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# Effectiveness of a Sub-Slab Depressurization System at an Alternative Vapor Intrusion Pathway Site

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**Background/Objectives.** Sub-slab depressurization (SSD) is the presumptive VI mitigation strategy for homes with VI impacts. However, in cases where alternative VI pathways are present either as the sole source of contamination or are in addition to the standard soil pathway, the effectiveness of SSD is unknown. The purpose of this research is to test the effectiveness of SSD at an alternative VI pathway site. The study was conducted at a well-studied, VI-impacted research house, where the neighborhood land drain system and a lateral pipe connecting that system to the sub-slab region form an alternative VI pathway for chlorinated hydrocarbons to migrate to indoor air.

**Approach/Activities.** A butterfly valve was installed in the lateral pipe to allow researchers to open/close this alternative VI pathway. Indoor air and sub-slab concentrations of VOCs and radon and differential vacuums between the sub-slab region and indoor air were monitored during SSD operation when the land drain lateral was open and closed.

**Results/Lessons Learned.** During SSD operation at this research facility, indoor air TCE concentrations were similarly low (<0.04 $ppb_v$) when the land drain valve was open and when it was closed. However, it should be noted that the presence of one or more alternative pathways may lead to insufficient SSD performance. For example, one concern is that significantly elevated sub-slab soil gas TCE concentrations were caused by SSD operation with the alternative pathway connected; the elevated concentrations persisted for days to months after the SSD system was switched from on to off. The vacuum between the sub-slab region and indoor air was also about 20-45% less near the alternative pathway land drain lateral connection point when it was open.