NC DENR HIGHLY PATHOGENIC AVIAN INFLUENZA RECOMMENDATIONS

ABSTRACT

Many livestock and poultry diseases are highly contagious and can be spread by people through contact with contaminated clothing, vehicles, and equipment. The mass mortalities caused by disease outbreaks can negatively impact both surface and groundwater resources. This guidance is offered to help protect animal health, to prevent the spread of disease, and ultimately, to protect North Carolina's environment and natural resources.

August 11, 2015

DENR HIGHLY PATHOGENIC AVIAN INFLUENZA OVERVIEW

The North Carolina Department of Environment and Natural Resources (DENR) has a long-standing history of response to emergency management-related events that impact the environment. Response efforts from the department following hurricanes, tornadoes, and other natural disasters have provided experience and an internal framework that has prepared the agency to assist in a potential outbreak of highly pathogenic avian influenza (HPAI). The United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) reported that 48,091,293 birds have been affected by Highly Pathogenic Avian Influenza (HPAI) across 15 states (223 total detections) to date. The potential economic impact to the State of North Carolina from HPAI is significant and unprecedented. North Carolina's poultry industry contributes $34 billion in total economic activity and supports approximately 109,000 jobs, according to recent testimony from North Carolina Department of Agriculture and Consumer Services (NCDA&CS) State Veterinarian Dr. R. Douglas (or Doug) Meckes at a U. S. House Committee on Agriculture oversight hearing.

DENR staff have been identified across the agency to form an internal HPAI task force to assist NCDA&CS and other state agencies in addressing an HPAI outbreak. Specific guidance was developed in collaboration with NCDA&CS on biosecurity, decontamination, burial/disposal, composting/litter disposal, transport/rendering, public water availability and air quality. DENR does not expect to be involved in depopulation, but its role is to ensure environmentally safe inactivation, transport, and disposal of all infected birds, feed, wastes, and other materials.

In addition to assembling the guidance that is included within this document, DENR staff have established points of contact within the private disposal industry sector, the N.C. Department of Transportation (NC DOT), and other related areas to ensure that the vast disposal and resource needs can be met during an HPAI event. DENR staff traveled to Minnesota and met with representatives from USDA, Minnesota HPAI incident command and the Minnesota Board of Animal Health. This onsite experience, coupled with conference calls with other industry representatives, including Iowa Department of Environment staff, provided the foundation and framework for DENR's Avian Flu Task Force to provide substantive input on the management of a potential outbreak in North Carolina. Preparation by department staff will continue after the attached guidance is submitted to NCDA&CS, with the focus on a proactive mode regarding HPAI response in North Carolina.

The HPAI task force and supporting department staff stand ready to actively participate in this potential state of emergency, which will require additional resources depending on the type of role assigned to staff. At minimum, there will be a need for additional communication equipment (cell phones, laptops, tablets), safety equipment (PPE including N95 respirators), decontamination equipment, and the continued involvement of department and/or division public information officers. If a statewide HPAI impact occurs, HPAI task force members and additional department staff could be called to respond, which would require the redistribution of work assignments.

In conclusion, the goal of this document and ongoing efforts by the HPAI task force is to ensure that, in collaboration with NCDA&CS, North Carolina is prepared to address an outbreak of HPAI in a manner that preserves our current state of environmental quality and public health while also rapidly deactivating the virus to preserve our state's robust poultry industry.

DENR HPAI Team Members

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GUIDANCE FOR BIOSECURITY FOR AVIAN INFLUENZA

Many livestock and poultry diseases are highly contagious and can be spread by people through contact with contaminated clothing, vehicles and equipment. The mass mortalities caused by disease outbreaks can negatively impact both surface and groundwater resources. This guidance is offered to help protect animal health and prevent the spread of disease.

