

Outdoor Mass Carcass Composting Site Selection Considerations



The following outdoor mass carcass composting site selection considerations were developed by partner agencies to help producers respond to large-scale animal mortalities while also protecting human health and Michigan's environmental resources. When making a site selection, consider the items outlined in this document in conjunction with the [2017 USDA Emergency Carcass Management Desk Reference Guide](#)¹ and consult a U.S. Department of Agriculture (USDA) recognized Subject Matter Expert (SME) involved in emergency management and disposal of infected materials.

The site selection determination should be completed by a farm operation prior to an emergency mortality event. This document also assumes users have a general understanding of mapping programs like ArcGIS and Google Earth, USDA Web Soil Survey, and soil mechanics. Resources such as technical service providers, consultants, SMEs, local conservation districts, or other qualified individuals² may be available to help a farm operation plan for and select a site for emergency mass carcass composting.

Adherence to these recommendations does not guarantee compliance with all applicable laws, which include but are not limited to the Bodies of Dead Animals Act, PA 239 of 1982 and Part 115, Solid Waste Management; Part 55, Air Pollution Control; and Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended.

The Michigan Departments of Agriculture and Rural Development (MDARD) and Environment, Great Lakes, and Energy (EGLE) expect any agricultural operation composting livestock due to a disease outbreak to make every reasonable attempt to follow the requirements under the Bodies of Dead Animals Act (BODA), PA 239 of 1982. This includes the utilization of an impermeable liner. If using an impermeable liner is not feasible, this document provides guidance for environmental risk mitigation at the selected composting site. It is important to note that any environmental impacts remain the responsibility of the producer. Additionally, facilities permitted through EGLE should reach out to their local compliance staff for further assistance.

If additional guidance is needed, please contact EGLE at 800-662-9278 and/or MDARD at MDARD-EM-Composting@Michigan.gov.

¹ https://www.aphis.usda.gov/animal_health/carcass/docs/disposal-guide.pdf

² A **qualified individual** is a person who has demonstrated knowledge, skills, experience, or education in soil science, geology, hydrogeology, and engineering to perform the (or all) required task identified in the siting requirements.

Site Selection Preliminary Determination

Composting Site Size and Location Evaluation

- 1) Plan for a minimum of one acre for every 100 tons of organic material, plus additional space for mechanical equipment to effectively and efficiently construct and aerate the compost windrows. Site size(s) will vary. Total organic material per acre depends on multiple variables. For example, the animal/production material may be only carcasses in events not involving disease. For events involving disease, it may include all potentially infected organic materials (e.g., carcasses, manure, feed, eggs, bedding, stored grain, etc.) at the farm operation, and additional carbon material may be needed for proper composting, increasing the tonnage of total organic material per acre. In an actual mass carcass composting response, the planning done prior to the event using this document will be used to finalize the composting plan, which must be approved by a SME trained by USDA's Animal and Plant Health Inspection Services.
- 2) For biosecurity reasons, transport should be kept to a minimum in a disease-related mortality event. The composting area should be as close to the farm operation as possible. It is important to identify sites close to the farm operation that meet the size needs for a mass mortality composting event. If possible, avoid crossing Michigan's State Trunkline Highway System (I-n, US-n, or M-n). Utilizing mapping software, identify the travel distance to those possible locations and the travel routes needed.
- 3) Fields that have not been tiled are preferred for composting. Identify the closest site around the farm operation meeting the size needs of the composting event that does not have drainage tile, if available.
- 4) Sometimes the only potential fields within close proximity to the farm operation have drainage tile. Additional site considerations may be necessary to mitigate risk; consultation with MDARD and EGLE is recommended. If drainage tile is present at the potential site(s) within proximity to the farm operation, utilize mapping software to identify:
 - a. Location of the tile.
 - b. Depth of the tile.
 - c. Tile line outlet.
- 5) If the farm lacks access to a suitable site near the livestock location, efforts to secure access through land purchase, leasing, or agreements with relevant landowners should be explored. If obtaining access remains unfeasible, the farm must explore alternative options for the disposal of on-site animal/production material.

USDA's Natural Resources Conservation Service Web Soil Survey (WSS) Evaluation

- 1) Once a preliminary site has been identified, follow the steps outlined on USDA's Natural Resources Conservation Service Web Soil Survey (WSS) website at [Web Soil Survey \(usda.gov\)](https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)³ to evaluate the site characteristics. For a complete set of instructions on utilizing this tool, visit the [Getting Started With Web Soil Survey](https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soils/getting-started-with-web-soil-survey)⁴ website.
- 2) Once an "Area of Interest" has been created using USDA WSS, identify soil types, Saturated Hydraulic Conductivity (KSAT) values, and other soil classification criteria of the preliminary site, the location must meet the following criteria:
 - a. Have a "no flooding" and "no ponding" rating per WSS.
 - b. Have a KSAT value of less than four inches per hour (less than 28 micrometers/sec).
 - c. Located outside the 100-year floodplain. One source of flood maps is the Federal Emergency Management Agency (FEMA) website at [FEMA Flood Map Service Center](https://msc.fema.gov/portal/home).⁵
- 3) If the preliminary site meets the site conditions outlined in step two under this section, identify the depth to the seasonal high-water table for each soil type utilizing the WSS report. The undrained natural groundwater conditions (drainage tile not present) underneath the compost windrows must meet these criteria:
 - a. For soils with a KSAT value of less than or equal to two inches per hour (less than or equal to 14 micrometers per second).
 - i. Have at least a two-foot separation from the bottom of the compost windrow to the seasonal high-water table.
 - b. For soils with a KSAT value greater than two inches per hour but less than four inches per hour (greater than 14 to 28 micrometers per second).
 - ii. Have at least a four-foot separation from the bottom of the compost windrow to the seasonal high-water table.
- 4) If the preliminary site meets the water table criteria, then identify site slopes utilizing the WSS report.
 - a. The site should be sloped to prevent pooling/ponding around the base of composting windrows, but the slope should not exceed three percent.
 - b. If the site slope exceeds three percent, then additional controls may be needed to prevent the runoff of compost leachate.

