, scale of carcass disposal need, costs, and environment oversight concerns.



*Compost, bury, or burn – GO TO STEP 2 (Next page)

Note: The above flow chart offers *basic* guidance for emergency carcass disposal decisions. Actual disposal methods will be determined on a case-by-case basis, and the decision – making process will likely involve additional factors.

***Step 2: Compost, bury, or burn at the site identified in Step 1. As mass to dispose of increases, you may need to use a combination of options.**



Note: The above flow chart offers *basic* guidance for emergency carcass disposal decisions. Actual disposal methods will be determined on a case-by-case basis, and the decision –making process will likely involve additional factors.

Air Resources Board:

1. Purpose and Use of Guidance

The purpose of this section is to outline considerations of an Emergency Animal Disease response for executive managers and staff of the Air Resources Board (ARB) and to discuss coordination with emergency operation center personnel, and other local, state and federal responders. This section anticipates the environmental and/or human health issues within the authority of ARB arising from the immediate disposal of large numbers of animal carcasses. Potential regulatory conflicts and their remedies are described.

2. Program Description

ARB is the State agency charged with overseeing California's air pollution control program. The focus of the program is to achieve State and federal health-based air quality standards. ARB works with local air pollution control districts to make continuous and expeditious progress toward attainment of the federal and State air quality standards throughout California; attain federal air quality standards by the applicable deadlines; continue California's progress in reducing public exposure to toxic air contaminants; and implement and oversee specific air pollution control programs necessary to achieve and maintain air quality standards.

3. Program Authorities

- State law gives ARB the responsibility for implementing specific programs to comply with the State and federal Clean Air Acts. ARB also conducts oversight of local air pollution control district programs.
- ARB provides local districts with technical assistance, guidance, and oversight. ARB works with districts on control technology assessments, reviews district rules, and performs district program audits.
- State law directs ARB to monitor air pollutants in each air basin in the state, in cooperation with local air pollution control districts. ARB uses air quality data to determine the nature of basin pollution problems and to assess effectiveness of control programs. ARB's statewide network of stations monitors for toxic air contaminants as well as for the "criteria" pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter, sulfur dioxide, sulfates, and lead.

4. Program Oversight Responsibilities

- ARB oversees district enforcement programs for stationary sources of air pollution. ARB assists industry and district enforcement personnel by providing new technology and regulatory training courses.
- The primary authority for control (and permitting) of non-vehicular sources of air pollution in California rests with the local air pollution control districts. ARB conducts local program reviews and oversight.

5. Expertise

ARB provides personnel, technical advice, ambient air monitoring of public exposure, air sample analyses, air quality impact modeling and other public health assistance to local agencies during significant hazardous materials incidents or catastrophic events.

6. Carcass Disposal

The ARB recommends using the most environmentally safe methods of animal carcass disposal during an emergency animal disease response. Methods such as landfilling at commercial facilities and fixed-plant incineration offer controlled and monitored disposal situations. The ARB can provide assistance in locating fixed-plant incineration sites, or can link animal emergency response personnel with regional and local contacts to aid in carcass disposal assessments.

Open burning of animal carcasses has been used in past animal disease outbreaks, notably in the United Kingdom's foot and mouth outbreak of 2000-01. This disposal method presents environmental and aesthetic challenges. Ash and other residues may threaten groundwater if left in place or buried. Smoke and particulants may cause health and appearance concerns. Open fires may be hazardous in dry windy conditions. All of these problems must be considered when assessing this disposal option. The following recommendations are intended if open burning of animal carcasses is considered as a disposal option.

7. ARB Recommendations for Open Burning of Animal Carcasses for the Prevention or Abatement of Disease or Pests

If open burning of carcasses is conducted:

- Notify the local air pollution control district and local fire agency of the need to burn, the expected amount of burning, and the expected timing of a burn;
- Do not conduct burning if the local air pollution control district determines that it will cause a public nuisance;
- Notify nearby residents and community members of the need to burn and the expected timing of a burn;
- Avoid burning in close proximity to populated areas, however;
    - If burning must be conducted in close proximity to populated areas, ambient air monitoring in the populated areas should be conducted for fine particulate matter (PM_{10}). Sulfur dioxide monitoring should also be conducted if coal or other high sulfur fuel is used in burning.
- Prepare burn site and dead carcasses in accordance with recommended US Animal and Plant Health Inspection Service – Veterinary Services (APHIS VS) emergency disease guidelines (see Appendix B) and CDFA procedures, incorporating local fire and air pollution control district recommendations;
- Use clean fuel oil such as diesel or kerosene and unpainted/untreated wood for burning;
- Notify the local air pollution control district and local fire agency on the day of the burn prior to ignition;

- Assure that all fire safety and public health protection requirements are met prior to ignition, and, to the extent feasible, ignite the fire on a permissive burn day as determined by the ARB, the local air quality agency, and the local fire agency;
- Initiate burning during acceptable air pollution control district burn hours (typically between 10:00 a.m. and 5:00 p.m.);
- Consider using an *Air Curtain Incinerator* for more efficient open burning. An Air Curtain Incinerator is a mechanical device that forcefully projects a high volume curtain of air into a pit or trench in which open burning is being conducted so that combustion efficiency is increased and smoke and other odors are reduced. However, Air Curtain Incinerators are expensive (~$95,000), require specially trained operators, and are not readily available California at this time. For further information visit manufacturers' Web sites at http://www.airburners.com and http://conceptproducts.com)

8. Air Pollution Permitting Requirements

- When there is no reasonable alternative, open burning of disease-infected or exposed animals is exempt under California Law from open burning prohibitions and air pollution control district permitting requirements.

In California Health & Safety Code §41800, *No Person Shall Use Fires to Dispose of Waste*, prohibits open burning of waste.

> 41800. Except as otherwise provided in this chapter, no person shall use open outdoor fires for the purpose of disposal or burning of petroleum wastes, demolition debris, tires, tar, trees, wood waste, or other combustible or flammable solid or liquid waste; or for metal salvage or burning of motor vehicle bodies.

However, Health & Safety Code §41801, *Authority to Set or Permit Fires; Purposes*, provides exemptions to the open burning prohibition.

> 41801. Nothing in this article shall be construed as limiting the authority granted under other provisions of law to any public officer to set or permit a fire when such fire is, in his or her opinion, necessary for any of the following purposes:
> (a) The prevention of a fire hazard, which cannot be abated by any other means.
> (b) The instruction of public employees in the methods of fighting fire.
> (c) The instruction of employees in methods of fighting fire, when such fire is set, pursuant to permit, on property used for industrial purposes.
> (d) The setting of backfires necessary to save life or valuable property pursuant to Section 4426 of the Public Resources Code.
> (e) The abatement of fire hazards pursuant to Section 13055.

(f) Disease or pest prevention, where there is an immediate need for and no reasonable alternative to burning.
(g) The remediation of an oil spill pursuant to Section 8670.7 of the Government Code.

The open burning disposal of animals infected with or exposed to disease would be considered as non-agricultural burning covered under Health and Safety Code Section 41801(f). This section of code provides authority for non-agricultural open burning for the prevention or abatement of disease or pest prevention where there is an immediate need and no reasonable alternative to burning exists. Any public officer, including the Governor, may permit such fires. Unlike what is required for other types of non-agricultural open burning (such as for non-industrial wood waste — see Health and Safety Code Section 41804.5b), there is no requirement for obtaining an air pollution control district permit nor for the burning to be conducted on a permissive burn day.

Accordingly, <u>when there is no reasonable alternative</u>, open burning of disease-infected or exposed animals is exempt from open burning prohibitions and air pollution control district permitting requirements. Note: Using a biological incineration facility for the disposal of animals is not open burning, and would be subject to the rules, regulations, and permitting requirements of the local air pollution control district with jurisdiction over the facility.

9. Estimated Emissions:

In the event that open burning of diseased animal carcasses is utilized in California, ARB staff has attempted to estimate emissions of criteria pollutants and precursors that would be associated with two methods of burning cattle carcasses. The estimated emissions focus on cattle only. According to USDA staff, the population of other species, such as swine and sheep, susceptible to an EAD is relatively small. However, other non-EAD situations such as floods, fires, etc, can potentially result in large numbers of carcasses needing disposal.