In the event of an outbreak, staff should only enter affected areas with authorization from the established Incident Command Center. The following are general guidelines to be used when visiting affected farms, compost sites and disposal sites. These measures may be updated if the HPAI threat to North Carolina becomes more imminent and the responsibility of DENR staff becomes more defined.

VEHICLES

- Vehicles should be washed on a regular basis, preferably prior to visiting farms and after site visits, especially after being on an affected farm. The interior should be vacuumed and floor mats should be disinfected using a spray disinfectant.
- Vehicles need to be disinfected using only products that have been approved by the EPA for use on Avian Influenza. Tires, fenders and vehicle undercarriages should be sprayed prior to farm site entry and after leaving the site.
- Vehicles entering or exiting sites requiring active decontamination should adhere to the established protocols.
- Park vehicles outside of the "dirty zone." Unless otherwise directed, park vehicles at least 50 feet from any confinement house, mortality composter or burial site. Do not park downwind from building ventilation fans.
- Whenever possible, avoid areas where feed trucks, live haul trucks and rendering trucks may travel or congregate.

PERSONNEL AND EQUIPMENT

- Follow all Incident Command requirements for personal protective equipment.
- Rubber boots or disposable boot covers shall be worn during the entire site visit. Rubber boots should be disinfected prior to leaving the facility.
- Disposable boot covers, along with any gloves or other personal protective equipment, such as Tyvek coveralls, should be disposed of on the farm when possible. If on-site disposal is not available, staff should be equipped with heavy-duty trash bags of a size sufficient to hold the contaminated clothing.
- Hands should be cleaned and sanitized before leaving the site.
- Any sampling devices or tools used while working on the farm or at off-site burial sites should be cleaned and disinfected prior to leaving the site.
- Observe any down times as prescribed by USDA, NCDA&CS, and/or DENR between visits. This time may vary among agencies and depending on the severity of a particular situation.

OTHER BIOSECURITY CONSIDERATIONS

There may be affected areas of the state that warrant the establishment of “clean” and “dirty” travel corridors. Responding staff should become fully aware of this designated status if and when it is put in place, and must seek permissions from the Incident Command.

As in other emergency situations that have occurred in North Carolina, such as hurricane response, it is recommended that responding staff carry the following items in the event of required duty away from home for more than one day at a time: an extra full change of clothing, cell phone and charger, cash or credit cards, and other personal items, including medications.

GUIDANCE FOR DECONTAMINATION ACTIVITIES AT FACILITIES IMPACTED BY AVIAN INFLUENZA

All vehicles and equipment leaving a poultry facility affected by Highly Pathogenic Avian Influenza (HPAI) will require decontamination as described by N.C. Department of Agriculture and Consumer Services procedures. Decontamination (Decon) activities will likely involve wash down with a detergent-water mix followed by a disinfecting agent. Decon flows may contain detergents, surfactants and various disinfecting agents, and, if not properly controlled, could result in negative environmental effects not limited to macroinvertebrate and fish kills, foaming, turbidity and sediment runoff. Public observation of negative environmental effects may create undue concern over the safety and effectiveness of the overall decontamination process. This guidance is designed to minimize potential negative environmental impacts by managing the wastewater flows from Decon activities.

REGULATIONS

The North Carolina rules for both Discharges to Surface Waters (15A NCAC 02H .0106) and Waste Not Discharged to Surface Waters (15A NCAC 02T .0113) deem permitted discharges to surface waters and to the ground surface associated with biological or chemical decontamination activities under the following provisions:

- Activities are performed as a result of an emergency declared by the Governor or the Director of the Division of Emergency Management.
- Activities are conducted by or under the direct supervision of the federal or state on-scene coordinator.
- The Division of Water Resources (DWR) is informed prior to commencement of the discharge from the decontamination activity.
- No ground or surface water standards are contravened. If it is determined that standards are violated, an individual permit may be necessary.

