

CATASTROPHIC MORTALITY AND ASSOCIATED MATERIAL DISPOSAL

MONOGRAPH No. 002

NEBRASKA DEPARTMENT OF AGRICULTURE
AGRICULTURAL EMERGENCY RESPONSE ACTIONS
LIVESTOCK DISEASE EMERGENCY



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1. SCOPE AND APPLICATION

In the event of a foreign animal disease (FAD) outbreak or other natural or man-made disaster, Nebraska livestock and poultry producers could be faced with the task of large-scale mortality disposal and the disposal of other potentially contaminated materials associated with the FAD response and mitigation. It is likely that counties providing emergency response in these events would be called on to support livestock and poultry producers who, for whatever reason, are not prepared to dispose of animals or associated materials on their property. Counties also will need to address the disposal of depopulated animals, which were temporarily held and cared for by the county during a stop animal movement order.

Currently, the Nebraska Department of Environmental Quality (NDEQ) recommends that any medium or large animal feeding operation prepare a catastrophic mortality disposal plan. To provide contingency plans for producers who cannot dispose of animals on their property, to deal with potential disposal associated with temporarily housed animals and the potential need to dispose of vast numbers of animals, the Nebraska Department of Agriculture (NDA) and NDEQ have requested that local emergency managers identify acceptable methods of mortality disposal for their counties and several sites that could be used for mortality disposal. All catastrophic disposal planning should follow the plans and considerations outlined in this monograph and NDEQ's 2004 guidance document *Catastrophic Animal Mortality Management Plan – Emergency Disposal of Animal Carcasses* (NDEQ 2004).

The purpose of this monograph is to provide functional guidance about providing and assisting in catastrophic mortality disposal associated with a FAD outbreak; however, the plans and considerations are applicable to any catastrophic mortality event. In addition, this monograph addresses the disposal of other materials associated with the response and containment of a FAD. This monograph contains information from and is consistent with current National Animal Health Emergency Management System (NAHEMS) guidelines, as of July 2012.



Local emergency management should use this monograph as a template or reference to develop an operational plan for providing and assisting with catastrophic mortality and associated materials disposal. Operation plans should be consistent with the Local Emergency Operations Plan (LEOP). Several sections of this monograph contain general descriptions of the scope of operations necessary to implement a particular component of disposal. In most cases, these sections were made general so local emergency planners could insert or reference more detailed, county-specific operational details. Examples of these sections include Health and Safety, Communication, Public Information, and Mental Health Services.

In the portions of this monograph dealing with the selection of mortality disposal methods and disposal locations, counties should consider the guidance given, select the appropriate method(s) and locations(s), and then add this county-specific information to the template. Counties should work with NDA and NDEQ to determine appropriate and practical disposal site locations and disposal methods, per NDEQ's publication entitled *Catastrophic Animal Mortality Management Plan – Emergency Disposal of Animal Carcasses* (NDEQ 2004). In the case of identifying specific locations, counties should include detailed contact information for the owners of each selected site, if public lands were not selected.

Counties implementing any portion of this monograph during a FAD response must consider existing regulations and environmental concerns associated with the materials being disposed and the disposal methods selected. In some cases, existing regulations and guidance may be altered to accommodate the emergency nature of the response and the urgent need to isolate potentially infected materials through disposal. NDA and NDEQ should be consulted prior to field implementation of any disposal to verify that the methods do not violate regulations.

2. SUMMARY OF PROCEDURES

This monograph presents the operational considerations and details associated with a county's response to a FAD outbreak. The response and containment efforts will generate large numbers of livestock or poultry mortalities and also associated materials that will require isolation through



disposal or destruction. The operational considerations include identifying methods of disposal and county-managed locations for disposal; suggesting critical personnel and equipment for response, cleaning and disinfection, protecting health and safety, and also determining methods of communication and documentation, providing public information, and mental health support.

Because of the unique aspects of livestock or poultry mortality disposal, it will be addressed twice in this monograph. The first considerations will deal with the general methods accepted in Nebraska and general considerations for selecting disposal sites. This information is provided in Sections 2.1 *Identifying Methods for Mortality Disposal* and 2.2 *Identifying Locations for Mortality Disposal*. Specific information regarding how these tasks should be implemented is presented in Sections 2.33 *Methodology – Carcass Disposal* and Section 2.4.3 *Methodology – Associated Materials Disposal*.

2.1. Identifying Methods for Mortality Disposal

NDEQ, in cooperation with NDA, has developed a *Catastrophic Animal Mortality Management Plan* (NDEQ 2004). NDA and NDEQ strongly encourage county emergency planners to review this document as they select the most appropriate disposal options for their county. It is likely that multiple methods will be required for any given county. This plan discusses five primary means of emergency carcass disposal: burial, landfilling, air curtain incineration, rendering, and composting. The plan presents descriptions of each method and cites advantages, concerns, and other considerations associated with each method. In addition, this plan discusses the possibility of modifying any or all of the five options or developing unique, effective alternatives. When evaluating the alternatives, here are some of the strengths and challenges to consider for each of the disposal methods:

2.1.1. Burial

Burial in permitted municipal solid waste landfill

Strengths:

- Pre-existing and immediately available.
- Previously approved and environmental monitoring in place.



- Handle large quantities of carcasses and waste.

Challenges:

- Operator may not want to sacrifice space for animals.
- Distance to travel is an exposure pathway during transport.

On-site trench/pit burial:

Strengths:

- No movement of carcasses off-site.
- Economic costs are low.
- Logistically simple.
- Discrete disposal away from public exposure.

Challenges:

- Environmental concerns related to leaching to groundwater.
- Persistence of disease agents in ground.
- Slow decomposition of carcasses in subsurface.
- Depressions must be filled over time to cut infiltration.
- May restrict future land use.

2.1.2. Air Curtain Incineration

Strengths:

- Designed to meet regulatory requirements.
- Complete destruction of carcasses and diseases.
- Can be conducted on-site.

Challenges

- Required time to set up.
- Significant fuel requirements.
- Normally would not be allowed under NDEQ air quality regulations. However, during an emergency may be approved by NDEQ on a case-by-case basis. Permit required.

2.1.3. Rendering

Strengths:

- Pre-existing and immediately available.
- Previously approved and environmental monitoring in place.
- Complete destruction of carcasses.

Challenges:

- Operator may not have capacity.
- Operator may not want disease carcasses moving through the rendering facility.



- Distance to travel is an exposure pathway during transport.
- Availability of facilities may be limited

2.1.4. Composting

Strengths:

- No movement of carcasses off-site.
- Economic costs are low.
- Discrete disposal away from public exposure.
- Groundwater not a significant factor.
- Ground can be returned to use within one year.

Challenges:

- Environmental concerns related to surface leaching.
- Persistence of disease agents in ground.
- Access to carbon source needed.
- Piles require continued maintenance.
- Must protect from scavengers

NDEQ's *Catastrophic Animal Mortality Management Plan* contains disposal option consideration checklists in its' Appendices. These checklists will assist counties and producers in the planning process. Maps depicting the location of the state registered landfills and the rendering facilities from the *Catastrophic Animal Mortality Management Plan*, are also included in those Appendices. An extensive review of carcass disposal methods also can be found in NAHEMS Guidelines (NAHEMS 2005) and (National Agriculture Biosecurity Center Consortium 2004).

As disposal options are considered, emergency planners should consider the total scope of an emergency response to a catastrophic livestock or poultry mortality event. For example, the selection of air curtain incineration as a disposal option could severely impact county resources relative to other response areas, such as traffic control or cleaning and disinfection, being delegated to local firefighters who also would be assigned to the incineration effort. Using these resources to implement and oversee carcass incineration may redirect limited county resources from other critical response activities, and divert them from their primary role of protecting the community from fire.



NDEQ and NDA are prepared to work with local emergency planners to review and recommend potential catastrophic animal mortality disposal methods. County emergency managers are encouraged to work with these agencies to develop their catastrophic animal mortality plans, including pre-approved methods and locations for mortality disposal.

