

TEMPORAL (OVER TIME) VARIABILITY

Recent research shows that toxic vapor concentrations intruding from the subsurface into buildings vary significantly over time. Continuous monitoring at research houses in Indiana and Utah shows that levels go up and down on a daily cycle, seasonally, and with atmospheric conditions. The old way of sampling once or twice a year can easily underestimate or exaggerate exposure. In the case of compounds believed to pose short-term health risks at low exposure levels, such as TCE, this is a particular problem. One would have to sample a building many times a year to ensure that a peak in concentration is not missed.

Traditionally, investigators have tried to overcome temporal variability by guessing when the worst exposure case will occur. This is why most regulatory guidances say that at least one sample should be taken during the “heating season,” winter months when homes are normally tightly sealed and the pressure differential between the indoors and subsurface is usually greatest. Some researchers suggest that the temperature difference between inside and outside is the key driver of vapor intrusion. Less seems to be known about when worst cases occur in climates with milder winters.

In areas where temporal variability is known to be significant, or merely unmeasured, there is a need to sample more frequently or simply to go straight to mitigation. Emerging sampling strategies such as Building Pressure Control or Real/Near-Real-Time Sampling can measure peak intrusion, reducing the need for frequent conventional sampling.

See <http://www.cpeo.org/pubs/SGVI/EmergingStrategies.pdf> to learn more about **Emerging Sampling Strategies**.

A few research teams are working to develop small, inexpensive devices to measure selected VOCs and transmit data via Internet or wireless technology, for deployment in individual homes and other locations. But despite years of promise none have yet made it to market.

Click on <http://www.cpeo.org/pubs/SGVIU.html> to return to the *Stakeholder's Guide Update* main page.