The first method of burning animal carcasses discussed is based on the suggested USDA method. This method uses a combination of fuel oil, coal, wood, old tires, and straw bales. The second method of burning carcasses is based strictly on using fuel oil (50 gallons of fuel oil used to burn one 1200 lb. cattle carcass). **(This method has been used in the San Joaquin Valley in the 1990s.)** The estimated emissions using the different methods of disposing of animal carcasses are contained in the following table (see Attachment 1 for more detail):

Emissions from the Disposal of Cattle Carcasses

(in tons per 1000 head of cattle)

Method of disposal	ROG	NOx	PM
Burial	0	0	0
USDA method	5.5	8.3	14.2
Disposal with fuel oil	0.5	3.8	1.1

Department of Pesticide Regulation:

1. Purpose and Use of Guidance

The purpose of this section is to outline considerations of an emergency animal disease response for executive managers and staff of the Department of Pesticide Regulation (DPR) and to discuss coordination with emergency operation center personnel and other local, state and federal responders. This section anticipates the environmental and/or human health issues within the authority of the DPR arising from the immediate disposal of large number of animal carcasses. Potential regulatory conflicts and their remedies are described.

2. Program Description.

DPR regulates all aspects of the registration, review and use of pesticides in the state. DPR is authorized by the USEPA to implement federal laws and standards at the state and local level. DPR is also responsible for California-specific pesticide laws and regulation.

3. Program Authorities.

In the event of an EAD, DPR's oversight is limited to the use of pesticides, including disinfectants, used to control the disease and/or vectors of the disease. DPR's authority derives from the Food and Agriculture Code, Division 6 and Division 7 and the California Code of Regulations, Title 3, Division 6.

DPR and local County Agricultural Commissioners could conduct inspections and investigations to determine if pesticides used in a EAD outbreak are properly registered or otherwise authorized by the USEPA and DPR for the intended use; that commercial applicators are licensed by DPR and registered in the county where they work; and that pesticide labels, with required human/environmental warnings and use directions, are on site. Pesticide applicators must comply with all pesticide label requirements, regulations, and permit conditions (if applicable). Commercial pesticide applicators under contract to USDA or CDFA shall be licensed by DPR and registered by the local agricultural commissioners in the counties where work is performed. When required, government/agency pesticide applicators are properly certified by DPR and registered in the county where the work is performed. Pesticide handlers (employees) shall be trained and properly supervised during pesticide applications. Training records, use reports, etc., and other documentation shall be maintained, submitted if required, and made available upon request for inspection.

4. Expertise.

DPR provides support information on the proper use of pesticides registered in the state. Questions concerning pesticide exposure to people and the environment may be directed to DPR. DPR and/or its local enforcement agents, the county agricultural commissioners, may conduct investigations of pesticide misuse, take samples relating to pesticide misuse, or conduct inspections of pesticide use.

Department of Toxic Substances Control:

- **Purpose and Use of Guidance**
  The purpose of this section is to outline considerations of an Emergency Animal Disease response for executive managers and staff of the Department of Toxic Substances Control (DTSC), and to discuss coordination with emergency operation center personnel, and other local, state and federal responders. This section anticipates the environmental and/or human health issues within the authority of (DTSC), arising from the immediate disposal of large numbers of animal carcasses. Potential regulatory conflicts and their remedies are described.

- **Program Description.**
  The mission of DTSC is to protect public health and the environment from harmful exposure to hazardous substances without unnecessarily impacting sustainable growth and development.
  Protection of public health and the environment is the focus of all DTSC programs; and all permitting, site cleanup, pollution prevention, environmental technology certification, public participation, and education activities are driven by this mandate. DTSC is responsible for regulating hazardous waste facilities and overseeing the cleanup of hazardous waste sites in California. DTSC also provides emergency response removal and technical assistance to other state and local agencies.

Program Authorities.
DTSC is authorized, Health & Safety Code (HSC) Chapter 6.5, to regulate all activities involving hazardous wastes including:

- Generation
- Transfer and Handling
- Transportation
- Storage
- Treatment and Recycling
- Disposal

The State is authorized by USEPA to implement the Federal Resource Conservation and Recovery Act (RCRA). Regulations covering these authorities include Title 22, California Code of Regulations (Division 4.5) and Title 40, Code of Federal Regulations (Parts 260-279).

Facility Permitting, Closure, Corrective Action, and other grants of authorization are regulated by the Hazardous Waste Management Program, as are Inspections, Enforcement Orders, Complaint Response, Financial responsibility reviews, and Transporter Registrations. Some aspects of the regulatory programs, including Hazardous Waste Generator and Onsite Tiered Permitting programs, have been delegated to local jurisdictions called Certified Unified Program Agencies (CUPA).

Generally, non-hazardous waste activities, including those involving “solid wastes” and “infectious wastes” are unregulated by DTSC.

DTSC is authorized, under Health & Safety Code (HSC) Chapter 6.8, to investigate and remediate releases of hazardous substances that pose a threat to public health or the environment. Authorities are provided for enforcement actions against responsible parties or to expend state funds on orphan sites or to meet the statutorily required match for Federal Superfund sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

4. Program Oversight Responsibilities.

Hazardous Waste Landfills – State and federal statutes and regulations administered by DTSC do not expressly prohibit acceptance of dead animals, but these landfills do have site-specific prohibitions in their permit conditions. Acceptance of dead animals or infectious or biological wastes is expressly prohibited in permits. These landfills are specifically designed to minimize the production of leachate and gases. Land disposal restrictions mandated by federal and State regulations (CCR Title 22, Chapter 18) mandate the control of liquid and gas production in regulated disposal units. The addition of large numbers of dead animals would be incongruent with those mandates and incompatible with measures designed to preclude mobility of contaminants and exposure to workers, the public, and the environment.

Note: Solid Waste Landfills are regulated by the California Integrated Waste Management Board and are considered an appropriate disposal option for animal carcasses.

The open burning of dead animals would not be regulated by DTSC unless hazardous waste derived fuels were utilized. Guidance from USDA and CDFA provides recommendations on disposal of animal carcasses. The use of “clean” fuel sources is recommended in these documents. Health and Safety Code § 41801(f) provides exemption to prohibitions for non-agricultural burning for “disease or pest prevention, where there is immediate need for and no reasonable alternative to burning.”

Direct burial of dead animals is not specifically regulated by DTSC unless it encroaches on a hazardous substance release site or treatment, storage, or disposal facility regulated by DTSC. On-site disposal of dead animals, as recommended by USDA and CDFA, would not necessitate further discretion of DTSC.

5. Expertise.

DTSC has emergency response staff located at five of six regional offices around the State. Even though not specifically trained to deal with EAD, biological or infectious disease threats, they are trained and experienced in managing hazardous substance aspects of transportation and industrial facility accidents, fires, floods,

man-made disasters, and removal of threats at illegal drug manufacturing laboratories. These individuals are familiar and experienced with the Standardized Emergency Management System (SEMS) utilized in California for disaster response.

Other support capabilities that have analogous roles in the hazardous waste field might include:

- Hauler registration
- Manifesting of waste (cradle to grave)
- Information management
- Public information
- Community relations
- Industrial health and safety
- Toxicology (some Veterinary staff have EAD experience)
- Engineering support
- Legal
- Contract procurement and administration

It should be noted that few, if any, DTSC staff have current training or familiarity with dealing with EAD or infectious waste response.

Integrated Waste Management Board:

1. **Purpose and Use of Guidance**
   The purpose of this section is to outline considerations of an Emergency Animal Disease response for executive managers and staff of the Integrated Waste Management Board (IWMB), and to discuss coordination with emergency operation center personnel, and other local, state and federal responders. This section anticipates the environmental and/or human health issues within the authority of IWMB arising from the immediate disposal of large numbers of animal carcasses. Potential regulatory conflicts and their remedies are described.

   The guidance provided in this document does not apply to hazardous waste [as defined in Public Resources Code (PRC), section 40141] or medical waste [regulated pursuant to the Medical Waste Management Act (Health and Safety Code, Division 104, Part 14)]. The Department of Health Services does not consider diseased dead animals to be medical waste.