SITING

It is desirable to place the Decon site a significant distance from barns and other siting considerations to reduce the potential for environmental impacts. These considerations include distances from streams, water supply wells, and conduits to surface waters and site slopes. It is recommended that DENR DWR Regional Office staff be contacted to assist in siting Decon stations. Recommended setbacks for Decon stations are:

- 100 feet from intermittent and perennial streams
- 25 feet from ephemeral streams, waterways, and ditches
- 100 feet from any well (with exception of monitoring wells)

Alternative setbacks may be determined based on site-specific criteria.

REDUCTION OF SURFACE RUNOFF FROM DECONTAMINATION ACTIVITIES

Infiltration of Decon water to the soil is preferred over discharge to surface waters. Recommended steps to maximize infiltration to the soil are listed below:

- Minimize soil compaction in infiltration areas by establishing driving routes to and from vehicle Decon areas that do not cross the infiltration areas. Elevate area(s) where vehicles are parked for washing by using gravel or aggregate rock layers, grates, or other mechanical designs. This keeps soils from becoming saturated, which prevents the formation of tire ruts, increases overall site stability, and minimizes the release of solids.
- Consider the above setback requirements and site Decon stations as far as practicable from surface water and wells.
- Recommended activities to facilitate infiltration of Decon flows include:
    - Placement of hay bales, sorbent sleeves, soil swales, or any other physical barrier in preferred pathways (e.g. drainage swales, channels, or roadside ditches that flow to surface water) to reduce the flow of water and allow for maximum infiltration.
    - If a suitable site capable of keeping the Decon water out of surface waters is not available, construction of a temporary catchment may be necessary. The catchment should be large enough to hold, at a minimum, the expected discharge on the most active day. An Authorization to Construct permit is not necessary; however, DWR regional staff should be consulted prior to all Decon activities and construction of temporary catchments. Commonly accepted engineering practices should be implemented.
- Decon activities should not occur during rain events. If Decon activities must occur during rain events, efforts should be taken to reduce runoff of pollutants and wastewater flows.

GUIDANCE FOR BURIAL OF MASS MORTALITY FROM AVIAN INFLUENZA

The goal of these recommendations is to properly dispose of all animal carcasses that result from the response to an avian influenza outbreak in a timely, biosecure, aesthetically acceptable and environmentally responsible manner if disposal and/or burial on farms is the method approved by the state veterinarian.

In the recommendations listed below, the term *burial site* refers to the disposal footprint, not the farm.

RECOMMENDED SITE ASSESSMENT CRITERIA

- Perform adequate assessment of on-site burial areas prior to establishment of burial sites/pits to prevent contamination of groundwater or surface water by either HPAI or conventional pollutants such as dissolved solids, nitrate or ammonia from decaying carcasses.
- Adequate assessments for on-site burial should initially consider County Soil Surveys for determining suitable areas by soil map unit, confirmed by on-site assessments from qualified individuals.
- In cases where the burial site is located in a waste disposal spray field, the burial site is not available for subsequent waste spraying until a new, viable crop is established on the site.
- The burial site should be located so as to minimize stormwater runoff.
- Burial is not permitted in the tiled area of an underdrained field.

RECOMMENDED DEPTH TO SEASONAL HIGH WATER TABLE AND COVER CRITERIA

- (Option 1) The site where dead animals are to be buried should have a separation to the seasonal high water table based on the following soil textural classes: **Soil Group 1**: sandy texture soils- > 36 inches and soil textures coarser than loamy sand may require a greater separation distance to the seasonal high water table; **Soil Group 2:** coarse, loamy and fine loamy texture soils->24 inches; **Soil Group 3**: clayey texture soils->18 inches.
- (Option 2) Burial sites for dead animals should be at least 36 inches above the seasonal high water table. Soil textures coarser than loamy sand may require a greater separation distance to the seasonal high water table.
- There should be at least 36 inches of soil covering any buried animal. This can be interpreted to mean soil mounded over the animals above the adjacent ground level.