2.1.5. Other Factors in Selecting Disposal Methods

Listed below is information relating to several high consequence FAD that could result in a catastrophic mortality disposal situation. This information deals with specific disease agents and their persistence in animal carcasses under different conditions. Important details to note include the effect that temperature and pH have on the longevity of a virus and areas of a carcass where the diseases are found, where they may live the longest or be most commonly found. This information has been adapted from Scott Williams' *Persistence of Disease Agents in Carcasses and Animal Products* (2003).

African Swine Fever

African Swine Fever (ASF) can survive under very harsh conditions. Stability of the disease has been shown for six years at 5°C with no light, 18 months at ambient temperature, and up to a month at 37°C. It is resilient at pH levels from 4 to 10 and residual infection has been observed at pH 3.1 all the way up to pH 13.4. ASF is found in skeletal muscle and bone marrow, as well as unprocessed skins and hides. It is also important to note that blood-sucking insects have been known to spread this virus as well.

Avian Influenza

Highly pathogenic avian influenza virus (HPAIV) is well suited to survive in organic matter for months. It is found in brain tissue, skin, and most visceral organs. Studies have found the virus alive up to six days post-inoculation in the muscles of experimentally infected chickens. HPAIV is stable between pH 5.5 and 8. Avian influenza can also survive for several days in carcasses at ambient temperature and up to 23 days when refrigerated, with 70-80°C (for 30 minutes) being the minimum core temperature to kill HPAIV. In some cases, composting can also inactivate the



virus in carcasses at even lower temperatures. In one field study, various organs of experimentally-infected birds were composted with poultry carcasses in goat manure and straw (1:2:1 volume ratio). No virus was found in the material after 10 days at 40-60°C.

Bovine Spongiform Encephalopathy and Scrapie (prion diseases)

Almost all standard disinfection methods have failed to completely inactivate transmissible spongiform encephalopathy agents (TSEs), including Bovine Spongiform Encephalopathy (BSE) and Scrapie. TSEs have been shown to remain stable through irradiation and UV light exposure, as well as heating for up to an hour at 360°C, exposure to acids and bases, oxidizing agents, and salts. Studies have detected residual Scrapie infection in soil surrounding Scrapie-infected hamster brains buried for three years. BSE has only been found in central nervous system tissue, distal ileum, and bone marrow; however, because other TSEs cover a much wider distribution, all tissues should be treated with great caution. There have been no reports of Scrapie or BSE agents detected in skins, hides, or fibers. Remains of TSE-positive or exposed animals should be disposed of in compliance with all Federal, State, and local regulations. Incineration, alkaline digestion, disposal of materials in appropriate landfills, and burial onsite are the most suitable options.

Classical Swine Fever

Classical Swine Fever Virus (CSFV) can be persistent for weeks in a cool, moist, and protein-rich environment, yet it is still moderately sensitive to certain conditions. For example, UV light has been shown to rapidly inactivate the virus, as well as pH levels below 3 and above 10. CSFV was not affected by low temperatures from 4°C to -80°C for 180 days; however, it was inactivated after 30 minutes at 56°C, 10 minutes at 60°C, five minutes at 70°C, etc. The virus is also vulnerable to rapid changes in temperature such as thawing and refreezing. High levels of this virus can be found in blood and tissues of infected animals.



Foot-and-Mouth Disease

Foot-and-Mouth Disease (FMD) is distributed throughout an infected animal's entire body and can survive for months under the right conditions. If the virus is kept below 4°C, it is stable almost indefinitely, though it is sensitive to humidity below 55-60% and will not survive if its environment is too dry. Rigor mortis of a carcass and the pH changes with which it is associated are able to render FMD inactive in muscle tissue within 24 to 72 hours after death, depending on the species of the animal. Refrigeration causes the formation of acid in a carcass to be suspended, which aids in the longevity of the virus, as it is highly susceptible to changes in pH. Parts of a carcass that show relatively high survivability of FMD include lymph nodes, blood clots, bone marrow, and viscera, as well as hides and skins. The virus was found in dried hides up to eight days old, from salted hides for up to 352 days (salt appears to be highly protective of the virus), and from wool up to 14 days post-contamination.

Glanders

Glanders may be found in urine, saliva, tears, feces, nasal discharges, and pus of infected animals. The bacteria is transmitted mostly via ingestion or contamination of wounds. Glanders is destroyed by prolonged exposure to sunlight (24 hours or more), but remains infective for three to five weeks in damp media, 20-30 days in decomposing material, and for about 20 days in clean water. Unprotected skins of susceptible species are at some risk of infection, but as it is non-spore forming, it is unlikely to survive any liming or acid pickling process.

Newcastle Disease

Newcastle Disease Virus (NDV) is found in most organs and tissues of infected animals and its concentration is dependent on the virulence of the strain and on its tissue tropism. Most evidence suggests the majority of cases of flock infection can be attributed to feeding poultry waste to chickens. Survival of NDV depends on many factors including its initial concentration, the ambient temperature and humidity, and the length of exposure.



Swine Vesicular Disease

Swine Vesicular Disease Virus (SVDV) is stable over a pH range of 2 to 12 and is more resistant to freezing, heating, and desiccation than FMD virus, though it is inactivated at 69°C. Also unlike FMD, SVDV is resistant to the pH changes brought on by rigor mortis. This virus is normally found in the epithelium of the coronary band, the tongue, snout and lips, as well as myocardium, tonsils, and brain stem. It is transmitted primarily through the fluids released from ruptured vesicles.

2.2. Identifying Locations for Mortality Disposal

Once the method(s) for disposal are determined, counties should identify locations where the disposal will occur. Often the selection of disposal methods and locations will occur concurrently. In some cases, due to limited possibilities for locating disposal sites, a county may identify these areas before identifying the disposal method(s). In these cases, the disposal method would be tailored to the possible disposal sites. If private lands are considered for mortality disposal, the county should obtain written use agreements from the landowners. An example of such an agreement is provided in Appendix A.

There are two primary location options for disposal; on-site and off-site. On-site is defined by DEQ as the premises where an animal died **or** on an adjacent property under the ownership and control of the owner or custodian of the dead animals. At sites where on-site disposal is not possible or practical, mortality disposal for the euthanized animals will be carried out at another site. This will require the movement of carcasses off-site for disposal. Cases that could necessitate off-site disposal include, but are not limited to: disposal of animals involved in laboratory research, conditions where there is not adequate land area, sites with shallow water tables, and sites in close proximity to large human populations. If locations requiring emergency mortality disposal are adjacent to each other, consideration should be given to a shared or common disposal area. For more information on disposal considerations and related Nebraska Statutes, refer to *NDEQ's Disposal of Animal Carcasses Environmental Guidance Document* (Appendix C).



The following list presents considerations for selecting an emergency mortality disposal site:

- Public health or environmental protection laws, including fire codes and other regulations. Local authorities must be consulted as to the need for permits as well as for general advice and recommendations.
- Number and type of animals that could be disposed of at the site.
- Potential disposal areas should be located near concentration of livestock, increasing the likelihood that the areas will be within the borders of a quarantine area, in the event of a FAD outbreak.
- The proximity of private lands and human or animal housing areas to potential disposal sites should be considered.
- Isolation from public areas is desirable.
- Areas should allow protection from scavenging animals.
- These areas should not be located in sensitive environments (wetlands).
- If incineration is selected, sites should be isolated from public view.
- The distance between the proposed disposal site and local ground water or surface water. The potential ground water and surface water impact must be considered.
- Proximity of forests, fuel storage or other potential threats in the case that incineration is considered.
- Average weather conditions, including prevailing wind direction, especially in the event that incineration is considered.
- Availability of the type of supplies and equipment necessary for the disposal method selected (e.g., fuel for incineration, carbon sources for composting, or citric acid for the treatment of milk and dairy products and dairy wastewater prior to disposal, etc.).
- Soil type, amount or rocks and hydrologic characteristics.
- Availability of utilities, such as electric (overhead lines), water, sewer, telephone, etc.
- The location of underground or overhead utilities (e.g., pipelines, septic tanks and equipment for water, gas, electricity, telephone, and sewage).
- Roads or open areas that can provide large trucks and other vehicles with access to the disposal site.
- Make sure local bridges and roads can handle traffic and loads of the heavy equipment and truckloads of carcasses.
- If access control is difficult, it may be desirable to post guards at some disposal areas.
- Subsequent use of the disposal area.

