

# Landfill Gas Control Measures: Passive Gas Ventilations Systems and Atmospheric Pressure

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Ever wonder how gas ventilates? No, it's not a joke, but air physics mitigating landfill gas emissions using passive gas ventilation systems designed for this purpose.

## What is a Passive Methane Gas Management System (MGMS)?

An interconnected network of perforated pipes and the passive gas venting system collects and diverts landfill gases from underneath the buildings underlying geomembrane, creating a gas barrier. It moves gases away from the building and into the atmosphere via vent risers. The MGMS offers preferred pathways for safe gas migration.

## What Environmental Conditions Can Affect MGMS Performance?

The efficiency of a passive MGMS depends on environmental conditions, which may or may not be controlled by the system design. For example, atmospheric pressure can affect passive ventilation. Gases accumulating in the MGMS can create areas of high pressure. The variation in pressure throughout the MGMS results in gases moving from high to low-pressure areas. As more gases generate, the pressure in the MGMS increases, causing higher pressures in the MGMS than the atmospheric pressure, so the gases migrate to the ambient air or atmosphere. Conversely, high atmospheric pressure sometimes results in ambient air entering the MGMS through the vent risers.

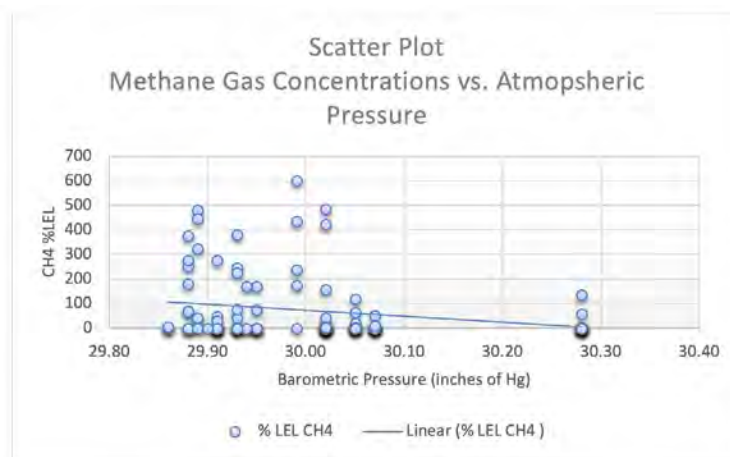


Figure 1



Passive Gas Vent Riser (typ.)

## Case Study: Methane Gas and Barometric Pressure Readings: Old Closed Landfill Project

Methane gas concentrations and barometric pressure readings were recorded from March 2019 through June 2022 at the passive vent. The readings were plotted and shown in the scatter plot (see Figure 1).

## System Performance Factors

There is an inverse correlation between methane gas concentrations and atmospheric pressure conditions. For instance, methane gas concentrations were lower during high ambient atmospheric conditions and vice versa. Gas readings are compared to historical readings to determine if there has been a

change in the system performance. Many factors could cause changes in system performance, but atmospheric conditions at the time of gas monitoring may contribute to the performance of the passive MGMS. Therefore, we could conclude that the passive landfill gas ventilation strongly depended on barometric pressure changes.

So next time you are evaluating system performance, check the weather.

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