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Maintaining a Closed Landfill - PUB2431

Waste Management Program

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fact sheet

PUB2431

Division of Environmental Quality

Director: Kyra Moore

Permitted solid waste disposal areas (landfills) in Missouri are regulated by the Missouri Department of Natural Resources' Waste Management Program. This guidance document provides a general description of the maintenance landfill owners must conduct after the landfill ceases accepting waste to ensure the landfill does not cause a threat to public safety or the environment.

While closed landfills are not subject to all of the requirements applied to active landfills, owners of closed landfills are responsible for preventing their site from threatening public safety or the environment or causing a public nuisance to those living nearby. If they fail to do so, the owners are liable for any impacts that may result. Whether the current landfill owner is the original owner/operator or someone who purchased the landfill at a later date, this owner is the permit-holder or permittee of the landfill and responsible for routine maintenance of the site, including any associated environmental control systems. The landfill owner must become familiar with the condition of the landfill, and its infrastructure, so problems are caught early and repaired to prevent them from becoming larger, more complex problems or creating off-site impacts. A diligent maintenance schedule throughout the post-closure care period will save time, effort and money in the long run.

Requirements for Post-Closure Care

Both the Missouri Solid Waste Management Law and Regulations and the landfill's approved post-closure care plan dictate the owner's required routine maintenance and care schedule. The post-closure care requirements for sanitary, demolition and utility waste landfills are described in Title XVI, Chapter 260, Sections 200 through 345 (Sections 260.200-260.345) of the **Revised Statutes of Missouri** (<https://revisor.mo.gov/main/OneChapter.aspx?chapter=260>) and in Chapters 2, 3, 4 and 11 in Title 10, Division 80 of **Missouri's Code of State Regulations** (<https://www.sos.mo.gov/adrules/csr/current/10csr/10csr.asp#10-80>).

Landfill maintenance and care activities are also described in the site's post-closure plan. The plan describes the minimum necessary maintenance activities, repair schedules and environmental monitoring required at the site, as well as any approved final land use(s) for the site. If a landfill is sold to a new owner, the new owner may be required to update the post-closure care plan, or at a minimum, comply with and implement actions to meet the terms and conditions of the plan that had been prepared by the previous owner and approved by the Waste Management Program. If the landfill does not have an approved post-closure care plan, this document lists the basic requirements contained in the regulations for conducting maintenance at the landfill. For more site-specific requirements, the owner is directed to contact the Waste Management Program.

Post-Closure Maintenance

Per 10 CSR 80-2.030(4)(A)2.B., post-closure care shall include the performance of the following activities:

1. Maintaining the landfill cap.

It is vital to protect the soil cap by repairing areas of erosion, re-grading the soil and recovering any exposed waste as needed, and establishing and maintaining healthy vegetative cover. This routine maintenance may also include acquiring and hauling additional soil to fill in areas of subsidence and depressions to prevent ponding of water on top of the landfill. Ponding leads to the increased generation of leachate, a liquid created when water comes in contact with the buried solid waste and becomes contaminated. Leachate may seep onto the surface of the ground, especially along the sides of the landfill. If leachate seeps develop on the landfill, these areas should be dug out, repacked with clay, and vegetation re-established over them. Care must be taken to minimize the ponded water infiltrating or seeping into the waste. Any leachate that surfaces must not be allowed to flow off the site or into any bodies of water.

Methane gas, also generated from waste decomposition, may vent through the soil and kill vegetation in patches over the surface of the landfill. To help prevent this, the owner should place additional soil in the location of the dead vegetation, smooth and regrade the area, and reseed the area to reestablish vegetation. Minimizing water infiltration into the fill also helps reduce the generation of methane.

Mowing the vegetative cover on the landfill is a vital step in maintenance. The Waste Management Program recommends mowing the landfill twice a year. This will enable the owner to see when problems with the landfill cap are beginning, which allows simpler and cheaper corrective actions to be taken to address the problem(s). Maintenance activities are much more difficult and costly to complete after the landfill becomes overgrown. Mowing prevents the growth and establishment of woody vegetation (i.e., brush and trees) on the landfill. This woody vegetation may become stressed or killed by methane gas, resulting in pathways where water may infiltrate into the waste below and increase the generation of leachate and methane. Also, tree weakened or killed by methane may be more easily uprooted or blown down during storms, causing increased damage to the landfill cap.

2. Operation and maintenance of any leachate collection or methane gas control system(s) for the landfill.

If a landfill closed with methane or gas control systems in place or was required to install these systems due to problems discovered after the landfill closed, the landfill owner is required to keep the systems operating and in good working condition. By doing so, the owner helps to control the on-site leachate or methane gas and prevent any impact to the public and the environment.

Landfill owners shall inspect leachate collection basins to make certain the banks and berms are structurally sound. They must be mowed and checked for damage caused through age, exposure to the elements, infestation by rodents (such as muskrats, beavers, etc.) or other degradation. If basins fill in with vegetation or sediment, they must be dredged to maintain sufficient storage capacity to contain the leachate generated by the landfill. If the leachate level in the basin rises to within two feet of the top of the berm, the leachate must be pumped and sent to a wastewater treatment facility (if approved by the wastewater treatment facility) or managed in another manner approved by the Waste Management Program.