NDEQ and NDA are prepared to work with local emergency planners to review and recommend potential catastrophic animal mortality disposal methods. County emergency managers are



encouraged to work with these agencies to develop their catastrophic animal mortality plans, including pre-approved methods for the disposal of mortalities.

Additional disposal strategies, including off-site disposal and temporary carcass storage, may be necessary under certain circumstances (NAHEMS 2005). In some cases, for example, a strategy of off-site disposal may be necessitated by climate (e.g., accessibility concerns), high animal population densities, or the presence of wild animals (e.g., coyotes or feral pigs) that can spread disease. In other cases, carcasses or materials may need to be stored temporarily until conditions are more amenable to disposal activities (e.g., until the threat of a disease agent is reduced or until premises are more accessible).

2.3. Mortality Disposal

The following information identifies the personnel, equipment, and other supporting services that may be necessary to properly dispose of animal mortalities in an emergency situation.

2.3.1. Personnel

Two types of personnel are needed to implement a mortality disposal action. Specially trained workers will be needed to operate heavy machinery and general laborers will be needed to support the heavy machinery operators. Some members of a mortality disposal crew will require training in equipment and personal cleaning and disinfection.

Possible organizations that could be used for support include: private contractors (heavy machinery operators), fire department, county roads, public works department, Nebraska Department of Roads, Nebraska National Guard, and the Game and Parks Commission. Counties also can access citizen corps or other volunteer organizations, as appropriate. If these groups are utilized, the county attorney should evaluate the volunteers' liability relative to assisting the county with the response to a livestock or poultry emergency. Every effort should be made to limit or remove associated liabilities for volunteers.



Personnel will be assigned to mortality disposal sites for shifts with lengths determined by the Planning and Operations Sections. In most cases, these workers will need to be provided food, water, and sanitary facilities.

2.3.2. Equipment

The following list of equipment could be used for mortality disposal:

- Heavy machinery:
 - Excavators and backhoes
 - Bulldozers
 - Front-end loaders
 - Forklifts
 - Tractors/trailers
 - Dump trucks
 - Fire trucks (incineration)
 - Roll-offs
 - Cranes
 - Chains, hooks, shovels and cargo nets
- Lighting: Lighting should provide general area illumination for personnel. With any lighting system, it will be necessary to provide electricity, either with batteries, generators, or drop service from power lines. The use of a drop service will require coordination with the local power company.
- Communications: Each mortality disposal team leader should be provided a means of communication with incident command (IC). Generally, this will consist of portable radios tied into the IC's frequency. Selection of radios should consider local topographic and cultural interferences that could negatively impact transmission and reception. If line-of-sight or distance becomes a limiting factor, the use of portable antennas or repeater towers may be necessary. In some cases, pagers, cellular phones, citizen band radios, or other devices will be appropriate. Whichever system is chosen, it must be compatible with other systems used in the Unified Command (UC), and it must have the bandwidth or capacity to function effectively during an emergency.
- Biosecurity: Portable showers, sprayers, boot washes, personnel protective equipment (PPE) such as disposable coveralls and other associated biosecurity aids should be provided to each mortality disposal team. Since team members will be working in the most contaminated environments, they should implement some level of cleaning and disinfection of personnel and equipment even between disposal sites, but especially when leaving one site and exiting the quarantine area. (See Monograph No. 004 *Cleaning and Disinfection*.)



If carcasses need to be moved off-site, they should be transported in leak-proof containers that are covered. This is necessary to prevent material or fluid harboring any virus or bacteria from exiting the transport container during movement. The leak-proof character of a container can be enhanced by lining the container with plastic sheeting and then placing four to six inches of absorbent material (sawdust, kitty litter, sand, etc.) on top of the liner. As the container is loaded, sufficient space should be left in the container to allow carcass expansion, especially in warmer temperatures. Every effort should be made to avoid puncturing the body cavity of carcasses as they are handled and loaded into the container. This will minimize the release of body fluids.

Personnel transporting the carcasses should have sufficient disinfectant to clean up small spills of contaminated material that may be released during transport. Carcass transport vehicles should be decontaminated and disinfected before they leave the infected premises and after unloading the carcasses. These topics are addressed in detail in Monograph No. 004 *Cleaning and Disinfection*.

2.3.3. Methodology – Carcass Disposal

Specific methodologies for disposal by burial, incineration, composting, and rendering are provided in NDEQ 2004.

In cases where conventional on-site disposal methods (e.g., burial or incineration) are deemed infeasible, plans should be made for the safe, efficient transfer of carcasses and material to another site for disposal. Examples of situations in which off-site disposal may be considered include the following (from NAHEMS 2005):

- Infectious material from laboratories in need of disposal and on-site disposal facilities are limited or unavailable.
- On-site constraints, such as insufficient space, unsuitable soil, a high water table, or seasonal conditions, make on-site disposal infeasible.
- All on-site locations are too close to areas of human habitation.
- Carcasses can be landfilled or rendered off-site more efficiently than they can be disposed of on the premises.



When transporting contaminated material from affected premises to off-site locations, special procedures must be followed to prevent the spread of disease agents. Such procedures include the following (NAHEMS, 2005):

- Prior to loading, carcasses should be sprayed thoroughly with a disinfectant appropriate for the pathogen of concern.
- Infected material should be transported in a large-capacity vehicle (e.g., truck or dumpster) that is leak-proof or that has been made leak-proof by caulking the spaces around the tailgate and any other points of access via the side walls.
- The truck box or dumpster must be lined with a tough (3 mil. or more) disposable polyethylene plastic sheet and sealed at the top. The plastic sheet must be large enough to cover the carcasses and to be secured to the sides and ends of the box or dumpster. A layer of absorbent material (e.g., wood shavings or sawdust) should be placed on top of the plastic liner to prevent punctures.
- The bottom of the container must have a layer of wood shavings, sawdust, hay or straw that is at least one foot thick to absorb fluids, if there is no waterproof barrier below the absorbent material.
- The handling of carcasses should be kept to a minimum.
- Carcasses must be loaded into the truck box or dumpster carefully to avoid tearing the plastic lining.
- In loading the vehicle, ample space must be left for the expansion of carcasses. At least two feet (~61 cm) of space – depending on the air temperature and the distance to be traveled – should be left between the carcasses and the top, sides, and ends of the truck box or dumpster. *To minimize leakage, carcasses should not be opened before loading.*
- After the carcasses are loaded, they must be sprayed with an appropriate disinfectant.
- After the carcasses have been sprayed with disinfectant, they should be covered with the plastic sheet, which should be attached to the sides and end of the truck box or dumpster in such a manner as to prevent leakage (double-sided tape may be used).
- The top of the plastic sheet must be sprayed with a disinfectant.
- After the top of the plastic sheet has been sprayed with disinfectant, a heavy tarp must be put over the entire container and secured.
- While the carcasses are being transported, speeds must be kept to a minimum to decrease the risk of spread of the disease agent en route to the disposal site.
- The vehicle operator must observe biosecurity measures upon entering and leaving the premises. Upon leaving the premises, the vehicle must be cleaned and disinfected.
- After the carcasses are unloaded, all vehicles must be cleaned and disinfected before they leave the disposal site.



- Vehicles used for transporting carcasses from an infected premise to an off-site disposal location should not be moved to an unaffected premise during the course of the outbreak.

For biosecurity reasons, carcass transport vehicles must be accompanied by one or more persons trained in biosecurity, as designated by the IC. The designated representative(s) should bring an appropriate disinfectant and liquid-absorbing material in addition to other tools or equipment needed to clean up any spills occurring on the way to the destination.