   In the event of a state of emergency or local emergency, many of the regulations and permit conditions referenced below can be waived pursuant to California Code of Regulations, Title 14, Div. 7, Ch. 3, Article 3. Local Enforcement Agency (LEA) Advisory #41 (http://www.ciwmb.ca.gov/LEAAdvisory/41/default.htm) provides guidance on the emergency waiver approval process, including examples of requests for and approvals of a waiver. LEA Advisory #43 (http://www.ciwmb.ca.gov/LEAAdvisory/43/default.htm) provides additional general guidance on disaster assistance.

2. **Program Description**
   IWMB is responsible for protecting the public's health and safety and the environment through proper management of solid waste (including waste tires, used oil, and household hazardous waste). IWMB works in partnership with local government, industry, and the public to divert or recover valuable resources from the waste stream, reduce waste disposal, and ensure environmentally safe solid waste and waste tire facilities.

3. **Program Authorities**
   IWMB is authorized to regulate solid waste handling, transfer, composting, transformation, and disposal. IWMB has adopted regulations that set forth:

   - Permitting requirements and operating standards for **transfer/processing operations and facilities** and **composting operations and facilities**;
   - Performance-based standards for the management of **agricultural wastes**;
   - Permitting requirements, operating standards, closure/postclosure standards, and financial assurances requirements for **solid waste landfills**.

The governing body of a county or city may designate a LEA. Upon certification by IWMB, LEAs implement delegated IWMB programs and locally designated activities. LEAs have the primary responsibility for ensuring the correct operation and closure of solid waste facilities in the state. They also guarantee the proper storage and transportation of solid wastes. See the Contact Information heading below for LEA contact information.

Generally, if occurring on-site on agricultural land, the burial, burning, or composting of the following materials is not regulated as a solid waste landfill, transfer/processing operation or facility, nor composting operation or facility:

- Animal carcasses;
- Animal by-products (e.g., manure, milk, urine);
- Animal feed;
- Animal bedding;
- Ash resulting from the burning of animal carcasses, by-products (e.g., manure, milk, urine), feed, or bedding.

For guidance related to these activities on agricultural land, interested parties should contact the appropriate Regional Board, USDA and/or CDFA.

4. Program Responsibilities

- **Transfer/Processing Operation or Facility – CCR, Title 14, Division 7, Chapter 3, Article 6**

If it is necessary to transport animal carcasses or any other contaminated materials, 14 CCR 17403.5 provides for the establishment and operation of an emergency transfer/processing operation to assist with the recovery and clean-up from a state or local emergency.

- **Composting Operation or Facility – CCR, Title 14, Division 7, Chapter 3.1**

The composting of mammalian flesh, organs, unprocessed hide, blood, bone and marrow at a composting operation or facility is prohibited by 14 CCR 17852(i). This means that mammalian carcasses cannot be transported offsite to a composting facility. The composting of manure, feed, or bedding is not prohibited; however, great caution should be taken if composting is utilized as a management measure. The composting process requires feedstock preparation, which typically includes the mechanical reduction in the size of feedstock materials. This preparation could significantly increase the exposure to disease pathogens.

- **Agricultural Solid Waste Management Standards - CCR, Title 14, Division 7, Chapter 3, Article 8**

Generally, if occurring on-site on agricultural land, the burial of animal carcasses is not regulated as a solid waste landfill. However, the following standards are intended to eliminate excessive vectors or other adverse public health/well-being effects associated with agricultural operations and to promote conditions under which agricultural operations and residential or public use of properties can co-exist.

14 CCR 17820. Agricultural Solid Wastes As a Public Health/Well-Being Hazard.
(H) Any person who sustains, stores, manages or receives agricultural by-products or other waste materials generated as a result of the operation of any agricultural property or produce processing plant shall do so in such a manner as to prevent the spread of disease, the occurrence of excessive vectors, odor, dust, or feathers or other such adverse conditions related to the public health and well-being. In addition:
(a) The presence of excessive vectors on the property shall be prima facie evidence that an adverse public health/well-being hazard exists.
(b) The determination of the presence of excessive vectors shall be made by an Enforcement Agency or the Department.
(c) The determination of the presence of excessive vectors shall take into account the proximity of the agricultural operation to neighboring human habitation and use areas, the population density of the entire area and the severity of the public health/well-being hazard posed by said vectors.

14 CCR 17822. Correction of Adverse Public Health/Well-Being Conditions.
(H) When the Enforcement Agency or the Department determines that design and layout of agricultural operations or management of agricultural wastes result in the occurrence of excessive vectors or any other adverse public health/well-being related conditions, the owner or operator of the property shall be informed in writing of a violation of these standards and shall be required to institute appropriate measures promptly to correct the condition in a manner approved by the Enforcement Agency or the Department.

14 CCR 17823.5. Dead Animals.
(H) The carcasses of animals with any contagious disease shall be disposed of by means prescribed by the California Department of Food and Agriculture, Division of Animal Industry. Animal carcasses from confined animal operations shall be collected, stored, and removed from the property to an approved processing facility or disposal site prior to the creation of adverse public health/well-being conditions, or processed or disposed of on the property in a manner approved by the Enforcement Agency. Animal carcasses from animals on pasture or rangeland shall be managed so as to prevent the creation of excessive vectors or other adverse public health/well-being conditions.

In addition to the guidance provided in the USDA Foot-And-Mouth Disease Guidelines, Section 7.7 - Disposal (see Appendix), persons burying animal carcasses or ash should adhere to the following in addition to requirements established by the appropriate Regional Board:

- To the extent feasible, cremation should use only clean fuel sources (i.e., no trash; garbage; treated wood; or tires) so as to avoid production of contaminated ashes.
- Disturbed soils should be seeded/mulched for erosion control after burial.

- A location map/report for all burial activities should be filed with local environmental health officials.
- The site selected for burial and cremation should be as great a distance from surface water and groundwater as possible.

Tires are not recommended as a fuel source. Please refer to the ARB section discussion of open burning.

If tires are used as a fuel source, the ash may be oily/sticky (depending on the temperature reached) and it will be difficult to prevent any oil from seeping into soils. If the ash will be buried on-site, the disposal pit should be dug prior to cremation and as near as possible to the pyre so the ash can be moved as soon as it can be handled.

- **Solid Waste Landfills - CCR, Title 27, Division 2, Subdivision 1**

State solid waste statutes and regulations administered by the IWMB do not expressly prohibit acceptance of dead animals, but landfills may have site-specific permit conditions. Acceptance of diseased dead animals will depend on each individual permit, and whether or not it prohibits/limits/allows/is silent on disposal of dead animals.

If the permit prohibits dead animals or the number of dead animals exceeds permit limits, the owner/operator may seek a waiver (See LEA Advisory #41 in Appendix for guidance on issuance of waivers).

If the number of dead animals disposed does not exceed permit limits, the owner/operator of the landfill should verify that the Report of Disposal Site Information for the landfill adequately addresses acceptance of dead animals. If not, the owner/operator must submit an amendment to the Report of Disposal Site Information pursuant to 27 CCR 21665.

If the permit is silent, dead animals may be acceptable without a permit revision or waiver in accordance with the following standard:

27 CCR 20890. CIWMB - Dead Animals. (T14: §17744)
Dead animals may be accepted if allowed by local regulations and shall be covered immediately or at a frequency approved by the Local Enforcement Authority.

Landfill operators can find guidance on burial of animal carcasses in:

- USDA Foot-And-Mouth Disease Guidelines, Section 7.7.1. - Burial (see Appendix B), and
- Recommended Interim Practices for Disposal of Potentially Contaminated Chronic Wasting Disease Carcasses and Wastes (see Appendix C.)

The open burning of solid waste, except for the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees, or debris from

emergency cleanup operations, is prohibited at any solid waste facility pursuant to Public Resources Code Section 43022(a). Animal carcasses, by-products (e.g., manure, milk, urine), feed, or bedding resulting from an emergency animal disease outbreak may be considered debris from an emergency cleanup and can not be burned at a solid waste facility.

