

Sewer Preferential Pathway Vapor Intrusion: Fake News or the New Normal?

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Background/Objectives. There is a growing recognition that preferential pathways can play an important role at sites affected by vapor intrusion. Although this pathway is often mentioned in regulatory guidance documents, there is little information concerning the prevalence of this pathway. There is also limited guidance on identifying sites with preferential pathways. As a result, preferential pathways are not currently being investigated in a consistent manner.

Approach/Activities. Through a research project funded by the Department of Defense ESTCP program, we have conducted a systematic testing program to better define the prevalence of VOCs in sewer lines. For this purpose, we measured VOC concentrations in sewer lines at more than 30 sites with known chlorinated VOC plumes in groundwater. Multiple rounds of sampling were conducted at a subset of these sites. At most of these sites, there was no prior sewer testing and no prior evidence of a sewer pathway.

Results/Lessons Learned. Chlorinated VOCs were detected in over 90% of sewer manholes located in close proximity to known groundwater plumes and at a lower frequency at background locations. Approximately 50% of samples contained VOCs at concentrations more than 10 times indoor air screening levels. Maximum concentrations were as much as 1000 times indoor air screening levels. For manholes tested multiple times, VOC concentrations commonly varied by up to 100x between sample events. Tracer testing was also conducted as part of our research program. This testing showed that measurable gas exchange commonly occurs between sewer lines and connected buildings. Thus, when VOCs are present at elevated concentrations within sewer lines, there may be some risk to connected buildings.