RECOMMENDED BUFFERS AND SETBACKS

The burial site should be:

- At least 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- 300 feet from any existing stream or public body of water and at no time within the regulated floodway of any waters of the state.
- 300 feet from any existing public water supply well.
- 100 feet from any other type of existing well.

- The burial site cannot include any portion of a waste lagoon or lagoon wall.

Alternative setbacks may be determined based on site-specific criteria.

RECOMMENDED RECORD KEEPING / POST-BURIAL CRITERIA

- A record of the location of the approved site (GPS latitude and longitude coordinates if available) and the burial history of each burial site, to include the date, species, head count and age, should be kept by the property owner and reported to the local health director, the state veterinarian and the secretary of the Department of Environment and Natural Resources.
- Consider deed notices for burial site locations. The purpose of recording the disposal location is to provide actual and constructive notice to subsequent purchasers of the property described herein and to reduce any risk to public health, safety or the environment from either the improper disturbance of the waste or from development in proximity to the waste.
- A post-disposal environmental assessment should be considered for on-site burial or mounding of more than 250,000 birds (to include a minimum of three monitoring wells, with one well located upgradient of groundwater flow). Surface water sampling may also be considered.

RECOMMENDED COLLECTIVE BURIAL SITES CRITERIA

A collective burial site may be designated to serve multiple farms in the event of a large-scale emergency when individual farm sites are not available. In addition to the siting criteria noted above, in order to establish a collective burial site, it should be constructed with, at a minimum, a 1.25 x 10(-6) cm/sec clay liner at least 18 inches in thickness. In addition, DENR recommends that collective burial sites of more than 250,000 birds be located at least 300 feet from any residential dwelling. Post-disposal assessment as noted above would be recommended for any collective burial site. Due to the potential generation of gases from the decomposition of poultry carcasses, DENR recommends monitoring enclosed buildings, spaces, etc. within 500 feet of the disposal area.

GUIDANCE FOR COMPOSTING OF MASS MORTALITY FROM AVIAN INFLUENZIA

Composting has been used successfully to manage mortality from avian influenza outbreaks in a manner that inactivates the virus. The thermophilic temperatures associated with composting have proven to be effective in the management of the virus on the eastern seaboard and throughout other parts of the U.S. The end result of utilizing the compost process to manage mortality from an HPAI outbreak is the production of a material that can have agronomic value and contributes to soil tilth.

RECOMMENDED SITE ASSESSMENT CRITERIA (OUTDOOR COMPOSTING)

- Perform adequate assessment of outdoor composting areas prior to an HPAI outbreak to prevent contamination of groundwater or surface water by either HPAI or conventional pollutants such as dissolved solids, nitrates or ammonia from decaying carcasses.
- Adequate assessments for outdoor composting areas should initially consider County Soil Surveys for determining suitable areas by soil map unit, confirmed by on-site assessments from qualified individuals.
- The outdoor compost site should be located so as to minimize the effect of stormwater runoff.
- Composting should not be conducted in the tiled area of an underdrained field.

RECOMMENDED BUFFERS AND SETBACKS (OUTDOOR COMPOSTING)

- Compost areas should be at least one foot above the seasonal high water table. Soil textures coarser than loamy sand may require a greater separation distance to the seasonal high water table.
- 100 feet from residences.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 100 feet from an existing well.
- The previous recommended setbacks may not be needed when composting within a barn.

Alternative setbacks may be determined based on site-specific criteria.

RECOMMENDED PROCESS MANAGEMENT CRITERIA

- Adequate carbon material should be available to ensure that a balanced carbon-to-nitrogen ratio can be created. Sources include woodchips, sawdust, litter, bedding material, hay, etc. Carbon sources with particle sizes greater than .5-1 inch should not be considered.