5. Expertise

Methane Monitoring

Methane is a colorless, odorless gas produced by anaerobic bacterial decomposition of plant and animal matter. At room temperature, methane is a gas less dense than air. It is not very soluble in water. Methane is combustible, and mixtures of about 5 to 15 percent in air are explosive. Methane is not toxic when inhaled, but it can produce suffocation by reducing the concentration of oxygen inhaled.

Federal and state standards for the control of methane require owner/operators of solid waste landfills to ensure that the concentration of methane gas generated by a facility does not exceed:

- 25 percent of the lower explosive limit for methane (1.25% by volume) in on-site structures;
- The lower explosive limit for methane (5% by volume) at the facility boundary.

Monitoring is not required by the Integrated Waste Management Board for on-site burial (e.g., not at a solid waste landfill) however, it is highly recommended. The anaerobic bacterial decomposition of buried animals will produce methane. Monitoring will alert control agencies of potential hazardous conditions and the need to employ mitigation measures. IWMB staff and IWMB-certified local enforcement agencies are trained to monitor for methane, have monitoring equipment available, and are available to assist with the development and implementation of monitoring programs.

Office of Environmental Health Hazard Assessment:

1. Purpose and Use of Guidance

The purpose of this section is to outline considerations of an Emergency Animal Disease response for executive managers and staff of the Office of Environmental Health Hazard Assessment (OEHHA), and to discuss coordination with emergency operation center personnel, and other local, state and federal responders. This section anticipates the environmental and/or human health issues within the authority of (OEHHA), arising from the immediate disposal of large numbers of animal carcasses. Potential regulatory conflicts and their remedies are described.

2. Program Description.

OEHHA's mission is to protect and enhance public health and the environment by objective scientific evaluation of risks posed by hazardous substances.

3. Program Authorities.

OEHHA's Program Authority is the Emergency Response Administrative Order under the authority of the California Emergency Services Act, the Governor's letter to Agency Secretaries dated 9/12/00, Executive Order W-9-91 dated 5-29-91, and the California State Emergency Plan

4. Program Oversight Responsibilities.

OEHHA does not have direct regulatory authority over EAD eradication programs.

OEHHA will coordinate with the appropriate responding agencies to provide timely and accurate health effects information to:

- Provide health information to incident command.
- Provide consultation on environmental sampling and residual risks associated with remediation.
- When consistent with SEMS, support local health agencies and health professionals following chemical releases, providing toxicological information.
- Provide information on public health risk and environmental threats of hazardous substances.
- Identify, document, and when practical, implement those activities that potentially could reduce or lessen the impact of an emergency.

5. Expertise.

- Assist responders in assessing potential exposures for decisions on re-entry.
- Assist in environmental fate assessment, determining health and environmental consequences of breakdown products, reaction products, and intermedia transfers.
- In consultation with DHS, OEHHA performs or contracts epidemiological studies to ascertain health effects related to exposure to hazardous materials.

State Water Resources Control Board and Regional Water Quality Control Boards:

1. **Purpose and Use of Guidance**
   This section provides information for executive managers and staff of the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) related to EAD response activities. The following issues are addressed:
   - Coordination with emergency operation center personnel and other responders
   - Identification of the environmental and/or human health issues within the purview of the SWRCB and/or RWQCB that may arise from the need to immediately dispose of a large number of animal carcasses
   - Identification of potential regulatory conflicts, and development of remedies that can be rapidly implemented under emergency conditions.

2. **Program Description.**
   The following is a summary of the preparedness, response, recovery, and mitigation activities that SWRCB and/or RWQCB may undertake in response to an EAD. The full range of activities is described in the SWRCB-RWQCB Administrative Order in the California State Emergency Plan.
   - Maintain a listing of Hazardous Waste Disposal Sites.
   - Maintain databases containing information on water quality and water users.
   - Coordinate with local government and state agencies to issue Cleanup and Abatement Orders (CAO), Cease and Desist Orders (CDO), or other water quality orders; and to assess Administrative Civil Liability (ACL) penalties for violations of the California Water Code.
   - Provide geologists and engineers to advise on the integrity of landfill liners, slopes, and surface impoundments.
   - Provide technical staff to advise on regulatory requirements and the potential impact to water quality from emergency response and recovery activities, and to recommend methods for control and mitigation of such impacts.
   - Provide technical staff to advise on the potential impacts of a hazardous material incident on water resources.
   - Conduct surface and groundwater sampling, monitoring, analyses, and assessment activities. Provide water quality monitoring support including trained staff, equipment, vehicles, boats, and analytical laboratory services.
   - Provide available information on quality, location, and downstream users of both surface and groundwater.
   - Facilitate the release of available funding for appropriate cleanup and abatement, recovery, and mitigation activities.
   - In consultation with the Department of Toxic Substances Control (DTSC), provide guidance on options concerning diversion, containment, treatment, and temporary storage of hazardous waste.

- Review the environmental documentation for recovery and mitigation activities, and any applications for federal permits for activities that discharge to surface waters.

3. Program Authorities.

State law and regulations pertaining to this issue can be accessed at SWRCB's home page (http://www.swrcb.ca.gov). Additional Web site URLs are provided in Section 6. Applicable laws, regulations, and policies are identified below.

- **State Regulations and Policies:**
  - California Code of Regulations:
    - Title 22 Regulations: reclamation, and hazardous waste generation and disposal
    - Title 27 Regulations: Class II and Class III landfills and confined animal facilities
    - Title 23 Regulations: Class I landfills, SWRCB procedures and the California Environmental Quality Act
    - Title 14 Regulations: California Environmental Quality Act compliance
  - SWRCB Resolution 68-16: Anti-degradation Policy:
    - Best practical treatments are required to prevent nuisance and maintain the highest quality water
    - New discharges cannot result in exceedances of water quality objectives
  - SWRCB Resolution 88-63: Sources of Drinking Water Policy:
    - Establishes that all waters not otherwise designated are sources of drinking water
    - A Basin Plan amendment is needed to implement exceptions
  - SWRCB Resolution 92-49: Cleanup procedures and policies:
    - Requires cleanup to achieve lowest pollution level technically and economically feasible
    - Requires that water quality objectives or criteria for containment zones be achieved
    - Allows enforcement through Cleanup and Abatement Orders
  - RWQCB responsibilities for protecting the waters of the State, as defined in Division 7, Chapter 4 of the California Water Code:
    - Adopt Regional Water Quality Control Plans, also known as Basin Plans, to establish water quality objectives that will ensure the reasonable protection of beneficial uses, and to implement a program for achieving water quality objectives
    - Require Technical Reports that will provide a basis for water quality protection decisions
    - Adopt Waste Discharge Requirements (WDRs) that implement the Basin Plan
    - Adopt Progressive Enforcement Orders if needed to Enforce the WDRs
    - Refer cases of non-compliance to the Attorney General for enforcement
  - RWQCB responsibilities for protecting the waters of the United States, as defined in Division 7, Chapter 5.5 of California Water Code:

- Act in a manner consistent with the Federal Clean Water Act (CWA)
- Prepare and adopt National Pollutant Discharge Elimination System (NPDES) Permits that contain effluent limits that will meet federal water quality standards and other provisions of the CWA
- Take appropriate enforcement action, as needed

- ***Adoption of Waste Discharge Requirements***
  Under Water Code §13260(a), any person discharging or proposing to discharge waste within any region that could affect water quality is required to file a Report of Waste Discharge (ROWD). If the ROWD indicates that water quality could be affected by the proposed discharge, the RWQCB has a statutory obligation to prescribe WDRs, which may include a prohibition against the discharge. While an RWQCB can delegate to its Executive Officer a wide variety of powers and duties under the Water Code, the issuance of waste discharge requirements is a non-delegable function (Water Code §13223(a)). All WDRs must be formally adopted by the RWQCB.

  In accordance with §13269 of the Water Code, the statutory mandate that WDRs be adopted may be conditionally waived by an RWQCB for up to five years where such waiver is not against the public interest (see Waivers, below).

