



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Acceptable Uses of a Closed Landfill - PUB2430

Waste Management Program

03/01/2017

fact sheet

PUB2430

Division of Environmental Quality

Director: Kyra Moore

The Waste Management Program (WMP) regulates the operation and maintenance of both actively operating and closed landfills in Missouri. This oversight is necessary due to the potential for landfills, if not properly maintained, to have a negative impact upon public health and safety or the environment. Because of this potential, the WMP is authorized to regulate the use of the permitted landfill property. This fact sheet is written to provide general information to anyone who desires to change the approved post-closure use of their landfill.

Once landfills cease accepting waste, both the landfill owner and operator may be required to perform actions to properly close the landfill. These actions are taken in accordance with the Missouri Solid Waste Management Law and regulations and the landfill's approved closure plan. Closure activities include construction of a composite cap over the waste, consisting of soil and since 1994, a geotextile liner over the waste to reduce the amount of infiltration into the waste below. Vegetation is then established over the soil/geotextile cap and documentation is submitted to the WMP describing locations and depths of waste, the location of the existing environmental control systems and any planned future use of the site. After the landfill owner has filed the approved submittals with the county recorder of deeds, the WMP approves closure of the landfill in writing and the landfill's post-closure period begins.

Once the landfill's post-closure period begins, maintenance, care and activities on the landfill are governed by the Missouri Solid Waste Management Law and regulations and the landfill's approved post-closure care plan. Although more recently, closed landfills were also required to set aside monetary funds for potential problems during a specified time throughout the post-closure care period, those who own landfills are required to maintain and care for their landfills indefinitely. The monetary funds are maintained until the department approves the landfill for completing the post-closure period in which it has been determined that the landfill no longer poses a potential threat to public safety or the environment. The length of this period varies with each landfill and is not easily quantifiable—there are numerous examples of landfills that have caused public safety concerns or environmental problems past the standard 20- or 30-year post-closure care periods.

Under Title 10 of the Code of State Regulations, Division 80, Chapter 2.010 (**10 CSR 80-2.010**), post-closure care is defined as the maintenance and monitoring performed after closure to prevent or minimize existing or potential health hazards, public nuisance or environmental pollution and in accordance with the terms of the landfill's permit and the Missouri Solid Waste Management Law and regulations. Therefore, any proposed reuse of the landfill property must not conflict with the landfill's post-closure care, which is set out in the landfill's post-closure care plan, and the Missouri Solid Waste Management Law and regulations. The WMP has observed numerous landfill sites which were subjected to poorly planned and implemented uses, in some cases creating public safety hazards, resulting in damage to the landfill, and costly corrective actions to repair the damage and prevent recurring problems. In order to prevent conflicts with the landfill's post-closure plan or the Missouri Solid Waste Management Law and regulations and future problems, a change of use proposal must be submitted to the WMP to address the considerations provided below.

Considerations when Planning a Change of Use Proposal

When considering a possible change to a landfill's approved post-closure use, there are numerous variables to consider:

- 1. Protection of the landfill cap.** Any planned reuse of the landfill shall be one that does not damage the landfill's composite cap. Damage to the cap increases infiltration into the waste which in turn increases the generation of decomposition products such as leachate and landfill gas. Therefore, grazing of livestock or cultivation of row crops is not allowed on landfills, but the cultivation and cutting of hay is an approved use.
- 2. Methane gas generation and migration.** Methane and other trace gases are generated during waste decomposition. In low concentrations, methane is explosive and at higher concentrations it may displace oxygen, creating a risk of asphyxiation. Hydrogen sulfide, also generated during decomposition, may cause an asphyxiation risk, as well. Because many variables influence the amount of the gases generated on-site, the distances they may migrate through the soil or nearby utility lines and their accumulation in confined spaces, the WMP is extremely conservative and protective in its review of any landfill reuse proposal. This is to ensure that the proposal does not expose the public to the hazards of these gases. Any proposal for the construction of enclosed structures on the landfill property must ensure that these gases will be controlled and not cause hazards to the occupants of the structures.
- 3. Differential settlement of waste.** Depending upon how much decomposition occurs in the waste, the waste material breaks down and settles at differing rates, creating instability and causing the soil above the waste to settle. This results in the creation of dips and depressions over the surface of the landfill. Because of this occurrence and the potential for the landfill gas hazards identified above, the WMP does not approve the building of any enclosed structures over waste on a landfill. This phenomenon may also impact open structures or utility lines installed over landfills.