All vehicles, personnel, and equipment must be cleaned and disinfected before they leave an infected premise and again after infected materials have been unloaded at the disposal site. Appropriate cleaning and disinfection (C&D) procedures must be followed for all personnel, vehicles, and equipment (See Monograph No. 004 *Cleaning and Disinfection*).

If prompt carcass disposal is not possible, carcasses and other items waiting disposal should be secured to prevent unauthorized access and potential disease spread to susceptible species. Disease transmission can occur via humans, domestic pets, wild animals, birds, fomites (inanimate objects or materials on which disease-producing agents may be conveyed), and other disease vectors, such as insects and vermin. Possible options for temporary storage include piling carcasses in a closed building, piling the carcasses outdoors, spraying them thoroughly with an appropriate disinfectant for the pathogen, and covering them securely with a tarpaulin and using earth-moving equipment to arrange the carcasses in one or more piles and then to cover them with at least three feet of soil (NAHEMS 2005). Control measures for insects and other fomites and vectors also should be considered for all of these options. A security guard on duty might prevent unwanted dissemination of carcasses and parts. Methods should be put in place to discourage scavengers from entering the temporary storage areas.

Disposal sites should be inspected regularly after closure to detect seepage, disturbance, or other problems. NDEQ and NDA will determine disposal area closure requirements. If problems are noted, appropriate action should be taken (e.g., the building of diversion banks, ditches, or covering exposed materials). The overall objective is to allow the site to return as much as possible to its original contour and condition.



Where burial is used, the soil covering will probably need to be replenished periodically during the first year as the carcasses decompose and the soil settles. Settlement depressions should be avoided because they can collect surface water and increase percolation through the burial site and into groundwater.

Before permitting the restocking of the premise, the disposal site should be re-inspected to detect any possible biological or physical risk to people or animals. Additional inspections should occur as necessary for several months following site closure. Because the burial site is a potentially contaminated area, a security fence that excludes people and animals should be maintained for one year.

2.4. Associated Material Disposal

The following information identifies the personnel, equipment and other supporting services that may be necessary to properly dispose of materials associated with a FAD response and containment activity.

2.4.1. Personnel

Two types of personnel are needed to implement disposal of associated materials. Specially trained workers will be needed to deal with on-farm materials, such as manure, dairy wastes, and other associated materials addressed in Section 2.4.3. In most cases, producers or farm operators will provide this expertise. General laborers will be needed to support the producers, farm operators, or other trained responders. Some members of an associated material disposal crew will require training in equipment and personal C&D.

Possible organizations that could be used for support include: producers, private contractors (heavy machinery operators), fire department, county roads, public works department, Nebraska Department of Roads, Nebraska National Guard, and the Game and Parks Commission. Counties also can access citizen corps or other volunteer organizations, as appropriate. If these groups are utilized, the county attorney should evaluate the volunteers' liability relative to



assisting the county with the response to a livestock or poultry emergency. Every effort should be made to limit or remove associated liabilities for volunteers.

Personnel will be assigned to associated material disposal sites on an as-needed basis and generally a single assignment will not span an entire day. Actual task-times will be determined by the Planning and Operations Sections.

2.4.2. Equipment

The following list of equipment could be used for associated material disposal:

- Containers: Large volume polyethylene tote, metal or plastic 55-gallon drums, cardboard or plastic 30-gallon drums for PPE disposal, 30- to 85-gallon trash bags (≥ 5 mil. thick).
- Lighting: Lighting should provide general area illumination for personnel. With any lighting system, it will be necessary to provide electricity, either with batteries, generators, or drop service from power lines. The use of a drop service will require coordination with the local power company.
- Communications: Each disposal team leader should be provided a means of communication with IC. Generally, this will consist of portable radios tied into the IC's frequency. Selection of radios should consider local topographic and cultural interferences that could negatively impact transmission and reception. If line-of-sight or distance becomes a limiting factor, the use of portable antennas or repeater towers may be necessary. In some cases, pagers, cellular phones, citizen band radios, or other devices will be appropriate. Whichever system is chosen, it must be compatible with other systems used in the UC, and it must have the bandwidth or capacity to function effectively during an emergency.
- Biosecurity: Portable showers, sprayers, boot washes, PPE, and other associated biosecurity aids should be provided to each disposal team. Since they will be working in potentially contaminated environments, they should implement some level of cleaning and disinfection of personnel and equipment even between disposal sites, but especially when leaving one site and exiting the quarantine area. (See Monograph No. 004 *Cleaning and Disinfection.*)
- Personnel Protective Equipment (PPE): Water, hard hat, safety glasses or face shield, rubber boots, rain suit (jacket and coveralls), cotton overalls or disposable coveralls, disposable synthetic impermeable under gloves (nitrile, latex, etc.), disposable synthetic impermeable over gloves (nitrile, rubber, etc.), heavy-duty over gloves (cotton or leather), boot tray or bucket, one to two gallon hand-operated pressure sprayer, short-handled scrubbing brushes, and heavy duty plastic garbage bags.
- Cleaning equipment: Vacuum cleaner, water, high- and low-pressure sprayer, power or fuel for sprayer, plastic sheeting (> 2 mil thick), long-handled scrubbing brushes,



sponges, buckets (pet wash), towels (disposable or cotton), heavy duty plastic garbage bags, berming material (e.g., 4x4s, sand, sand tubes, sand bags, etc.), framing materials to build containment structures, sump pump and power supply, and drums or plastic totes to contain spent cleaning and disinfection fluids.

- Disinfectants: The choice of disinfectants will depend on the particular disease being addressed. State or federal veterinarians could be consulted during the local response planning process to identify specific disinfectants that could be used. Disinfectants can range from dilute solutions of common household products, such as bleach or vinegar to commercially available disinfectants. Broad-spectrum disinfectants, such as Virkon® may be an alternative to identifying and stockpiling multiple types of disease-specific disinfectants. In the Australian Veterinary Emergency Plan (Agriculture and Resource Management Council of Australia and New Zealand 2008), many Foreign Animal Diseases (FADs) are reviewed and disease-specific disinfectants are presented. Appendix A briefly describes the disinfectants referenced.

2.4.3. Methodology – Associated Material Disposal

Special disposal requirements may be established by the IC for materials associated with the response and mitigation of a FAD. Such materials may include C&D waste water; disposable PPE; milk; parlor wash water; liquid or slurry manure; eggs and hatchery waste; feed, grain, and straw; silage; dry manure; wool and mohair; and artificial insemination materials (semen and ova). Generally, these materials will be handled differently than carcasses. Much of the following formation is adapted from NAHEMS 2005. In all cases, the IC may implement different or modified versions of the methodologies described below.

2.4.3.1. C&D Waste Water

Spent fluids from C&D should be containerized. These fluids should be considered contaminated and must be treated to inactivate disease agents in such a way as to render the wastewater acceptable for disposal in a sewage system or for discharge onto and infiltration into the soil. Treatment methods will be dictated by the FAD pathogen being addressed. Specific guidance will come from the IC. In most cases, treatment for many of the FAD agents can be accomplished by lowering the fluids pH below 3 or raising it above 11. To be considered a hazardous waste, a liquid must have a pH of ≤ 2 or ≥ 12.5 . Adjustments to pH can be made by adding sufficient citric acid to the wastewater to reduce its pH level to less than 3. If necessary, acidified wastewater can be neutralized (to a pH of ~ 7) through the addition of sodium hydroxide



or sodium bicarbonate. The use of sodium hydroxide could present additional health and safety issues and should be coordinated with the incident's Safety Officer. If the IC dictates that treatment requires elevation of the wastewater's pH to ≥ 10 , sodium bicarbonate or sodium hydroxide can be used. In all cases where pH adjustments are used for treatment, the presence of soil and organic matter in the wastewater will increase its buffering capacity and require considerably greater amounts of pH adjuster. Risk from the wastewater can be further reduced by diluting it and by using larger than normal quantities of water in C&D operations. Treated wastewater may be able to be discharged into a sewer system or onto the soil and allowed to infiltrate. Prior to discharge to a sewer system, the waste water treatment system operator should be contacted to determine if the system has the capabilities to accept and treat the discharge. Discharge onto the soil would require a permit from the NDEQ.