- ***General Waste Discharge Requirements***
  Both SWRCB and RWQCBs can prescribe general WDRs that apply to a category of discharges (Water Code §13263(i)). All of the following criteria must apply before either body issues general WDRs:
  - The discharges must be produced by the same or similar operations;
  - (2) The discharges must involve the same or similar types of waste;
  - (3) The discharges require the same or similar treatment standards, and
  - The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements

  Thus, either SWRCB or RWQCBs, after complying with the California Environmental Quality Act (CEQA), could adopt general requirements that apply to all mass animal carcass burial operations conducted to abate the effects of an emergency animal disease outbreak. Because adopting general WDRs in this manner could take many months, such action should be initiated as soon as possible.

- ***Waivers***
  <u>Five-Year Waiver</u>
  Pursuant to Water Code §13269(a), an RWQCB may waive the discharger's obligation to file an ROWD and obtain WDRs if the waiver is not against the public interest. The waiver, which cannot be valid for more than five years without being renewed, must impose conditions on the discharge and is subject to RWQCB or SWRCB enforcement (Water Code §13269(a)).

Emergency Waiver

Land disposal or burial of dead animals on site would normally be considered waste disposal under the Water Code and would require submittal of an ROWD, public notice of the proposal, and formal approval by a RWQCB through formal issuance of WDRs or a waiver from WDRs by an RWQCB. Under emergency conditions where the Governor has declared a state of emergency, the discharge of waste may be allowed by an RWQCB without adoption of either WDRs or a waiver from WDRs, in accordance with provisions contained in Water Code §13269(c) and (d), which provide an alternate regulatory procedure.

For immediate emergency work necessary to protect life or property in a disaster-stricken area, including the disposal of animal carcasses, the requirement to file an ROWD and obtain WDRs will be temporarily waived for that area only as long as the discharger notifies the RWQCB before commencing the emergency work (Water Code §13269(c)(1)).

- ***Cleanup and Abatement Orders (CAO)***
  In the event that on-site disposal activities related to an EAD threaten to impact water quality, the RWQCB could issue an individual or region-wide CAO requiring each waste disposal site owner and operator to conduct cleanup activities. Under Water Code §13304, the RWQCB may issue a CAO to anyone who "has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state." The RWQCB will order the discharger to clean up the waste or take other action necessary to remedy the actual or potential discharge. If necessary, the RWQCB will refer CAO violators to the California Attorney General, who then seeks an injunction with the Superior Court of the affected county.

- ***Regulation of Waste Disposal Sites***
  SWRCB's regulations for waste disposal sites are in CCR Title 23, Division 3, Chapter 15, (23 CCR), and CCR Title 27, Division 2, Subdivision 1 (27 CCR). Those regulations define four types of waste: hazardous waste, designated waste, nonhazardous solid waste, and inert waste.
  - Hazardous waste as defined by DTSC (23 CCR §2521(a)), excludes from its definition infectious waste that consists solely of the carcasses of animals not otherwise hazardous, and that are handled, stored, and disposed of according to CDFA's requirements, found in the Food and Agricultural Code, Chapter 1, Part 1, Division 5 (commencing with section 9101), and Chapter 5, Part 3, Division 9 (commencing with section 19200).
  - Designated waste consists of nonhazardous waste that could degrade waters of the State (see also Water Code §13173).
  - Nonhazardous solid waste is defined as solid waste that does not contain hazardous or designated wastes (27 CCR §20220(a)).
  - Inert waste is that subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water

quality objectives, and does not contain significant quantities of decomposable waste.

Designated wastes may be discharged only at Class I or Class II waste units that have been specifically approved for containment of the particular type of waste to be discharged (27 CCR §20210). Nonhazardous wastes may be discharged at any classified landfill, including Class III units, that is authorized to accept the specific waste (27 CCR §20220(b)). All new Class III units must meet the requirements in 27 CCR, SWRCB Resolution 93-62, and 40CFR Part 258. These landfills must have a composite liner consisting of clay and geosynthetic material and a leachate collection and removal system.

Because burial areas used for animal mortality are considered waste management units as defined in 27 CCR §20164, WDRs would normally be developed for such disposal areas (27 CCR, §21710). However, these regulations *will not apply* if the RWQCB waives submittal of an ROWD pursuant to Water Code §13269(a) or (c).

If an RWQCB requires submittal of an ROWD, the RWQCB may waive WDRs pursuant to the emergency provisions of Water Code §13269(c), or may issue WDRs that implement 27 CCR. If the RWQCB issues WDRs, the discharger must follow whatever waste management unit provisions are prescribed. The RWQCB may approve an engineered alternative to the construction or prescriptive standards in 27 CCR if the discharger can demonstrate that the waste management unit design standard is not feasible, and that the engineered alternative affords equivalent protection against water quality impairment (27 CCR §20080(b and c). These provisions may be applicable during an EAD outbreak. If applicable, the RWQCB could approve an alternative only after determining that the alternative affords equivalent protection against water quality impairment.

4. Program Oversight Responsibilities.

The primary interests of the SWRCB and RWQCBs in responding to an outbreak of an EAD are the protection of water quality and the prevention of the spread of disease. The principal threat is believed to be percolation of nitrates and other constituents to groundwater from the decomposition of animal carcasses buried on-site, but carcass burning may also threaten groundwater. Runoff to surface waters from exposed carcasses and leakage from containers during transport are considered lesser threats. Disposal at an unlined landfill is also considered a lesser, but not insignificant, threat. The principle contaminants of concern are pathogens, nutrients, biochemical oxygen demand (BOD) and unburned fuels or residuals of combustion from carcass burning. SWRCB and RWQCB oversight responsibilities are discussed in more detail in Section 3, above.

5. Program Expertise.

- If a large quantity of animal mortality is transported to a landfill:

  - The RWQCB may impose additional groundwater monitoring requirements on the landfill for pathogens and other potential contaminants from the carcasses (e.g., fecal coliform and nitrogen species), pursuant to 27 CCR.
  - Landfills that accept EAD-infected animals need a contingency for potential BOD or other contaminant loads that may adversely impact operation of the leachate treatment system.
- If a large number of diseased animal carcasses require burning:
  - The emergency response team may need to collect any residual ash and carcass remains for disposal in an appropriate landfill. If transporting residual ash to an off-site location is not feasible, the residual ash and carcass remains in the on-site burial trench should be monitored in accordance with Title 27 regulations.
  - The volume and type of any chemicals or additives used to accelerate the burning process should be recorded and submitted in a disposal report to the RWQCB.
  - Any related disposal methods are to be conducted in accordance with Title 27 regulations.
- If a large number of diseased animals require on- or off-site burial:
  - In many situations, burial is the least preferred option Burial should be implemented only if there is a small quantity of animals or residual ash and carcass material. All burial methods should be conducted in accordance with Title 27 regulations. BSE-infected animals should <u>not</u> be buried under any circumstance because of the potential for groundwater contamination.
  - An assessment of groundwater depth should be completed prior to burial. The bottom of the excavation trench must be more than 5 feet above the first encountered groundwater. However, it is recommended that the burial trench be placed in an area with appropriate soils (loam or finer) and with groundwater greater than 10 feet below the bottom of the trench.
  - EAD-infected carcasses should not be buried within 1,000 feet of any water supply well.
  - Large quantities of body fluids may be generated during decomposition if animals are buried without first treating the carcasses. A liner effective in containing body fluid leakage in the burial trench may be necessary. However, constructing lined disposal trenches or pits may not be practical during an initial emergency response action. Therefore, unlined excavations or mounds may be utilized for temporary and prompt disposal of animal mortality. Approximately 3 feet of soil cover should be placed on the temporary burial trenches to control flies and vermin. If unlined trenches or pits are used, replacement burial trenches and/or pits should be constructed in accordance with Title 27 regulations.
  - A licensed surveyor should survey the burial location after burial has been completed. A burial report, including a description of the burial trench liners, shall be submitted to the local RWQCB or SWRCB.