- Construct indoor or outdoor windrows with a 12-15 inch base of carbon material 8-12 feet wide (alternative sizes may be considered).
- Use available equipment to combine carcasses and carbon/litter material together prior to placing it on the 12-15 inch base.
- Windrow construction should prevent carcass exposure.
- Construct windrows to a 4-8 foot height and cap with 12 inches of carbon material.
- Moisture should be added to keep piles within a 40-60 percent moisture range. Leachate from the base of the windrow is indicative of excessive moisture within the windrow and additional carbonaceous material may need to be added. Leachate should not discharge to any surface water body, waterway or ditch.
- Compost should be turned no sooner than what is allowed by USDA requirements for HPAI mortality management. Compost can be moved outdoors in accordance with USDA requirements if indoor composting was utilized initially.

RECOMMENDED MONITORING CRITERIA

- Temperatures at 18 and 36 inch depths should be taken every 25 feet of the windrow to ensure adequate temperatures (130 or above) are being achieved at both depths. Temperatures should be monitored the first week to ensure that thermophilic temperatures (>130 degrees Fahrenheit) are reached and again at day 14, for documentation purposes.
- If elevated temperatures are not reached, the moisture level of the windrows should be measured and possibly corrected.
- If pile temperatures decrease early in the composting process, there may be inadequate oxygen (<5%), requiring the pile to be mixed or aerated.
- Excessive temperatures over 160 degrees Fahrenheit should be closely monitored to prevent spontaneous combustion.
- Calibration of temperature probes should be considered to ensure their accuracy.

RECOMMENDED STORAGE AND LAND APPLICATION OF COMPOST CRITERIA

Composted material that satisfies the above criteria and has been certified by Incident Command may be transported offsite for disposal or land application as a Class B compost product. Class B compost is restricted to distribution for land and mine reclamation, silviculture, and agriculture (on crops not for human consumption). Other beneficial uses may be approved by DENR. The following are recommended setbacks and practices for the storage and land application of compost.

- Compost stockpiles should be at least 100 feet from residences.
- 100 feet from any well.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.

- Land application of compost should be at least 100 feet from residences.
- 100 feet from any well.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- Compost should be applied at no greater than agronomic rates.
- Records should be maintained of dates the compost was removed from the farm, estimated amount of compost removed, and the location of sites where compost was land-applied.

Alternative setbacks may be determined based on site-specific criteria.

RECOMMENDED ADDITIONAL COMPOSTING CONSIDERATIONS

- Further composting of the mortality may be conducted in addition to the USDA APHIS requirements in order to reach a Federal Class A standard. Class A standards for windrow composting include five turning events over a 15-day period where temperatures are at or above 131 degrees Fahrenheit. Additional sampling of the finished product for heavy metals, pathogens, and inert material is required for Class A material. Class A composted materials have much greater distribution options.
- Compost should not be distributed and marketed to the public unless it meets federal Class A standards and the facility is issued a permit by DENR's Division of Water Resources.
- Siting of compost windrows should be considered to ensure they can be accessed by heavy machinery and firefighting equipment.
- Siting locations for storage of carbon materials that are in close proximity to the barn (indoor composting) or the outdoor windrow area should also be considered. Carbon storage locations that allow storing of carbon outside of the potentially quarantined area should be identified to prevent unnecessary Decon of vehicles.
- Analytical testing of finished compost is recommended to ensure agronomic loading rates are not exceeded in land application systems.

GUIDANCE FOR INCINERATION OF MASS MORTALITY FROM AVIAN INFLUENZA

The purpose of this section is to provide guidance on the burning of infected and potentially infected poultry carcasses for the purpose of disposal. While it is recognized that the use of other disposal methods are recommended, there may be technical or logistical limitations associated with these methods such that burning may be discussed as an alternative and may be the only viable option of disposal. Under these circumstances, the Department of Agriculture and Consumer Services will make this determination.