³ <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

⁴ <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soils/getting-started-with-web-soil-survey>

⁵ <https://msc.fema.gov/portal/home>

Site Map Creation

- 1) Create a site map utilizing mapping software.
 - a. Using the measure function in the mapping program, identify distances to surface water (e.g., ponds, ditches, wetlands, etc.):
 - i. Composting windrows must be a minimum of 100 feet from surface water, but it is preferred to put them at least 300 feet away from surface water.
 - ii. When the composting site is located between 100 feet but less than 300 feet from surface water, additional runoff controls may be needed to prevent a discharge to surface waters.
 - iii. If the site is sloped toward surface water, additional runoff controls may be needed to prevent a discharge to surface waters regardless of the distance to the surface water.
- 2) Using the Michigan Department of Environment, Great Lakes, and Energy's Water Well Viewer [Water Well Viewer \(state.mi.us\)](http://www.mcgi.state.mi.us/waterwellviewer/)⁶, identify all public and private wells around the preliminary site.
 - a. The site should be 2,000 feet from a Type I or Type IIa well, 800 feet from a Type IIb or Type III well, and 300 feet from both a private and irrigation well.
 - b. If isolation distances cannot be met, please contact the Michigan Department of Agriculture and Rural Development's (MDARD) Emergency Livestock Composting Team at MDARD-EM-Composting@Michigan.gov to determine if using well isolation reduction is possible.
 - c. If the well isolation distances cannot be met or acceptably reduced, one of the following may be required:
 - i. Abandonment of the existing well and installation of a new well.
 - ii. Selection of a different composting site that meets the isolation criteria (see "a" above).
- 3) Identify all non-farm residences and sensitive receptors (such as religious, medical, educational, and nursing facilities) around the site. Preliminary sites should be at least:
 - a. 100 feet from a property line.
 - b. 300 feet from a neighboring residence.
 - c. 500 feet from sensitive receptors.
 - d. If these distances cannot be met, additional efforts should be taken to control odors, runoff, etc., and additional controls may be needed.
- 4) Identify and verify groundwater flow direction at the site. A qualified individual may be needed for this determination.
 - a. Please provide what information was used for this determination.
- 5) Prior to performing the onsite investigation of the site selection parameters listed in this section, the farm operation may submit their preliminary determination to MDARD's Emergency Livestock Composting Team at MDARD-EM-Composting@Michigan.gov for evaluation.

⁶ <https://www.mcgi.state.mi.us/waterwellviewer/>

Onsite Investigation of Preliminary Site Characteristics

This section is to be used by the producer and a qualified individual to verify the site characteristics outlined in the previous Site Selection Preliminary Determination section.

- 1) Perform an onsite soil investigation to validate the site soils and depth to water table classifications.
 - a. Have a minimum of one soil investigation per map unit identified from the WSS report.
 - b. Perform additional soil investigations based on the WSS report, observation of the land features, and the different soil groups within the area to validate site suitability.
 - c. This investigation should be performed by a person trained in identifying soil classifications, depth to groundwater, and perching water table conditions.

- 2) Verify all wells and their locations within the vicinity of the preliminary site.
 - a. Search for evidence of active wells that may not be documented within the specified distances, as determined in the Site Selection Preliminary Determination section under Site Map Creation, step two.
 - b. Abandoned wells within 300 feet must be properly closed by a professional before site work for the composting begins.
 - c. Update the site map if there are any changes.

- 3) Verify all non-farm residences around the site have been identified as well as all sensitive receptors (religious, medical, educational, and nursing facilities) and other sensitive populations.
 - a. Search for any changes in housing that may not be documented on the site map within the specified distances, as defined in the Site Selection Preliminary Determination section under Site Map Creation, step two.
 - b. Update the site map if there are any changes.

- 4) Verify all site setback distances identified in the Site Selection Preliminary Determination section, including tile locations, distances from surface water and wetlands, property lines, neighboring residences, and all sensitive receptors and other sensitive populations.
 - a. Search for any features or changes not visible on the mapping tool.
 - b. Assess the slopes of the field to determine if additional runoff controls will be necessary. Consider consulting with MDARD's Emergency Livestock Composting Team at MDARD-EM-Composting@Michigan.gov to help determine appropriate controls.
 - c. Update the site map if there are any changes.

- 5) Once the site's characteristics have been verified to meet the criteria listed in this guidance and the corresponding site maps have been created, the farm operation should submit the information for the proposed site to MDARD's Emergency Livestock Composting Team at MDARD-EM-Composting@Michigan.gov for review. The review will determine if any additional information or assessments are necessary, such as the installation of wells to establish the flow of the groundwater, or if the site is approved. If approved, the site information should be added to the operation's emergency action plan.

- 6) Some sites with permeable soils may require the installation of groundwater monitoring wells. Permeable soils are defined as soils with a KSAT value of greater than or equal to 1/7 inch per hour (greater than or equal to 1 micrometer per second). This step should be done in consultation with EGLE utilizing an industry professional like a geologist or hydrogeologist. The final well installation plan, which may include water monitoring, should be submitted to MDARD's Emergency Livestock Composting Team at MDARD-EM-Composting@Michigan.gov.
 - a. A minimum of four wells are needed to establish groundwater flow direction: at least one upgradient and two downgradient wells.
 - b. Larger composting sites may require additional wells based on site characteristics and hydrology.