6. Laws and Regulations

The California Water Code can be accessed on the Internet at:
http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=wat&codebody

The land disposal regulations can be accessed on the Internet at:
http://www.swrcb.ca.gov/

The California Code of Regulations (CCR) can be accessed on the Internet at:
http://ccr.oal.ca.gov/

APPENDICES

Appendix A

1. California Environmental Quality Act Compliance
2. Cal/EPA Boards and Departments Contact Information

Appendix B Foot-And-Mouth Disease Emergency Disease Guidelines, Revised June 1992, Chapter 7.7, Disposal: United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Service

Appendix C Recommended Interim Practices for Disposal of Potentially Contaminated Chronic Wasting Disease Carcasses and Wastes

APPENDIX A

California Environmental Quality Act Compliance
CEQA provides a statutory exemption from all CEQA requirements for "specific actions necessary to prevent or mitigate an emergency," and the definition of an emergency would include a possible outbreak of animal disease (see Public Resources Code §21060.3). Additionally, it would not be necessary for either the state or federal government to officially declare that an "emergency" exists. An exemption from CEQA requirements is provided for any situation that meets the CEQA definition of an "emergency," and this definition (in Public Resources Code 21060.3) does not require that the state or federal government must take any official action to declare an "emergency" before the exemption is triggered.

Contact Information
A staff directory for Cal/EPA and each of its Boards, Departments, and Offices (listed below) is available at http://www.calepa.ca.gov/StaffDirectory/.

- **Cal/EPA** http://www.calepa.ca.gov
- **Air Resources Board** http://www.arb.ca.gov
- **Department of Pesticide Regulation** http://www.cdpr.ca.gov
  - Enforcement Branch: for information concerning the interpretation of pesticide labels.
  - Registration Branch, Information Center: for information concerning the registration status of pesticides.
  - Licensing and Certification Program: for information concerning the status of licensed commercial applicators.
  - County Agricultural Commissioners can assist pesticide users. County Agricultural Commissioner addresses are listed in local phone directories under county government offices, or on the CDPR and CDFA websites.
- **Department of Toxic Substances Control** http://www.dtsc.ca.gov
- **Integrated Waste Management Board** http://www.ciwmb.ca.gov
  - Local Enforcement Agencies http://www.ciwmb.ca.gov/LEACentral/LEADirectory/
- **Office of Environmental Health Hazard Assessment** http://www.oehha.ca.gov
- **State Water Resources Control Board** http://www.swrcb.ca.gov
  - Regional Water Quality Control Boards http://www.swrcb.ca.gov/contact/docs/rwqcbs_directory.pdf

United States
Department of
Agriculture

Marketing and
Regulatory
Programs

Animal and Plant
Health Inspection
Service

Veterinary Services

Revised June 1992
Reprinted March
2001

FOOT-AND-MOUTH DISEASE
EMERGENCY DISEASE GUIDELINES

Prepared by

UNITED STATES
DEPARTMENT OF AGRICULTURE

Animal and Plant Health
Inspection Service

Veterinary Services
Riverdale, Maryland

APHIS - Protecting American Agriculture

An Equal Opportunity Employer

7.7 Disposal - Methods of carcass disposal include burial, burning, and rendering. Many factors must be considered and often other State or Federal agencies have to be consulted before the method of disposal is selected. Upon recommendation of the State or Federal agencies, the EPS Chief Staff Veterinarian may consider other disposal methods.

7.7.1 Burial - Burying is the preferred method of disposal and should be used whenever practical. Digging the disposal trench should begin as soon as possible after confirmation of the diagnosis. The site should be on the affected premises or as close to the premises as topography permits. When selecting a burial site, consideration should be given to underground cables, water or gas lines, septic tanks, water wells, etc. If possible, an area away from public view should be chosen. Disposal methods must be approved by the READEO environmental quality officer. The burial of a large number of animals will come under the jurisdiction of State and Federal environmental laws and regulations. Necessary permits and pre-clearance to proceed with the burial must be obtained.

a. Information should be supplied to the READEO Contract Officer concerning trench dimensions, cubic yards of material to be moved, price per yard, charges for blasting or other special techniques, and provision for trench filling and possibly refilling several weeks later after the carcass and fill dirt has settled. This information is needed for drawing up a contract for heavy equipment use.

b. Trench dimensions. A burial trench should be ar least 7 feet wide and 9 feet deep. At this depth, 14 square feet of floor space is required for each bovine carcass (5 mature hogs or sheep equal one bovine carcass). If equipment and soil conditions permit, it may be desirable to dig deeper (12 to 20 feet) and wider trenches. For every additional 3 feet in depth, the number of animals per 14 square feet of floor space can be doubled.

c. Disposal of feed, milk, manure, and miscellaneous items. Contaminated manure, feed, small volume of milk, and other items may be placed in the trench with the carcasses and covered with at least 6 feet of soil or disposed of by other approved methods. Do not pack the trench. Decomposition and gas formation will crack a tightly packed trench causing it to bubble and leak fluids.

d. Designated burial site. If a suitable site is unavailable on the infected premises, the carcasses should be transported in biologically secure transport vehicles to a pre-approved designated burial site. The site should be inaccessible to animals, removed from populated areas, not used for agricultural purposes, clearly marked, and properly protected. Disposing of carcasses in a designated site assumes the existence of an agreement between the USDA and the locality permitting the burial as well as clearance or compliance with existing environmental laws. Arrangements to secure leak proof transport

vehicles must also be made. Guidelines for trench dimensions and burial techniques are as above.

7.7.2 Burning - Burning carcasses is difficult and expensive in terms of labor and materials used. Burning should be used only when burial is not feasible. A high water table, excessive rock conditions, or public health and environmental protection reasons may prevent use of burial as a method of disposal and allow burning instead. A holding pen for confining animals prior to depopulation should be available near the burn site. In some instances, farmyards and existing holding pens may be adapted for this purpose. In other cases, new pens may have to be constructed. Burning a small number of carcasses is feasible on the affected premises if fuel is easily obtainable. Permits and clearance to proceed must be obtained to avoid violating environmental laws.

a. Selection of burn site. Select the burn site with care. It should be a flat area away from public view, and readily accessible to heavy vehicles hauling materials. The fire should be built well away from buildings. hay, straw, or feed stacks, as well as from any overhead electric and telephone cables, and shallow underground pipes or gas mains. The prevailing wind direction should be considered to prevent unnecessary quantities of smoke and objectionable odors from blowing toward farm buildings or across public roads. The fire will burn better if constructed at a right angle to the prevailing wind.

b. Burning procedures. A burning operation consists of elevating the carcasses on a platform constructed of incendiary materials (e.g. wood, coal, straw, old tires, etc.). It will often be difficult to obtain sufficient quantities of suitable incendiary materials. The individual in charge of building the fire must use ingenuity in acquiring materials and putting them to optimum use. Until carcasses are destroyed, the fire should be guarded to avoid dissemination of infected material by predatory animals or birds. The fire will have to be tended and rearranged periodically as it progresses. A small bulldozer or a tractor with a scoop is useful for this purpose. The straw bale platform method of carcass disposal by burning is described.

c. Fuel requirements.

Straw or hay: Allow 3 bales per cattle carcass. Contaminated straw or hay can be used in fire preparation. Additional quantities can be purchased from the farmer or local suppliers.

Heavy timber: Allow 3 pieces (approximately 8 feet long by 1 square foot in cross section) per cattle carcass. Railroad ties or bridge timbers make ideal material. If smaller dimension materials such as fence posts or cord wood are used, proportionately more pieces will be needed.

Old tires: Allow 4 or 5 tires per cattle carcass.

Kindling wood: Allow 50 pounds per cattle carcass. This material may be obtained from wrecking companies, farm wood piles, saw mill slab piles, etc.

Coal: This should be of good quality and in large lumps (6 inches to 8 inches diameter preferable; avoid fine coal). Allow 500 pounds of coal per adult cattle carcass. Proportionately less is required for young stock. When goats, sheep, or swine are burned with cattle, they may be placed on top of the cattle carcasses at the rate of two animals for each cattle carcass without additional fuel. Over this rate, or when goats, sheep, or swine are burned alone, allow 100 pounds of coal per animal.

Liquid fuel. Waste oil, furnace oil, or diesel fuel should be obtained in sufficient quantity to thoroughly soak the other materials before the fire is lighted. A minimum of 1 gallon per cattle carcass (C) is required. A reserve supply of fuel oil should be held in case difficulty in burning is encountered. Caution. DO NOT USE GASOLINE.