2.4.3.2. Disposable Personal Protective Equipment

Disposable PPE will either be incinerated or sent to a permitted municipal solid waste landfill. Incineration must be performed under a permit issued by the NDEQ and the resultant ash disposed of in a municipal landfill. This material should be placed in an appropriate container and labeled. The container could be plastic trash bags (double bagged); or steel, fiber, or plastic drums. The label should describe the material contained and the accumulation date. The IC will provide specific container and labeling requirements. These containers may require external C&D prior to their disposal, if the incinerator or landfill is outside the infected zone. Materials that are infectious to humans will need to be rendered non-infectious prior to disposal in a municipal landfill.

2.4.3.3. Milk

Milk from the Control Area should be treated to inactivate any disease agents before disposal measures are implemented. Generally, treatment is accomplished by reducing the pH of the milk to less than 3 or increasing it to more than 11, and holding the milk at this level for an hour. Treatment of large volumes of contaminated milk (e.g., at dairy plants or transfer facilities) generally involves disease agent inactivation by heating or pH adjustment. Treated milk may be solidified or bulked using absorbent material and disposed of at a municipal landfill. The landfill



must be contacted in advance to determine its capabilities to receive and solidify or bulk the material. Treated milk may also be accepted at a waste water treatment system. Prior to discharging to a sewer system or delivery at a waste water treatment system, the system operator must be contacted to determine if the system is capable of accepting and treating the material. On a case-by-case basis, the treated milk may be land-applied if approved by NDEQ.

2.4.3.4. Parlor Wash Water and Process Wastewater

Wastewater from dairies and dairy plants contaminated with infected milk must be treated to inactivate disease agents. Treatment should be sufficient to allow the wastewater to be disposed of in a municipal or industrial a sewage system. Treatment can be accomplished by adding sufficient citric acid to the wastewater to reduce its pH level to less than 3. Risk from the wastewater can be further reduced by diluting it and by using larger than normal quantities of water in plant operations. If necessary, acidified wastewater can be neutralized (to a pH of ~7) through the addition of sodium hydroxide or sodium bicarbonate. The wastewater may then be discharged into the sewer system.

2.4.3.5. Liquid and Slurry Manure Storages

Manure in liquid or slurry form and wastewater from animal feeding operations is often stored in lagoons, earthen or concrete in-ground storages and above ground slurry stores before being land applied or brokered. When this material becomes contaminated with a disease pathogen, it will be necessary to isolate or quarantine the lagoon to prevent the spread of the pathogen to other animals. Due to technical difficulties of completely homogenizing the material in a containment and because of the materials high buffer capacity, treatment is generally not an option. The passage of time will eventually result in the destruction of the pathogen.

Adequate fencing is necessary as a part of this isolation or quarantine. Samples from the lagoon should be tested and found free of the disease agent before the material is handled. If insufficient storage is present to contain normal precipitation without causing a release from the storage, liquid or slurry must be pumped into an alternative storage to provide adequate storage for



natural precipitation events. Any additional container also must be isolated or quarantined to prevent the exposure of susceptible animals to the pathogen.

If relatively small volumes of manure are removed from a containment to generate additional storage capacity, the removed material can be handled in a variety of ways. The pH can be adjusted to < 3 or > 11 by the addition of organic acid or alkaline reagents. If this method of handling is chosen, ensure that the material is mixed very thoroughly before taking the sample to test for pH. It is unlikely that a suitable site, free of susceptible livestock or wild species, could be found to spread untreated material from containment.

When composting is being used to dispose of animal carcasses, small quantities of a manure containment's contents can be added to the compost windrows under the guidance of an expert consultant. The containment contents to be added to a compost windrow should be agitated thoroughly to add as much oxygen as possible to the material. Any containment contents added to compost should not be contaminated with wastewater from C&D.

2.4.3.6. Eggs and Hatchery Waste

Contaminated hatching eggs and hatchery waste should be buried with poultry carcasses after verifying that the eggs are no longer viable. Viable eggs and pips must be destroyed through maceration and then disposed of with other hatchery waste. Any live chicks would need to be first euthanized with CO₂ and then disposed of with the other hatchery waste. Landfilling also may be an acceptable option for disposal if transporting the material does not present an unacceptable biosecurity risk.

2.4.3.7. Feed, Grain, Hay and Straw

Feed, grain, hay and straw that may have been contaminated should be burned, composted, or disposed of in a municipal landfill. This includes the parts of the plants or storage piles over which the owner has been walking while removing hay or grain and any materials that could have been in direct contact with infected animals. At least three feet of loose material, two layers of bales or one layer of sacks should be removed from these contact areas and burned or



landfilled (if burned, a permit from the NDEQ may be required). If composting is being used as a disposal method for animal carcasses, include any of these materials in the compost windrows as an additional carbon source.

If it is necessary to salvage feed, grain, hay or straw on a premise where large quantities are stored, the possibility and extent of contamination should be determined through careful study. Contaminated material should be burned, composted, or landfilled. The surfaces of remaining stacks of grain, hay, straw or sacked feed should be fumigated or sprayed thoroughly with an appropriate disinfectant. The disinfection or fumigation of feed and feed ingredients must be conducted with non-toxic (animal or human) or non-residue materials. Generally, the disinfection of feed and feed ingredients may not be cost effective.

2.4.3.8. Silage

Contaminated silage and contaminated portions of silage storages must be removed and destroyed or disinfected. The disinfection or fumigation of feed and feed ingredients must be conducted with non-toxic (animal or human) or non-residue materials. Generally, the disinfection of feed and feed ingredients may not be cost effective.

Contaminated silage can be disposed of in the same manner as feed, grain, hay and straw. Depending on the nature of the disease agent, any remaining silage may need to be sealed off for a period of time before being used as animal feed. In some cases, it may be necessary to plow under field crops that may be contaminated.

2.4.3.9. Manure

Contaminated dry manure may be composted or landfilled. Manure that cannot be composted or stored on-site should be isolated or quarantined to prevent exposure to animals. Depending on the nature of the disease agent and on environmental conditions, manure must remain composted for a period of time and reach specific temperatures in order to inactivate the disease agent.



2.4.3.10. Wool and Mohair

Wool and mohair are difficult to incinerate. Disposal in a permitted municipal landfill is the preferred method of disposal for these materials.

2.4.3.11. Germplasm

If germplasm (e.g., semen or ova) is determined to pose a risk of agent spread, it should be disposed of safely. Pathology incineration or burial is probably the best option. Any potentially contaminated germplasm that is not disposed of can be moved only under USDA permit.

2.5. Health and Safety

General first aid and access to emergency medical services must be provided during all activities associated with any disposal activities. This portion of a response would be coordinated by the Safety Officer, a member of the Command Staff.

Personnel working with contaminated material of carcass disposal should be provided PPE to minimize their exposure to contaminated materials and prevent the spread of the infectious agent. All workers at a disposal site should wear disposable PPE. Unless the infectious agent poses a public health hazard, or stipulated by the IC, respiratory protection may not be necessary. Disposal workers that could come in contact with potentially contaminated liquids should wear waterproof clothing (disposable is preferred, i.e., Tyvek® or Saranex®) or rain suits, with hoods, that can be disinfected and reused. Rubber gloves and rubber boots also will be needed. These items can be disinfected and reused. Under gloves, cotton or nitrile, should be worn under the outer rubber glove. Personnel also should wear hardhats fitted with face shields to protect their faces. In addition, dust masks can be worn to protect the workers' mouths and to prevent ingesting splashed materials.



2.6. Communication

Because of the dynamic nature of an emergency response to a FAD event, the catastrophic mortality disposal plan must be implemented in an effective manner relative to the ever-changing understanding of the nature and extent of the disease in question. In order to allow the mortality disposal teams to quickly respond to changing field conditions, communication between the teams and IC must be maintained through the chain of command. Real-time communication and pre-shift meetings constitute the required communication needed to support catastrophic mortality disposal associated with a FAD outbreak or other natural disaster resulting in large-scale livestock or poultry loss. The disposal of other associated material is generally less time critical and will be handled in a similar fashion.

