



Ending Explosive Gas Monitoring for Solid Waste Landfills that Ceased Accepting Waste Prior to June 1, 1994.

The key concern for evaluating whether a facility may exit the explosive gas monitoring program is the potential of the landfill to produce explosive gas and if the explosive gas is migrating from the landfill towards occupied structures.

Background Regulation

The criterion to be used to allow solid waste landfill facilities, that ceased accepting waste prior to June 1, 1994; to end monitoring for explosive gas, can be found in Ohio Administrative Code Rule 3745-27-12, which states in part:

“Authorization to discontinue monitoring...may be granted upon the director’s finding that there is no significant likelihood of future explosive gas formation and migration...”

For solid waste landfills that operated after June 1, 1994; please refer to Guidance Document # Ending the Post Closure Care Period of a Solid Waste Landfill.

Request Process

DMWM suggests that five (5) years prior to completing the Post-Closure Care period, the owner or operator of a Municipal, Industrial or Residual Solid Waste Landfill may want to begin assessing the recommended criteria used to evaluate whether a facility may end monitoring for explosive gas. The district office can guide the owner or operator through the process. The owner or operator should discuss ending explosive gas monitoring with DMWM staff prior to making any change in their explosive gas program.

The process to request ending explosive gas monitoring will require the owner or operator of the landfill to provide a written request to the local Ohio EPA District Office for authorization pursuant to OAC Rule 3745-27-12. The request may include the following documentation:

[Explosive gas monitoring within the monitoring probes or punchbars outside of the waste mass of the landfill](#)

Documentation

Explosive gas monitoring results need to show there is not a significant likelihood of explosive gas migrating from the facility towards occupied structures that would be sufficient to require action under the contingency plan contained in the approved Explosive Gas Monitoring Plan (EGMP). The owner or operator should provide explosive gas monitoring results from the monitoring probe or punchbar locations for a sufficient number of sampling events prior to requesting to cease explosive gas monitoring. If the owner or operator has not performed a sufficient number of explosive gas sampling events prior to the request, then DMWM may not be able to provide a positive recommendation to the Director to authorize the cessation. If the results indicate methane present in the monitoring probes or punchbars above 1% volume in air, DMWM may not be able to recommend the owner or operator cease explosive gas monitoring. DMWM recommends a minimum of three (3) years of semi-annual explosive gas monitoring for a total of six (6) explosive gas sampling results provided the facility has been performing explosive gas monitoring in compliance with their approved EGMP. The DMWM recommended sampling frequency of two (2) sampling events a year (spring and fall) would be of a sufficient frequency to account for seasonal variations and to establish a multi-year trend indicating the potential for explosive gas migration from the facility and towards occupied structures.

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For landfills that are operating an active gas extraction system, the owner or operator will need to discuss disabling the active gas extraction system with DMWM before disabling the system. It is necessary to disable the active gas extraction system to appropriately evaluate the potential presence and migration of methane away from the landfill and towards occupied structures. The system should not be in operation throughout this three (3) year explosive gas evaluation period.

Special Considerations

Detection of explosive gas not associated with the landfill

A special case is when explosive gas is detected outside the limits of waste placement but is not being generated by disposed waste. Cessation of explosive gas monitoring can still be considered if the facility is not the source nor contributing to the migration as a pathway. The source may be determined by following the plume back to the source or by analyzing the components of the gas. See DMWM Guidance Document #0531 *Locating Explosive Gas Monitors* for limitations on using punch bars.

Effectiveness or accuracy of the Explosive Gas Monitoring Plan

- The existing plan is not effective in detecting migration

The circumstance may arise where, after further investigation of explosive gas formation and migration, it is determined that the existing explosive gas monitoring plan is not effective in detecting migration. In such cases, the director may require the owner or operator of the landfill to implement paragraph (J) of OAC 3745-27-12. This rule states "The director may require the installation of additional temporary or permanent monitors or abandonment of permanent monitors as necessary to monitor explosive gas pathways or eliminate the potential contamination of ground water."

- The existing explosive gas monitoring plan is not up-to-date for the current conditions existing at or around the landfill.