4. **Existing environmental monitoring or control systems.** For landfills with environmental monitoring or control systems in place during the post-closure care period, their systems must be protected from access to, interference by or damage from interaction with those using the landfill property. Proposals for reuse of the landfill must include provisions to ensure protection of these systems.

Submission of a Change of Use Proposal

If you are interested in submitting a proposal to amend the approved use of a landfill, the WMP recommends you contact them to review all the plans, files and information available about the landfill property. This will enable you to have a greater knowledge and deeper understanding of the restrictions and limitations that will be placed upon any reuse of the property. Landfills are issued a solid waste disposal area permit when they are constructed. Therefore, the landfill owner is considered the permittee, even after the landfill is closed. Any change an owner makes (or allows to be made) to a closed landfill, that was not included in the approved post-closure plan, is a modification to the landfill's permit. The modification(s) request must be formally submitted by the landfill owner to the WMP and approved prior to making the modification(s) to the permitted property. **10 CSR 80-2.020(4)(A)** includes a list of documents and information required to be submitted to the WMP with a permit modification request. The owner should also be aware that **10 CSR 80- 2.030(3)** prohibits anyone from excavating, disrupting or removing waste from a landfill without prior WMP approval. This requirement applies to both permitted and unpermitted solid waste disposal areas.

The WMP understands the desire for a property to have a sustainable future use. However, a desire to reuse a property which contains a landfill must be tempered with a comprehensive understanding of general landfill decomposition processes and the knowledge of site-specific factors that impact or influence these processes. The final determination of the reuse of a landfill property is governed by the mandate that the reuse be conducted in such a way that protects public health and safety and the environment.

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For more information

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Maintaining a Closed Landfill - PUB2431

Waste Management Program

10/07/2024

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** and in Chapters 2, 3, 4 and 11 in Title 10, Division 80 of **Missouri's Code of State Regulations**.

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**. 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** is included with this document to guide owners when they check the landfill's condition.

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MISSOURI
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Requirements and Considerations When Selling or Buying a Landfill - PUB2429

Waste Management Program

09/29/2021

fact sheet

PUB2429

Division of Environmental Quality

Director: Kyra Moore

Permitted solid waste disposal areas (landfills) in the State of Missouri are regulated by the Missouri Department of Natural Resources' Waste Management Program (WMP). Before selling or buying a landfill, you need to contact WMP to ensure you understand your obligations as a landfill owner in order to comply with state law and regulations, even if the landfill is closed. Contact information for WMP is provided at the end of this document.

When a person who owns property containing a landfill decides to sell the property, the owner is required to take several actions to comply with the Missouri Solid Waste Management Law and regulations. Missouri Revised Statutes, **section 260.213, RSMo** states, "No person may knowingly sell, convey, or transfer title to any property that contains a permitted or unpermitted solid waste disposal site or demolition landfill without disclosing to the buyer early in the negotiation process the existence and location of the site. The seller shall also notify the buyer that he may be assuming liability to the state for any remedial action at the site..." Therefore, the property owner is under a legal obligation to notify any potential buyer of the presence of the landfill on that property to ensure the buyer is aware of the substantial responsibility he or she will be undertaking as the new landfill owner. This law applies regardless of whether the landfill is actively taking waste or has been closed for years; the requirement to disclose never expires. Failure by the seller (or someone acting on his or her behalf) to disclose the landfill's presence and the ramifications of owning it, is a serious violation.

Under Code of State Regulations **10 CSR 80-2.020(4)**, the change in ownership of a landfill is a transfer of the landfill permit from one owner to another owner and thereby considered a modification of that permit. This is also true whether a landfill is actively operating or no longer accepting waste. Therefore, before the property is sold, the current owner and the new owner must notify the WMP, in writing, of their intent to transfer the ownership of the landfill. In addition to the change in ownership notification letter prepared by the seller and prospective

buyer of the landfill, **10 CSR 80-2.020(4)(B)** requires the new owner of certain landfills to submit the following information to WMP for review and approval

- An updated post-closure care plan, per **10 CSR 80-2.030(4)(A)**
- A financial assurance instrument in the amount and form prescribed by the department, per **section 260.205.5(2), RSMo** and **10 CSR 80-2.030(4)(B)**

New owners must contact the WMP to determine which of these submittals apply to the landfill they are purchasing.