Burning of infected or potentially infected poultry carcasses involves a substantial combustion challenge. The two most significant aspects are the moisture content of the carcass and the limitations of getting air and fuel to the carcass in order to produce effective combustion. By providing the following recommended practices and procedures for burning as an alternative means of disposal, it is anticipated that the air quality impacts can be reduced and minimized.

TRANPORTABLE INCINERATORS

Incineration, using equipment specifically designed for destruction of animal carcasses and the associated infectious disease, provides the most effective control for both disease destruction and air emissions.

The benefits of using an incinerator include:

- Two-stage combustion and control of both fuel and air to the incinerator.
- Minimization of air emissions (relative to any form of open burning).
- Reduction of fuel requirements.
- May allow for the use of air pollution control technologies to control emissions.

There are a number of disadvantages to using incinerators, including:

- Availability and acquisition of the equipment.
- Requirements for setup and site preparation time.
- Access to fuel (such as natural gas).
- The rate of throughput is relatively low.

PERMIT EXEMPTIONS

For the purposes of an HPAI outbreak, where time is of the utmost importance, and where it has been determined that the application of an incinerator is necessary for the control of the disease, the incinerator is exempt from air permitting requirements and the requirements of 15A NCAC 02D .1200. The exemption is allowed under 02D .1201(c)(4) provided it meets the requirements of subparagraphs (A) through (D) of that paragraph. These requirements are:

- The incinerator is located on a farm and is operated by the farm or farm operator.
- The incinerator is used solely for the disposal of animals on the farm where the incinerator is located.
- The incinerator is not charged at a rate that exceeds the design capacity.
- The incinerator meets both visible emission and odor regulations.

In these circumstances, where animals are killed to control HPAI and transportable incinerators are the chosen option for disposal and are located on the farm site, the Division of Air Quality shall deem the incinerators to have met the exemption requirements of 02D .1201(c)(4) provided other regulatory requirements are met.

OPEN BURNING

Open burning should be considered as a last resort for disposal of infected and potentially infected poultry carcasses. If it is the required alternative option, as a practice approved by the Department of Agriculture and Consumer Services, it should be considered agricultural burning as defined under 15A NCAC 02D .1903(b)(5) and permissible without an air quality permit. However, the Division of Air Quality recommends the following practices be observed to improve combustion and minimize other environmental impacts. These practices include:

- Burn only materials required to start and maintain/support combustion.
- Placement/piling of animals in direct contact with the ground should be avoided.
- Commence burn in daylight to take advantage of better daytime dispersal of air pollutants.
- Burn with setbacks whenever possible.
- Follow DENR rules and guidance with regard to ash residue.

GUIDANCE FOR TRANSPORTATION AND RENDERING OF MASS MORTALITY FROM AVIAN INFLUENZA

TRANSPORTATION

DENR's concerns associated with the transport of carcasses off-site are the loss of solids and liquids from containers or trailers. These issues are addressed by the United States Environmental Protection Agency (EPA)[1] and North Carolina Administrative Code, specifically 15A NCAC 13B .0105. That rule makes the hauler responsible for satisfactorily transporting waste in covered and leak-proof containers. The USDA APHIS protocols[2] (listed below) for the containment of pathogens during transport should exceed these requirements.

It is presumed that carcasses will be hauled in roll-off containers and/or trailers. The USDA APHIS procedure for the preparation and loading of the transport container is as follows:

- Seal all holes and cracks in the sides, bottom, and doors of the container.
- Line the bottom and sides of the container with at least one layer of polyethylene, leaving enough to cover the load.
- Place a one-foot depth of wood shavings/absorbent material along the bottom.
- Load disinfectant sprayed on but not saturating carcasses.
- Load to not more than one foot from the top, or maximum load weight, and spray again to contain feathers and virus.
- Fold the liner onto itself and seal with tape.
- Cover the loaded container with a tarp, securing it with tape or tie-downs, followed by a polyethylene sheet, also secured, and a second tarp secured around the top of the container.