2.7. Documentation

Throughout the process of catastrophic mortality disposal, it will be necessary for the county to maintain various types of documentation. For indemnity payments or other forms of state or federal reimbursement or cost sharing, it will be necessary to document the resources applied and expended by the county in providing catastrophic mortality disposal. These costs can include the number of animals and pounds of livestock disposed of, labor charges, equipment rentals or purchase costs of expendable equipment or supplies, subcontractor costs, or any other costs associated with providing the mortality disposal services. The collection and evaluation of this information will be the responsibility of the Finance and Administration Section.

Information on the types of materials, disposal methods, and locations of other associated materials also need to be documented. This documentation provides a complete record of the FAD mitigation and will be important in post-event monitoring.

Due to the nature of an emergency response, it is critical to identify personnel who will be responsible for documenting these issues or monitoring and verifying that the needed documentation is being collected by other parties. In some cases, identifying a specific response job that includes documentation will be preferable, especially if personnel will be rotated through



shifts and response jobs. This role and responsibility should be identified and described in a county's LEOP.

Possible actions or items that should be included in a documentation checklist include:

Responder time (hours)	Pounds of livestock or poultry disposed of at a location
Number of responders	Meals provided
Identity of responders	Location of each responder
Mileage to the disposal area	Equipment at each point
Sanitation services provided	Usage time for equipment
Coordinates of disposal areas	Specific quantities of expendables used
Method of disposal	Animal ownership identity
Animal identity	

Documentation also will be essential in order to track vehicles, heavy equipment, and people who exit and enter the disposal area.

Documentation should be maintained in written form. Video, photographs, and tape-recorded messages can be used to supplement the written documentation. Written documentation can be maintained in a logbook format, using documentation worksheets, or a combination of both.

Documentation should be recorded with an ink pen, and any entry errors should have a single line drawn through them with the author's initials and date recorded at one end of the line. If a logbook is used, it should have numbered pages, and the spine should be sewn, making the removal of pages both difficult and obvious. Pages should never be removed from a logbook. Anyone making entries in the logbook should sign and date the bottom of each page. If documentation worksheets are used, the author should sign and date the bottom of each worksheet. Sets of logbooks and worksheets should be assigned to each response task (e.g., traffic control, decontamination/disinfection, mortality disposal, etc.) or a master set of logbooks and sheets can be maintained. Logbooks and worksheets should be assigned unique identification numbers. When the logbooks or a group of worksheets is issued from Planning (response related) or Finance and Administration (cost and time reporting related) to a responder,



the identification numbers of the logbooks and worksheets should be recorded, and the recipient should sign them out in a document tracking log maintained by the issuing Section. This establishes a chain-of-custody for the documentation.

If pictures, video or taped messages or interviews are used to supplement the documentation record, the following information should be documented for each picture, video segment, or audiotaped message or interview:

- Photographer or interviewer
- Subject
- Time
- Date
- Person interviewed (video or audio taped)
- Photo and film roll number
- Direction (pictures and video)
- General weather conditions (e.g., temperature, wind direction, humidity, sky condition, etc.)

2.8. Training

Personnel training will be a critical component of planning to initiate a catastrophic mortality disposal plan associated with a FAD outbreak or other natural livestock or poultry disaster.

Training also will be necessary to deal with the other associated materials that require disposal. Besides the equipment-specific training required for the heavy equipment operators, all personnel associated with disposal will require training in: FAD, biosecurity, the operation and maintenance of C&D equipment, C&D procedures, associated environmental protection issues, and documentation requirements. Training in FAD and biosecurity can be provided at a local level by private, state, or federal veterinarians. Local fire or emergency medical services personnel can provide training relative to C&D. In some counties, military Reserve or National Guard units, and also local health departments can assist with providing C&D training.



2.9. Public Information

Once the FAD response is initiated and quarantines are established, the Public Information Officer (PIO) attached to the Command Staff and NDA's PIO will initiate the county's public information and media plan to inform the local community of the mortality disposal associated with the livestock or poultry emergency response. It is unlikely that disposal of other associated materials will require public information dissemination. This notification may involve public announcements via radio, television, web site, newspaper, and signage announcing that catastrophic animal mortality is occurring, where it is occurring, and why it is necessary. Any information release should be coordinated with state or federal PIOs attached to Area Commands. Local responders should identify and make use of any state or federal pre-prepared information or press releases that could be used in responding to a catastrophic livestock or poultry event.

In general, response workers should be trained to refer any press or other project-specific inquiries to the public relations officers designated for the response.

2.10. Mental Health Services

A response dealing with an outbreak of a FAD can result in the widespread euthanasia of livestock and poultry over a large area. Natural disasters, such as floods or tornadoes, also can result in large-scale poultry or livestock losses. The major differences between the local impacts of a FAD versus a natural disaster are: (1) recovery from a FAD will be protracted, possibly over months; (2) a FAD will generally impact a much greater area; and (3) a FAD is likely to require the widespread euthanasia of entire herds or flocks.

The outbreak of a FAD or other livestock- or poultry-related disaster will generally disrupt family and community routines. In many cases, this will result in a subsequent disruption of family and community dynamics. For example, the mass mortality of herds or flocks could deprive producers of a means to generate income, and it may be perceived as a total loss of their livelihood. The response to a FAD can also have a negative impact on the community



infrastructure (e.g., quarantines). In addition, the local community will be interacting with an influx of strangers and the associated bureaucracies of any state or federal programs or agencies responding to the disaster. These factors can combine to create stressors for responders and the impacted community.

The stress associated with a FAD outbreak, or livestock or poultry natural disaster can result in physical, mental, and behavioral reactions of the responders and the community members. In the United Kingdom, during the 2001 Foot-and-Mouth Disease (FMD) outbreak, situations where producers considered and, in some others, committed suicide was an unanticipated result of the stress. Similarly, personnel involved in mass euthanasia of infected animals can often become depressed.

Generally, anyone associated with a FAD outbreak or livestock or poultry natural disaster will be affected by it. The degree of impact will vary greatly. While, in many cases, the stress will decrease over time, counties should be prepared to offer crisis intervention and counseling, and other forms of support to the community and responders throughout the entire response. In some cases, longer-term assistance will be required.

Providing this type of community and individual response will require specially trained personnel. Local mental health professionals (public and private), hospitals, and state and federal mental health agencies can all provide these personnel. In addition, law enforcement agencies and some volunteer organizations assisting in disasters (VOADs) have personnel trained to provide this support. Examples of VOADs that could assist with providing the mental health component of a FAD or natural livestock or poultry response could include the following: local religious leaders and crisis counselors from VOADs, such as the American Red Cross.

The scope and duration of these services will be tailored to each event. However, it will be critical to incorporate the announcement of these services with the public relations plan and information disseminated to the community. Letting the impacted citizens know what services



are available and how to access them will be imperative for any mental health assistance program to succeed.

It is likely that most counties have a mental health response plan already developed and attached to their LEOP. For these counties, it will not be necessary to go through the planning process again; rather, the existing plan needs to be incorporated into any agricultural appendix to their LEOP.

3. REFERENCES

Agriculture and Resource Management Council of Australia and New Zealand. (2008). AUSVETPLAN 2008 Operational Procedures Manual Cleaning.

NAHEMS. (2005). *Disposal*. United States Department of Agriculture. April, 2005.
National Agriculture Biosecurity Center Consortium. (2004). *Carcass Disposal: A Comprehensive Review*. Carcass Disposal Working Group

NDEQ (2004). Catastrophic Animal Mortality Management Plan – Emergency Disposal of Animal Carcasses. Nebraska Department of Environmental Quality Integrated Waste Management Program and Nebraska Department of Agriculture.