If the current owner, or potential buyer of a landfill, is interested in subdividing the permitted area (to sell an unfilled portion), the WMP may require the owner to take certain actions, prior to approving the sale and the transfer of the permit. These actions may include documenting or verifying that no risk to public health and safety or to the environment is being caused by the landfill.

Once the landfill transfer has been approved by the WMP and the sale has taken place, the landfill's solid waste disposal area permit (and all its associated terms and conditions) is transferred to the new owner. The new landfill owner assumes any liability associated with the landfill or any off-site problems caused by it. For example, if the landfill has not been properly closed, the new owner may be required to take certain actions to close the site. These may include the following: adding soil to the landfill cap, establishing vegetation, removing wells in accordance with the regulations or other necessary actions.

Therefore, the WMP recommends the buyer reviews the department's files concerning the landfill prior to purchase. The files provide pertinent information concerning the landfill, such as the location of waste on the property; the location of environmental control systems and gas or groundwater monitoring wells; any monitoring requirements; any history of problems that have occurred at the landfill and past required actions; and/or recommendations for resolving problems on the site, as well as the approved post-closure use of the site. The file review allows the buyer to become more familiar with the landfill and the WMP's expectations of any landfill owner.

To ensure that the public is notified of the presence of any landfill on a piece of property, the regulations require those who own a closed landfill to file a detailed description or licensed surveyor's plat of the landfill's location with the property deed. The description/plat shall include the general types and locations of wastes, depth of waste and any leachate or landfill gas control structures that will have to be operated and maintained. The document must be submitted to the WMP for approval then filed with the county recorder of deeds. Once the plat is approved and filed with the county recorder, the legal requirement is satisfied and not required for any subsequent landfill owners. If a survey plat has not already been filed on a

landfill by the previous owner, this requirement will be passed along to the current owner.

For landfills permitted prior to Jan. 1, 1987, and operating after Jan. 1, 1989, the regulations require that the landfill owner prepare an easement, notice and covenant running with the land. The easement, notice and covenant shall be submitted to the WMP for approval and signature; then the approved and signed document shall be filed with the county recorder of deeds. The easement grants the department access to the property to complete work specified in the closure plan, to monitor or maintain the landfill or take remedial action during the post-closure period. This access runs with the property itself, regardless of a change in property ownership. If an easement has not already been filed on one of these landfills by the previous owner, this requirement will also be conveyed to the current owner.

Landfill owners are required to routinely conduct maintenance activities at their landfills to comply with the approved post-closure care plan and the Missouri Solid Waste Management Law and regulations regarding post-closure care. The post-closure plan describes and lists necessary maintenance activities, repair schedules and environmental monitoring required at the site and lists the approved land uses. If a new owner of a landfill was not required to update the post-closure care plan, that owner must comply with and implement actions to meet the terms and conditions of the previously approved plan. If the landfill does not have an approved post-closure care plan, the WMP will provide guidance regarding the required maintenance activities.

The landfill must be maintained to prevent it from negatively impacting the environment or the public health and safety of those who live near the landfill. If the landfill is found to be the source of or contribute to these negative impacts, the landfill owner shall be required to address the problems. Whether the problem is methane gas migration, leachate flowing off the property into groundwater or surface waters or some other type of problem, the department has the authority to take enforcement action against an owner if any problem develops at a landfill. The goal of the enforcement action will be to protect the safety of the public and the environment and to bring the landfill back into compliance.

The WMP cautions potential buyers of property containing a landfill to be fully aware of the potential liabilities and legal obligations they will assume when they purchase the landfill. All potential buyers are strongly encouraged to contact the WMP to discuss the site-specific requirements for the landfill and review the landfill's files. This will enable them to make an educated decision regarding the purchase of the property and prevent them from experiencing the consequences of an uninformed purchase.

If you are considering the purchase of a landfill or have recently purchased property containing a landfill, you are urged to contact the WMP to discuss this purchase.

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