*Eggs (not more than ~19,000/40 yd^3 container) should be loaded in the container in this order: lined as above, two feet of sawdust/absorbent material, eggs, one foot of sawdust/absorbent, egg layer, and another foot of sawdust/absorbent; seal and tarp as above.

*Manure, litter, and feed loads are lined, sealed, and tarped as above, but no sawdust/absorbent material is required. All loaded containers need to be inspected prior to disinfection for leaks or holes/punctures prior to departure.

*Polyethylene bags can also be used to hold carcasses, etc. in lined containers.

Equipment must be cleaned and decontaminated prior to exit.

RENDERING

Potential environmental issues associated with the utilization of rendering facilities are primarily related to the transport of carcasses and the potential discharge of wastewater

[1] United States. Environmental Protection Agency. Disposal of Domestic Birds Infected by Avian Influenza – An Overview of Considerations and Options. Publication EPA530-R-06-009. August 11, 2006.

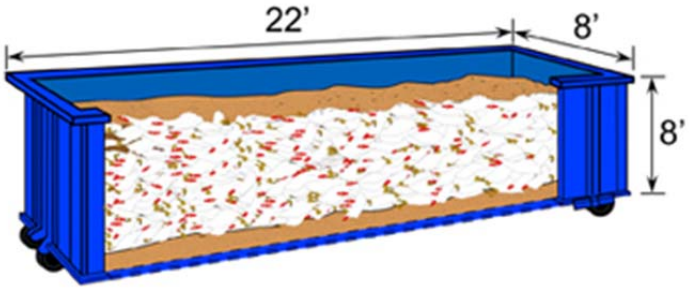
[2] http://www.aphis.usda.gov/emergency_response/tools/transportation/htdocs/sec/load/load0030.html

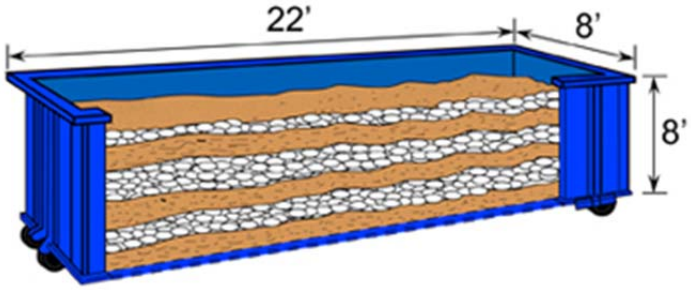
generated from the cleaning and disinfection process. Decontamination will be required for all vehicles exiting rendering facilities that accept mortalities from HPAI-impacted farms.

A recent EPA study[3] focused mainly on the removal of the HPAI virus from the operational appurtenances and structures of the facility versus environmental pollutant containment. This leads us to rely on current best management practices and DENR permitting requirements to prevent or reduce negative environmental impact. It is presumed that any proposed facility is currently operational for non-infected carcasses and is effectively treating and/or discharging for treatment of all wastewater associated with current cleaning procedures. Valley Proteins (VP) has indicated to NCDA[4] that all five of its facilities "…could be used for massive bird disposal should there be a major outbreak which disrupts the operations of a large number of chicken and/or turkey processing plants". VP also stated that these facilities have means for ingress and egress cleaning/disinfection of transport equipment. It is noted that no rendering facilities were utilized in Iowa or Minnesota during their recent outbreaks.

Any facility needs to have, and follow, all required NPDES or non-discharge permits for the wastewater generated in the cleaning and disinfection process, especially if cleaning occurs unconfined. Permits may also be required for truck and equipment storage areas.

TRANSPORT LOADING EXAMPLES





[3] United States. Environmental Protection Agency. Field Study on Cleaning a Rendering Plant Following an FAD Outbreak. Publication EPA 600/R-13/145. September 2013

[4] June 26, 2015 email from Dr. J. Tickel (NCDA) referencing discussions with a representative from Valley Proteins