Estimation of animals: (Bovine Equivalents)

1 adult cow or bull	= 1 C
5 adult swine	= 1 C
5 adult sheep	= 1 C

Reduce all animals to number of C's

Length of fire: One yard per C (2 pigs, 2 goats, or 2 sheep can be layered on top of each C).

Amount of material per C:

Straw	= 3 bales per C
Heavy timbers (8 ft. long x 1 ft. sq.)	= 3 per C
Kindling wood	= 50 lb. per C
Tires	= 4 per C
Coal	= 500 lb. per C
Fuel oil	= 1 gal. per C

Example:

500 cattle	= 500 C
1,000 swine	= 200 C
700 sheep	= 140 C
Total	840 C

Reduce 840 C by 200 C since 2 swine or 2 sheep carcasses may be added for each cattle carcass without additional fuel. 840 C-200 C = 640 C. Stake out fire line 640 yards long. Line can be divided into 2 or 3 separate lines.

Straw - 3 bales per C	= 1,920 bales
Heavy timber - 3 per C (increase if small timbers are used)	= 1,920 timbers
Kindling wood - 50 lb. per C	= 16 tons
Tires - 4 per C	= 2,560 tons
Coal - 500 lb. per C	= 160 tons
Liquid fuel - 1 gal. per C	= 640 gallons

d. Fire Preparation - (See: Figure 4 - Disposal of Carcasses by Burning) Select a site and stake out the area of the firebed, allowing 3 feet of length for each adult cattle carcass. Lay three rows of straw or hay bales lengthwise along the line of the firebed. Allowing 3 feet run per adult bovine carcass, lay the rows approximately 12 inches apart with 12 inches between each bale in a row. Push loose straw into the space between the bales. Place the large timbers lengthwise on top of each row of straw. Distribute the remaining large and medium-sized timbers across the firebed with 6 to 12 inches of space between timbers. Next, place the old tires and small kindling wood on the firebed. Spread loose straw over the wood and tires. Spread the coal evenly (at the rate of 500 lb. per yard) over the wood and tires to make a level bed. A front-end loader is useful for spreading the coal. Place carcasses on the firebed. Position them on their backs with feet in the air alternately, head to tail. This can best be done with mechanical lifting equipment (front-end loaders, draglines, trenchers) and chains. Place loose straw over the carcasses and stuff into all the spaces between carcasses. Pour or spray liquid fuel (Caution: do not use gasoline) over the pyre with buckets or sprinkling cans. If a pump is available, spray the fuel on. Start the fire along the entire length of the pyre. A torch that will burn for several minutes is recommended for starting the fire.

If weather conditions are favorable, the bulk of the carcasses should burn within 48 hours. It will be necessary to tend the fire, stirring it occasionally, and replacing carcass pieces that drop off. Additional fuel may need to be added. When all the carcasses have been completely burned and the fire has died out, the ashes should be buried and the area cleaned up, graded or plowed, and prepared for seeding.

7.7.3 Rendering - The most economical method of disposing of carcasses is rendering. However, satisfactory rendering plants are not always available. The movement of carcasses to the rendering plant poses some additional risk of spreading the agent.

a. Transport. The collection and transport of carcasses for rendering should be carried out in closed leak-proof vehicles which can be easily cleaned and disinfected. The vehicle should be built in such a way that leakage and aerosol dispersal during transport is prevented. The handling of the carcasses should be kept to a minimum. Following are some guidelines for consideration:

(1) During killing and handling avoid mutilating the carcasses to keep leakage to a minimum.

(2) All trucks hauling carcasses to rendering should be leak proof and covered.

(3) All infected animals and carcasses should be under 24 hr/day security until the pathogens are destroyed. For example, an official should accompany each truck load of carcasses

DISPOSAL OF CARCASSES BY BURNING

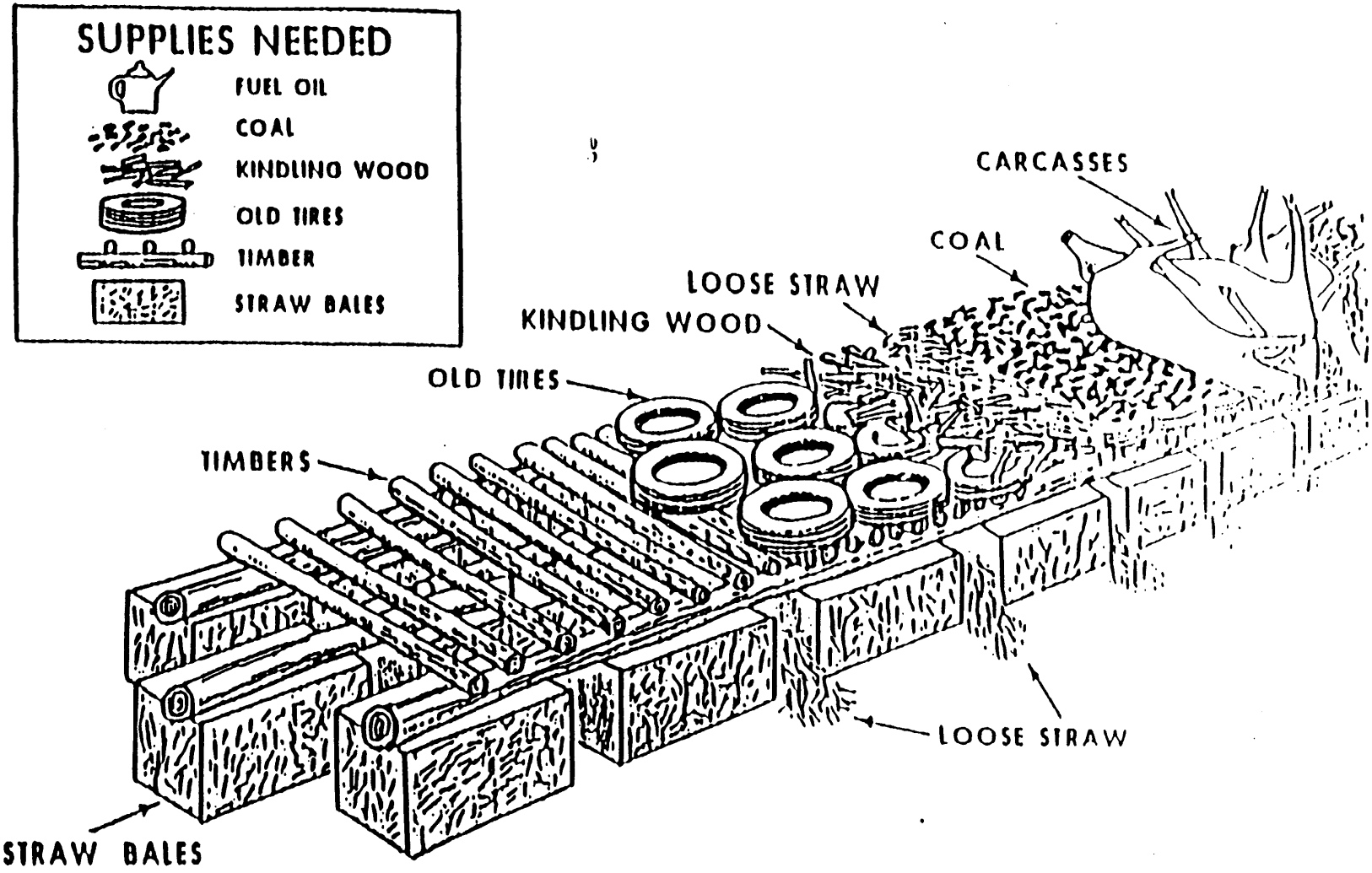


FIGURE 4 - A Diagram for Disposal of Carcasses by Burning

to the renderer and someone should be on duty at the rendering plant as long as any viable pathogens are present. C&D equipment should be available at the rendering plant and all vehicles and equipment should be thoroughly cleaned and disinfected following exposure to infected carcasses.

(4) The rendering plant should be inspected and approved for disposal of the infected and exposed carcasses prior to sending any carcasses to the plant.

