



Landfill Gas Control and Monitoring Case Study

Active Gas Control: Colma Landfill Warehouse Retail Store

Landfill gas (LFG) is a product of bacterial decomposition of organic wastes deposited in a landfill, combined with integrated moisture within the waste or from moisture invading the waste. Landfill gas production will continue until all of the organic matter in the waste decomposes. Landfills with design capacity in excess of 2.5 million cubic meters (Approx 3.3 million cu yd) are subject to the requirements of 40 CFR 60.752 (b) through 60.759. Landfill gas consists of methane, carbon dioxide and other gases.

Colma Landfill employs an "Active Gas Control" system, in which landfill gas is controlled or diverted via barriers and gas conduction systems that function with active powering systems, diverting and venting the gas from the landfill, into the atmosphere through positive or negative pressure with fans ("blowers").

In this project, a large warehouse retail store was constructed on top of the closed landfill with high waste decomposition and landfill gas generation. To prevent landfill gas from invading the closed space of the building being constructed on the landfill, the project was fitted with three important components. These protective systems include: passive gas permeability barriers consisting of HDPE flexible plastic sheet and gravel for a porous gas conductor under the concrete slab and venting systems consisting of underground articulated, perforated PVC piping embedded in the gravel under the slab to collect the gas and powered fans to conduct gas by evacuating pressure to a "candlestick" flare located away from the building, proper. The articulated piping for gas allows the pipes to flex with the compacting decomposing waste, avoiding breakage and potential for gas leaks. The large volumes of landfill gas that are generated are conveyed to a flare where it is burned to eliminate potential hazard and pollution.

In addition, the structure is placed on top of concrete support pilings that bear the weight of the building. The floor slab is heavily reinforced with "re-bar" for rigidity. This design feature keeps the structure from loading and compressing the landfill with its weight. In turn, with the reinforced floor and piles, the building will not subside and settle with the uneven settling of the landfill as the waste decomposes and reduces in volume.

The structure is also connected to the subsiding landfill surface with hinged ramps for all entries and loading ramps.