

Study of Soil Vapor Intrusion Associated with Manufactured Gas Plants (MGPs)

Description: A characterization of MGP tar vapors to determine the compounds specific to MGP tar so extensive and intrusive customer sampling can be minimized.

Status: Lab analysis of field samples has been completed.

BENEFITS

The accurate characterization of MGP coal tar vapors will reduce false positives from Volatile Organic Compounds (VOCs) attributed to sources other than MGPs such as household solvents, fuels, etc. The reduction of these false positives will reduce indoor air and sub-slab vapor sampling, thereby reducing negative public relations and costs to utilities.

BACKGROUND

MGPs were industrial facilities that produced heating/lighting gas from coal, oil and other feedstock. Coal tar is a dense oily liquid by-product from the gas production process at MGPs. It was occasionally disposed of via on-property pits or other land disposal activities, from which it could contaminate soil, groundwater, surface water, and sediments near former MGP sites. The presence of coal tar in soil or ground water can potentially migrate to surrounding areas and possibly release vapors which can penetrate into the indoor air space of buildings or where humans/animals inhabit (Figure 1).

Vapor from MGP coal tar may contain a number of chemical constituents that are a potential concern to the environment when left untreated. Two primary constituents include BTEX

compounds and semivolatile organic compound (SVOCs). BTEX compounds are benzene, toluene, ethylbenzene, and xylenes. SVOCs are semi-volatile organic compounds, specifically naphthalene, a polycyclic aromatic hydrocarbon (PAH).

Earlier concerns from the New York State Department of Health (NYSDOH) were formed when studying chlorinated solvent compounds in soil and groundwater and their impacts to indoor air quality. This led the regulators to raise concerns about indoor air impacts in dwellings near MGP sites.

As a result, soil vapor intrusion investigations have been required near MGP sites during the remedial investigation phase since 2004. Current regulatory guidance bases MGP contamination on the presence of BTEX compounds alone. However, there is no conclusive evidence to support this evaluation method, while BTEX compounds are found in many household products. With the current guidelines, most soil vapor intrusion

(SVI) tests will lead to sub-slab sampling although non-MGP sources may be the true cause. The cost of indoor air and sub-slab sampling ranges \$10K to \$15K per dwelling.

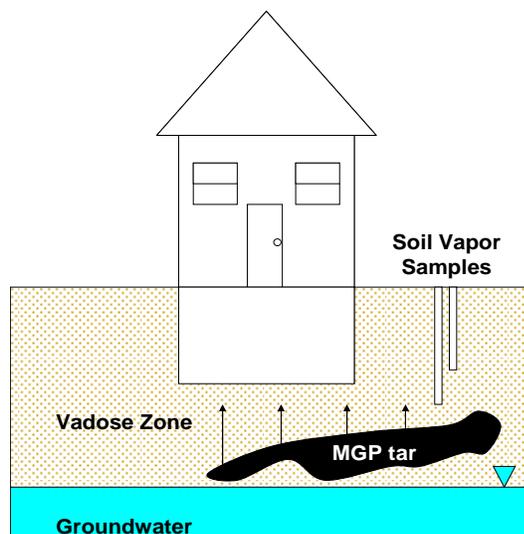


Figure 1: A Simplified Depiction of MGP Tar Vapor Intrusion

TECHNICAL APPROACH

The first goal of the study is to characterize MGP tar vapors in a controlled laboratory test setting. The second goal is to determine the ability to compare soil vapor samples collected above an actual MGP tar source to the concentrations of chemical groups measured in the controlled laboratory test setting.



Figure 2: Soil Vapor Sampling at a Former MGP Site

This project will characterize MGP tar vapors and determine compounds specific to MGP tar. Field testing at (5) sites with a known presence



Figure 3: Standard NYSDEP Soil Vapor Sampling Canister

of MGP tar will validate marker compounds (Figure 2). This will solidify a basis for identifying the presence of MGP coal tar contamination through soil vapor testing (Figure 3).

The project is being implemented in six tasks: Project Planning, Sample Collection, Laboratory Analysis, Quality Assurance/Quality Control, Data Analysis and Reporting. The final task of reporting will develop a public report. The report will serve as the foundation for changes to the NYSDOH guidance document. The resulting peer reviewed manuscript is co-authored by the regulatory community and is expected to be used to appropriately shape future decision-making.

PROGRAM STATUS

Regulator involvement within the project ensures the timely attention to new results that warrant change in regulations. This involvement is also providing mutual guidance and transparency to all parties involved so that science dictates an appropriate treatment of the environment. The lab analysis of collected field samples has been completed at the discretion of the NYSDOH. Quality control and assurance (QA/QC) measures are being performed to approve the use of the field data for analysis and developing conclusions. The data is being analyzed in parallel with the QA/QC task to minimize the time of project completion.

Highlights

- Minimize indoor air and sub-slab vapor sampling.
- Regulator project involvement ensures timely regulatory change if determined appropriate.

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