(5) The rendering plant should be reasonably accessible and have a larger capacity than would be considered necessary under normal operating conditions to handle the large number of carcasses that would be expected during an emergency.

(6) Care should be taken not to overload the rendering plant and damage the equipment.

(7) The implementation of biosecurity measures to avoid product recontamination should be strictly and uniformly applied. Complete separation between clean and dirty areas must be maintained, and regulatory controls will need to be implemented to monitor the microbiological quality of the rendered product.

7.7.4 Other Selected Methods - Other selected methods of disposal may be recommended by the AVIC, VS, the State Animal Health official, or READEO Director. These methods should be directed to the Deputy Administrator, VS for approval (CFR, Title 9, Part 53.4). An example of an alternative method of disposal would be the use of an incinerator such as at a State Veterinary Diagnostic laboratory, or a diagnostic laboratory at a College of Veterinary Medicine at a University. These methods are apprpriate when the facilities are near the affected premises and the capacity is sufficient for the number of animals involved. Manure, feed, hay and bedding may be composted as an alternative to burying and burning. This method should be done in an area that is not accessible to equine or other susceptible animals.

7.8 Cleaning and Disinfection (C&D) -

7.8.1. Personnel - Personnel requirements will vary depending upon the number of buildings, size of the area, and sanitary conditions of the field. One or more cleaning and disinfection teams of about 10 men each is recommended for disinfecting large farms and stockyards or salebarns. Each team will be supervised by a person known as the "C&D team Chief." The team chief is responsible for securing the necessary equipment and supplies, for scheduling work, and for certifying work accomplished on the affected premises. When more than one team is assigned to a premises, only one team chief should be assigned.

7.8.2 Equipment and Supplies - The C&D chief and team members who will be applying disinfectants will be supplied with protective rubber outfits, including boots, coat, pants, hat, and

April 6, 2004

To: RCRA Division Directors (Regions I-X)
Superfund Division Directors (Regions I-X)
OSWER Office Directors

From: Robert Springer, Director /s/
Office of Solid Waste

Subject: Recommended Interim Practices for Disposal of Potentially Contaminated Chronic Wasting Disease Carcasses and Wastes

We recognize that several States and Regions have had to deal with the disposal of potentially contaminated chronic wasting disease (CWD) carcasses and wastes and that there are several options available for the disposal of these materials, one being disposal in a municipal solid waste landfill. The purpose of this memorandum is to provide States and municipal solid waste landfill facility managers with interim practices for consideration when a determination is made that the wastes are to be disposed of in a municipal solid waste landfill. As a prudent measure, we believe it is appropriate and reasonable for EPA to encourage that the land disposal of this material take place in a manner that minimizes any possibility of releases. I am providing these interim practices now recognizing that many of you must deal with these issues today. However, we will continue to work with you and the States to refine and revise these interim practices.

Several states (CO, KS, MT, MN, NE, NM, OK, SD, UT, WI, WY) and EPA Regions (5, 6, 7, 8) have dealt with the disposal of elk and deer contaminated with CWD. Some States have used high-temperature incineration or alkaline hydrolysis tissue digestion to dispose of contaminated carcasses and other contaminated wastes as these methods are thought to destroy prions, the disease-causing agent. Other States with large numbers of carcasses and heads that need to be handled and a lack of available disposal options (such as alkaline digestion and high-temperature incineration) have used municipal solid waste landfills to dispose of potentially contaminated CWD waste derived from deer or elk herds in areas where CWD is known to occur. Since CWD is transmitted horizontally among deer and elk, it is thought that containing the infectious agent in municipal solid waste landfills would help reduce the spread of the disease. While disposal of potentially contaminated carcasses in municipal solid waste landfills may not be our preferred option, we recognize that exigencies of a particular situation may show this to be the most reasonable option. However, we believe it is prudent to manage the material in a manner that minimizes the potential for releases to the environment. Therefore, the Office of Solid Waste, with input from EPA's Regional Offices, Office of Research and Development and ten States, has developed the attached interim practices that a State or landfill facility manager may consider when disposing of these contaminated wastes in municipal solid waste landfills.

These interim practices capture issues such as: segregation of carcasses, management of leachate, daily cover considerations, and compliance with Part 258. Note that these interim practices do not apply to waste materials that do not contain CWD. The interim practices provide recommendations and do not impose any legally binding requirements nor do they change or substitute for any State, federal, or local statutory or regulatory provision.

Should you have any questions on these interim practices, please contact Thea McManus, Acting Director of the Municipal and Industrial Solid Waste Division at (703) 308-8738, or have your staff contact Paul Cassidy at (703) 308-7281 or Dave Bartenfelder at (703) 308-8629. Thank you for your assistance in promoting the prudent management of these materials.

Attachment

cc: Robbie Roberts
Tom Dunne
Matt Straus
Judy Nelson
Elaine Brenner (OW)
Tom Kennedy (ASTSWMO)
Bethany Grohs (ERT)

Recommended Interim Practices for Disposal of Potentially Contaminated Chronic Wasting Disease Carcasses and Wastes

(1) The municipal solid waste landfill should be 40 CFR Part 258 compliant and have no uncontrolled release from the receiving landfill disposal cell. A composite liner system and leachate collection system is preferable as it will allow for potential future leachate monitoring for prions when appropriate tests are developed. Leachate should be recirculated, where practical, within the animal carcass/contaminated waste disposal cell to remove potential issues associated with discharges to POTWs/Wastewater Treatment Facilities (WWTFs).

(2) A 20-foot base of municipal solid waste should be overlain by 12 inches of absorbent material. The absorbent material should be placed immediately prior to the disposal of the animal carcasses or other contaminated wastes.

(3) Carcasses should be splayed and placed on top of the absorbent material, not to exceed a two carcass-layer thickness. After placement of the carcasses or other contaminated wastes, lime, cement kiln dust, or other similar pH caustic should be added to fill the voids and to minimize fermentation. Immediately following placement of a carcass layer(s)/contaminated wastes, a minimum of 3 feet of municipal solid waste should be applied. At the end of the operating day, a minimum of 12 inches of earthen material should be applied for vector control. No alternative daily cover materials should be allowed.

(3a) As an alternative to (3), carcasses might be splayed and placed in a macro-vault. The macro-vault sequencing should begin close to the final waste elevation to minimize failures due to waste overburden forces. A macro-vault may be created by placement of a geomembrane material in a roll-off box. The geomembrane covers the bottom and sides of the roll-off box. Carcasses or other contaminated wastes are placed within the box. Lime, cement kiln dust, or other similar pH caustic material should be added to the box to fill the voids and to minimize fermentation. The top of the roll-off box should be sealed, to prevent releases, by placement of a geomembrane cover material over the box. The macro-vault is then placed in the municipal solid waste landfill. At the end of the operating day, daily cover or alternative daily cover should be applied. Multiple macro-vault layers (where used) should be aligned perpendicular to the underlying layer and the number of layers should be based on the supportive strength of the macro-vault.

(3b) As an alternative to (3) or (3a), carcasses might be splayed and disposed of in a geomembrane-lined trench within the municipal solid waste landfill. These carcasses and other contaminated wastes should be placed in the trench not to exceed a two carcass-layer thickness. After placement of the carcasses or other contaminated wastes, lime, cement kiln dust, or other similar pH caustic material should be added to fill the voids and to minimize fermentation. After filling the voids, the sides of the geomembrane should be overlapped a minimum of three feet to create a secure trench. After sealing the geomembrane or at the end of the operating day, daily cover or alternative daily cover should be applied.

In addition, the state/local regulatory agency and the owner/operator should consider:

- Taking into account potential settlement and future surface water ponding when determining the number of carcass layers.

- Segregating animal carcass/other contaminated waste disposal areas to the extent possible and identifying the boundaries of the disposal area using GPS or other methods.

- Advancing special notification when carcasses or other contaminated wastes are being brought to the landfill to allow landfill mobilization and preparation time.

- Any disposable materials derived from disposal operations should be concurrently disposed with animal carcasses/other contaminated wastes.

- Recording a notation on the deed to the facility property that provides official notification of animal carcass/other contaminated wastes acceptance in order to avoid future improper/illegal exhumation of these wastes.