Williams, Scott. (2003). *Persistence of Disease Agents in Carcasses and Animal Products*. Report for Animal Health Australia. Revised December 2003.

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APPENDIX A

EXAMPLE MORTALTY DISPOSAL AGREEMENT



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MORTALITY DISPOSAL AGREEMENT

THIS AGREEMENT is made effective as of this ____ day of _____, 2012, by and between _____ County (“COUNTY”) and _____ (“Landowner”).

WHEREAS, COUNTY, in response to a foreign animal disease (FAD), is required by the State of Nebraska to dispose of livestock or poultry to prevent the spread of a FAD will utilize the land of the Landowner, to permanently dispose of livestock or poultry carcasses, (“DISPOSAL Area”) in _____ County, Nebraska, hereafter referred to as the “Disposal Area.”

WHEREAS, Landowner owns the Storage Area and more particularly described as follows:

Township __, Range __, Sections __, and __ in _____ County, Nebraska.

NOW THEREFORE, the parties hereto agree as follows:

1. Right to dispose of _____ pounds of livestock or poultry mortalities, hereafter known as “carcasses.” These carcasses will be _____ (composted, incinerated or intact) prior to disposal. These carcasses will originate from _____ county. Landowner agrees to cooperate with COUNTY in all reasonable respects to facilitate the disposal of carcasses. COUNTY shall have the right to enter the Disposal Area to construct a burial pit for carcass disposal. Right-of-entry and the right to construct a disposal pit is only provided by the Landowner upon the issuance of a depopulation order or the requirement to dispose of carcasses in response to a FAD, issued by the State of Nebraska and including the county in which the Disposal Area is located.



2. Right to Dispose of Carcasses. COUNTY agrees to cooperate with Landowner in taking all reasonable and necessary actions to ensure that the disposal of carcasses on Landowner's Property shall not unreasonably interfere with customary agricultural land management practices. In return, COUNTY agrees to maintain the Disposal Area in an environmentally protective manner for one year after the closure of the disposal pit.
3. Animal-Specific Information. Upon Landowner's request, COUNTY shall provide to Landowner information concerning the number, volume, weight, species and disease of the carcasses disposed of in the Disposal Area. This request can be made up to one year after the FAD incident has been mitigated in the County housing the Storage Area.
4. Compliance with Environmental Laws. COUNTY agrees to take all action necessary to comply with federal and state environmental laws and regulations. COUNTY warrants that the permanent disposal in the Disposal Area will not violate existing Nebraska regulations governing the FAD response.
5. Successors. The rights and obligations of COUNTY in and to this Agreement shall inure to the benefit of, and bind its successors and assigns. The rights and obligations of Landowner in and to this Agreement shall run with the title to the Landowner's Property and shall accrue to the benefit of, and bind, all persons holding, or claiming to hold, a property interest therein.
6. Term. This Agreement shall continue for a term of five (5) years from the date of this Agreement. This Agreement shall automatically renew for another 5-year period unless written notice is given by either party at least ninety (90) days prior to the expiration of the Agreement. Notwithstanding the foregoing, COUNTY may terminate this Agreement prior to its stated term if (a) it is so directed by the State of Nebraska, or (b) COUNTY delivers notice to Landowner that compliance



with applicable laws, regulations would be unduly burdensome as described in Section 8 hereof.

7. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Nebraska.
8. Right to Deny Use of the Disposal Area. During the term of this Agreement, Landowner may deny COUNTY the right to dispose of carcasses, provided Landowner gives COUNTY written notice of such decision at least one year prior to the date use is denied. During a response to a FAD during the term of this agreement, COUNTY may in its sole discretion decide not to dispose of carcasses in Landowner's Disposal Area. COUNTY may exercise its sole discretion not to dispose of carcasses at the Disposal Area should COUNTY believe that compliance with any applicable laws, regulations, or any other circumstances would make it unduly burdensome to dispose of carcasses in Landowner's Disposal Area.
9. Indemnification of Landowner. COUNTY shall indemnify and hold Landowner harmless from and against all claims, losses, demands and causes of action, including attorneys' fees, court costs/or judgments arising in favor of any person or other legal entity (including COUNTY's employees, agent invitees, contractors, tenants or licensees), provided such claim, loss, demand or cause of action is the result of the negligence or misconduct of COUNTY, its employees, agents, tenants or invitees.
10. Indemnification of COUNTY. Landowner shall indemnify and hold COUNTY harmless from and against all claims, losses, demands and causes of action, including attorneys' fees, court costs/or judgments arising in favor of any person or other legal entity (including COUNTY's employees, agent invitees, contractors, tenants or licensees), provided such claim, loss, demand or cause of



action is the result of the negligence or misconduct of Landowner, or
Landowner's employees, agents, tenants or invitees.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date
first above written.

COUNTY

By: _____
(Title: _____)

LANDOWNER

By: _____
(Print Name) _____

By: _____
Co-owner (if applicable)
(Print Name) _____



APPENDIX B
CATASTOPHIC MORTALITY DISPOSAL PLAN TEMPLATE



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DISPOSAL PLAN TEMPLATE INSTRUCTIONS

- Line 1: List the date this plan was written or revised.
- Line 2: List the name or other identifier associated with the operation. In some instances this may be a unit or building number.
- Line 3: List the person who can answer questions regarding the development or implementation of this plan.
- Line 4: List the street address for the operation that will be served by this plan.
- Line 5: List the telephone number for the person or persons identified in Line 3. Please provide land-line and mobile telephone numbers if possible.
- Lines 6a-6d: Identify each species (type) of livestock or poultry to be disposed of under the guidance of this plan. Provide an estimate of the number of animals, of each type, that will be disposed of according to this plan. Estimate the number of pounds of carcasses to be disposed of, by animal type, according to this plan.
- Lines 7a-7b: Identify the method of disposal selected for the animals listed on lines 6a-6d. In Nebraska, burial, incineration, composting, rendering or disposal at a licensed landfill may be acceptable. If you have questions about appropriate disposal methods, contact your local extension agent, local emergency manager, or the Nebraska Department of Environmental Quality. Once you have decided on a disposal method, use line 7b to present a brief description of what you plan to do and what resources you will need to implement this plan.
- Line 8: Identify the name and telephone numbers of any equipment or supply contractors you plan on using to implement this disposal plan.
- Lines 9a-9b: Describe where you plan to locate the disposal area. On line 9b please list the coordinates (UTM or longitude and latitude) of the four corners of the disposal area. If the area represents an excavation, be sure to clear any utilities prior to selecting the location.
- Line 10: Describe any sensitive environments that are near the disposal area. Consider such things as depth to groundwater, drinking water wells, irrigation wells, proximity of surface water (creeks, ponds, etc.), and drainages that lead into surface water or away from the burial area.
- Line 11: Draw a general map showing major site landmarks such as tree lines, property lines, buildings, pens, manure storages, and the disposal area.





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CATASTROPHIC MORTALITY DISPOSAL PLAN

1. Date Prepared: _____
2. Operation Name: _____
3. Operation Contact: _____
4. Operation Address: _____

-
5. Contact Telephone: _____
 - 6a. Animal Type: _____ Number: _____ Pounds: _____
 - 6b. Animal Type: _____ Number: _____ Pounds: _____
 - 6c. Animal Type: _____ Number: _____ Pounds: _____
 - 6d. Animal Type: _____ Number: _____ Pounds: _____
 - 7a. Disposal Method: _____
 - 7b. Description of Method: _____

-
8. Contractor Contact: _____
 - 9a. Disposal Location: _____
 - 9b. Location Coordinates: _____