The circumstance may arise where, after further investigation of explosive gas formation and migration, it is determined that the existing explosive gas monitoring plan has not been revised to detect explosive gas migration towards occupied structures. In such cases, the director may implement paragraph (J) of OAC 3745-27-12. This rule states "The director may require the installation of additional temporary or permanent monitors or abandonment of permanent monitors as necessary to monitor explosive gas pathways or eliminate the potential contamination of ground water."

Explosive gas monitoring within the waste mass

This may require the owner or operator to penetrate the cap of the landfill if gas vents are not available for sampling. Please be aware that authorization from the director may be required prior to performing any activity that may impact the integrity of the landfill cap. See Ohio Administrative Code Rule 3745-27-13 *Procedure to engage in filling, grading, excavating, building, drilling, or mining on land where a hazardous waste facility or solid waste facility was operated*. The district office can guide the owner or operator through the process. The owner or operator will need to discuss explosive gas monitoring within the waste mass with DMWM prior to implementation.

Documentation

Explosive gas monitoring results on top of the landfill (within the waste mass) indicates whether there is sufficient explosive gas formation within the waste mass which could potentially migrate towards occupied structures or that would be sufficient in volume to require action under the contingency plan. The owner or operator should provide explosive gas monitoring results from monitoring locations within the waste mass for a sufficient number of sampling events prior to requesting to cease explosive gas monitoring. If the owner or operator has not performed a sufficient number of explosive gas sampling events prior to the request, then DMWM may not be able to provide a positive recommendation to the Director to authorize the cessation. DMWM recommends, at a minimum, two (2) sampling events per year (spring and fall) for three (3) years, to be sufficient to account for seasonal variations and to establish a multi-year trend in explosive gas formation within the waste mass. Explosive gas sampling locations within the waste mass should be in such numbers and locations as to provide a representation of the potential for the formation of explosive gas within the waste mass. DMWM recommends

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the number of sampling locations to be, at a minimum, of five locations or the square root of the total acreage of the landfill (area of waste placement), whichever is greater. For your convenience, please see the table below for ease of calculation:

Total Landfill Acreage (area of waste placement)	Number of Sampling Locations
≤25 acres	5
>25 and ≤ 36 acres	6
>36 and ≤49 acres	7
>49 and ≤64 acres	8
>64 and ≤81 acres	9
>81 and ≤100 acres	10

If the results indicate methane present in any locations within the waste mass at or above 5% volume in air, DMWM may not be able to recommend the owner or operator cease explosive gas monitoring until such time as the landfill is below the 5% threshold for the presence of methane within the waste mass for three (3) consecutive years.

The owner or operator of landfill facilities which have a cap that does not contain FML (Flexible Membrane Liner) shall repair or replace the cap area that has been penetrated or disturbed by the waste mass explosive gas sampling events. The repaired or replacement cap shall be in accordance with the permit, director’s authorizing actions or the rule effective on the date the landfill was closed.

Landfill facilities which have a cap that contains FML are not to puncture, penetrate or otherwise damage the integrity of the FML cap. These types of facilities may consider implementing an alternative waste mass sampling protocol below.

Special Considerations

Alternative Waste Mass Sampling Locations

Landfill facilities that have a cap that contains FML or who may not have enough sampling locations as outlined above, may use an alternative waste mass sampling location option. The owner or operator of these types of landfills may use leachate sumps, passive gas vents, or active gas extraction wells to evaluate the formation of explosive gas within the waste mass instead or in combination with punchbars or geoprobes to access the waste mass. The recommended number of sampling locations as outlined in step 2 above may be reduced to accommodate the number of sumps, vents or wells available for sampling.

Sampling gas vents or wells for gas formation could be a reliable means for determining whether methane is being formed within the landfill. An appropriate sampling gas vent or well location should not be influenced by the introduction of air into the gas vent or well which could dilute any methane present and result in inaccurate methane gas results.

The owner or operator should discuss an alternative waste mass sampling location option with DMWM prior to implementation as other waste mass sampling procedures may be appropriate.

Contacts

For more information, contact the Land Management/CLOSER Unit (614) 644-2621.

Central District Office - (614) 728-3778

Northeast District Office - (330) 963-1200

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