Leachate collection lines must be checked for leaks or breaks and repaired or replaced as needed. Under no circumstances is leachate allowed to discharge off the landfill property or into streams, creeks or other waters of the state.

Any methane gas extraction or collection systems shall be maintained by the landfill owner so methane generated in the landfill is not allowed to migrate off of the landfill property or pose a threat to occupants of surrounding properties. At a minimum, landfill owners shall inspect the methane extraction system to evaluate its performance and verify the system is preventing methane from leaving the landfill property. It is also very important to check the extraction piping to make certain oxygen is not being drawn into the system. Failure to properly maintain the methane extraction system can lead to endangerment of the public or a subsurface landfill fire.

3. Maintenance, sampling and analysis of any groundwater monitoring or methane gas monitoring wells.

Landfill owners are required to maintain any monitoring systems in place at the landfill when it was closed or any systems installed to address problems discovered after the landfill had closed. In some instances, the owner may be required to install additional methane monitoring wells.

Monitoring wells are potential conduits to shallow sources of groundwater or deep groundwater aquifers. As such, wells must be maintained to prevent inadvertent contamination of groundwater. Landfill owners shall inspect well casings and the area around the wells to determine if any wells may be damaged. Caps, casings and monitoring ports may need to be repaired or replaced as they age or if the fittings become brittle and difficult to remove or open. The wells should be protected from damage by vandalism, mowers or other vehicles, and labeled to make them easy to locate and identify. The Waste Management Program may require any damaged well(s) to be replaced. Therefore, access roads to the wells should be maintained to make repairs to or replacement of the wells simpler and less time-consuming for the landfill owner.

Sampling and analysis of all wells must continue at the required frequency and all results submitted electronically to the Waste Management Program until the program allows the owner to end the monitoring program and abandon the wells. If a well must be replaced or abandoned, the owner shall coordinate these activities with the department's Missouri Geological Survey, Wellhead Protection Section at **573-368-2165 (tel:573-368-2165)**. This will guarantee the wells are managed according to the wellhead protection regulations.

4. Necessary operation or maintenance, or both, of any other environmental control features, (e.g., surface water drainage systems) which are included in the design and operation of the landfill to protect public health and the environment.

Maintaining surface water drainage systems, such as let-down structures and sedimentation basins, is also needed to prevent erosion and off-site impacts. Landfill owners must inspect sedimentation basins to make sure the banks and berms are structurally sound. The basins must be mowed and checked for damage caused through age, exposure to the elements, infestation by rodents (such as muskrats, beavers, etc.) or other degradation. If basins fill in with vegetation or sediment, they must be dredged to maintain sufficient storage capacity to contain surface water run-off from the landfill.

All other control features actively in use at the time of closure shall be maintained until the landfill owner has received written approval from the department to discontinue their use. The department will conduct periodic inspections of the site checking to see if it is maintained to comply with the Missouri Solid Waste Management Law and Regulations. Landfills that ceased accepting waste in the mid- to late 1980s were required to execute an Easement, Notice and Covenant running with the land that grants access to department personnel to conduct inspections to check the condition of the landfill. The easements were filed with the county recorder of deeds to grant continuing access to the property even after a change in landfill ownership.

If the landfill is found to be a source of environmental contamination, a threat to public health or safety, or a nuisance, the landfill owner may be issued a Notice of Violation and be required to address the problems and return the facility to compliance. Depending upon the nature and extent of the problem, the department may use its authority to take enforcement action against an owner when a problem develops at a landfill. The goal of this enforcement action will be to bring the landfill back into compliance, however the Waste Management Program may assess penalties for the violations.

As mentioned earlier, the proposed end use(s) of the landfill property is included in the post-closure care plan and approved by the Waste Management Program. The landfill owner is not allowed to use the property in any manner that interferes with the landfill's approved end use, damages the landfill (or its infrastructure and environmental control systems) or violates any other environmental laws and regulations. In the event post-closure plans were not submitted to or approved by the Waste Management Program, general restrictions apply. For example, any excavation or disturbance of buried waste or the soil cap requires prior Waste Management Program approval. Cultivation of crops is

not allowed, nor is the grazing of livestock. However, growing and cutting hay is allowed. Due to continuing decomposition and subsidence in the waste mass and the generation of methane (and other toxic gases), the Waste Management Program may not allow the construction of enclosed structures on or near a landfill. Before beginning any construction projects on the property, all construction plans must be submitted to, reviewed and approved by the Waste Management Program. Any change to the post-closure land use on a landfill is considered a permit modification. A request to modify the land use from the landfill's approved operations manual or post-closure plan must be submitted to the Waste Management Program and approved before any construction or site work is started or any change is implemented.

The Waste Management Program encourages all landfill owners to become familiar with the requirements for care of their landfills. A **landfill maintenance inspection checklist** ([/document-search/closed-landfill-maintenance-inspection-checklist](#)) is included with this document to guide owners when they check the landfill's condition.

Nothing in this document may be used to implement any enforcement action or levy any penalty unless promulgated by rule under chapter 536 or authorized by statute.

For more information

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