-
10. Sensitive Environments: _____
-

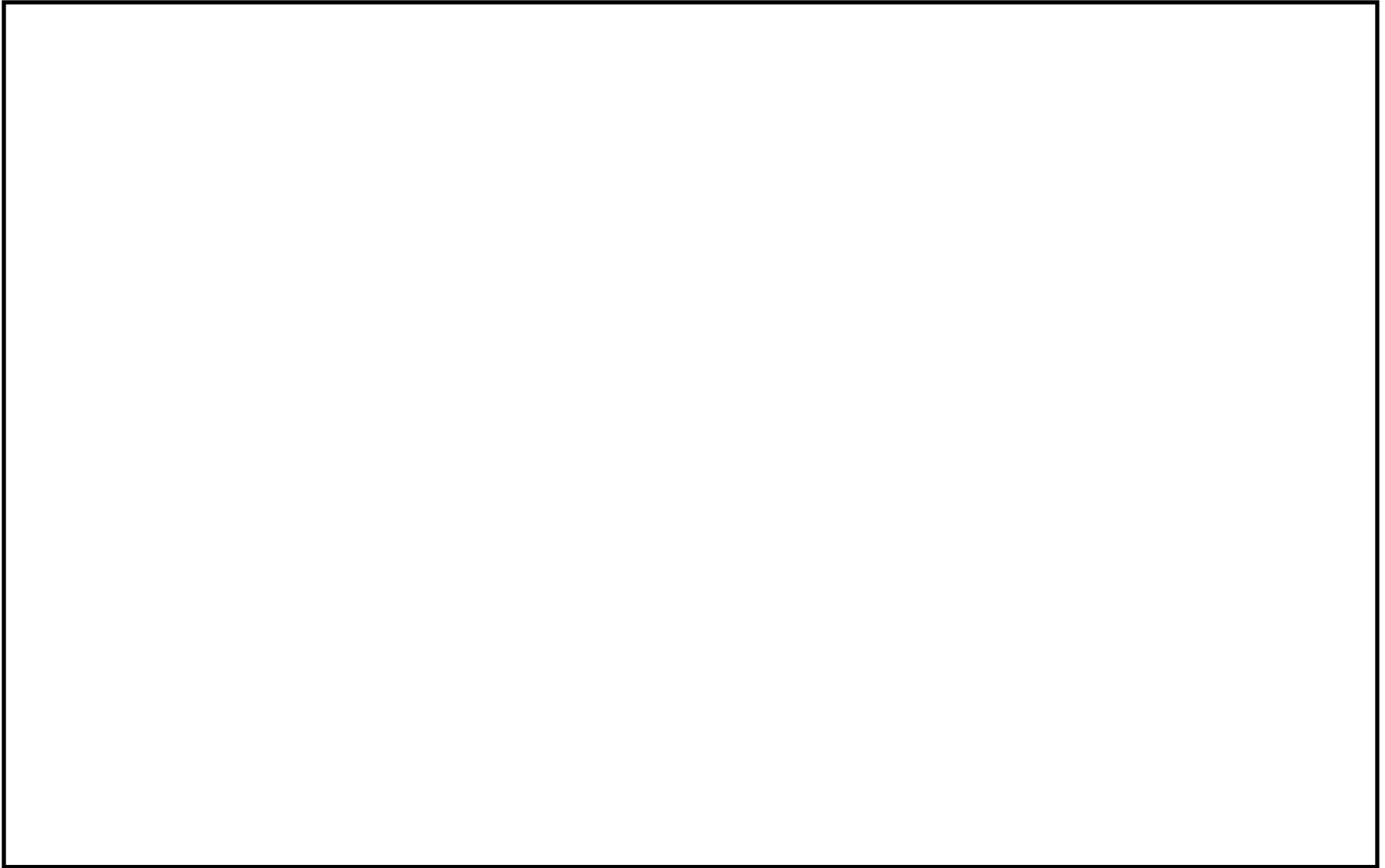


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11. Location Map:

North ↑



APPENDIX C: NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY
DISPOSAL OF ANIMAL CARCASSES ENVIRONMENTAL GUIDANCE
DOCUMENT

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NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

ENVIRONMENTAL GUIDANCE DOCUMENT

06-201

October 2010

Disposal of Animal Carcasses

Numerous animal deaths may result from environmental factors that include floods, storms, heat and cold, or drought conditions. Deaths may result from biological events including chronic wasting disease, bovine spongiform encephalopathy, Foot-and-Mouth disease, anthrax, etc. Deaths may also be attributed to chemical or toxic agents. It may even be necessary to destroy diseased or potentially diseased animals. If animal deaths result from biological events, a licensed veterinarian should be contacted for an evaluation of the mortalities.

If carcasses are managed as the result of an emergency with the potential to impact immediate or long-term animal or public health and safety, the Nebraska Department of Agriculture (NDA), the Nebraska Department of Environmental Quality (NDEQ) and local emergency management authorities should be contacted.

Livestock producers are encouraged to develop their own routine and emergency disposal plans. Statewide planning documents (e.g. the "Catastrophic Animal Mortality Management Plan or CAMMP") have been developed to assist planners and emergency managers. For more information, contact NDEQ or NDA.

Disposal Methods:

Carcasses may be buried, incinerated or composted on the premises where an animal died (on-site) or ***on an adjacent property under the ownership and control of the owner or custodian of the dead animals.*** In this case, carcasses may be transported by the owner or custodian, with restrictions.

Burial – When done in compliance with state and local regulations, burial is an accepted method of disposing of animals and is often the method of choice for catastrophic livestock losses. Burying the animals within thirty-six hours after knowledge of death, and at least four feet below the surface of the ground, dramatically lowers the possibility of spreading a disease.

A state permit to bury on-site or on an adjacent property is not required; nevertheless, there are obligations under rule and statute to protect ground water resources. With this in mind, it is recommended that a disposal site be selected with knowledge of the environmental conditions, including: land topography, depth to ground water, surface water drainage, as well as soil type and depth. Also, separation distances to neighbors, surface water bodies, wells, roads and rights of way should be considered.

Recommended Separation Distances for Burial Sites:

- 5 feet separation from the bottom of the burial pit to ground water;
- 4 feet of compacted cover soil;
- 1,000 feet from public water supply wells, 500 feet from domestic wells and outside of any wellhead protection areas;
- 300 feet from domestic water intakes, streams, creeks, ponds, springs and lakes and at least 100 feet from the edge of a major cut or embankment;
- 500 feet from residences, livestock facilities and adjacent pastures owned or leased by another person;
- 300 feet from a road;
- 500 feet from a secondary highway; and
- 1,000 feet from a primary highway.

Incineration – Disposal by burning requires the use of an incinerator permitted by the NDEQ. In most circumstances, incineration is a difficult disposal method to employ quickly with large numbers of livestock carcasses. Other methods, such as open burning with an Air Curtain Incinerator, would normally not be allowed, however, during an emergency, such methods may be approved by the NDEQ on a case-by-case basis. The NDEQ Air Quality Division must be contacted if any method of incineration or burning is under consideration.

Composting – For this method of disposal to be successful, proper equipment, material and management are required. Please contact the NDA if this method of carcass disposal is to be used.

Rendering Service – Contact a licensed rendering service for the proper transportation of dead animals to a rendering establishment or landfill.

Landfill Disposal – Dead animals may be disposed at any of the permitted municipal solid waste landfills in Nebraska. Due to the potential for individual facility restrictions, arrangements should be made with landfills prior to transport by a licensed rendering service.

Alternate Disposal Methods:

Off-Site Burial - Animal disposal in pits or trenches *not* on-site or on an adjacent property may be appropriate in emergency situations if authorized under the **Nebraska Emergency Management Act**.

NOTE: Nebraska Statue §54-744 limits disposal options to burial, incineration, composting, rendering or landfilling.* Burial, incineration and composting must be performed on-site or on an adjacent property. Restrictions apply. Questions concerning these statutory requirements should be directed to the Nebraska Department of Agriculture. If alternate disposal methods are necessary due to an emergency, contact the Nebraska Department of Agriculture or the Nebraska Department of Environmental Quality for more information.

**Veterinary clinics and laboratories have other options.*

Produced by: Nebraska Department of Environmental Quality, P.O. Box 98922, Lincoln, NE 68509-8922; phone (402) 471-2186. To view this and other information related to our agency, visit our web site at www.deq.state.ne.us. This material is intended for guidance purposes only and is not meant to substitute for applicable Nebraska environmental regulation.