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PERSPECTIVE

## EPA guidance brings consistency, preserves flexibility

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“Vapor intrusion” has become a hot topic in California and throughout the country in recent years. In Mountain View, for example, vapor mitigation measures may be required as part of the development permit process for buildings located over contaminated groundwater plumes. State and federal environmental agencies have issued a number of guidance documents and standards to address vapor intrusion at contaminated sites. Some of these deal specifically with the contaminant, trichloroethylene (TCE).

Those who grapple with applying these various standards have looked to the U.S. Environmental Protection Agency for guidance. On June 11, the EPA responded, issuing its long-awaited final technical guidance on vapor intrusion assessment, titled “Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air.” Although the guidance has broad coverage, it does not supersede existing policies of other agencies, and stakeholders may have difficulty in understanding the interplay among the various policies.

Vapor intrusion is the upward migration of volatile organic compounds (VOCs) from contaminated soil or groundwater into an overlying building. Common VOCs include TCE (an industrial solvent), perchloroethylene (PCE) (a chemical used in dry-cleaning), and gasoline and petroleum constituents. Vapor intrusion typically occurs when VOCs migrate into indoor air through penetrations in building foundations, such as cracks in a concrete slab or through utility corridors and elevator shafts. This

is considered potentially harmful to human health because once inside a building, vapors can be inhaled by building occupants, often unknowingly.

In addition to the national EPA guidance, the EPA’s Region 9 office (covering the Pacific Southwest) and the Regional Water Quality Control Board for the San Francisco Bay Region have developed standards for addressing vapor intrusion at properties contaminated with TCE.

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The Region 9 guidance establishes stringent numerical short-term action levels for TCE at Superfund sites. Many mature sites are being revisited at the time of the five-year review so vapor intrusion can be investigated. The short-term levels and requirements for “accelerated” and “urgent” response actions — including the evacuation of sites — are based on Region 9’s view that TCE is capable of causing birth defects. Region 9 believes TCE may cause fetal heart malformations when women in their first trimester are exposed to even very low levels of it for very short periods. However, there has been substantial criticism of the basis of these conclusions.

At some of the South Bay Superfund sites, Region 9 has directed responsible parties to test indoor air in all buildings located over groundwater plumes containing 5 parts per billion or more of TCE — a policy that could require thousands of buildings to be tested. CH2M Hill, a nationally-recognized consultant, estimates that monitoring vapor intrusion for a 7,000 square foot commercial building could cost over \$200,000. Those estimates are just

for testing, and don’t include the installation of a vapor mitigation system. With thousands of commercial buildings located over TCE plumes, the cost of monitoring vapor intrusion in Region 9 alone could be in the hundreds of millions of dollars.

The San Francisco Water Board’s guidance, which only covers TCE contaminated sites under the board’s jurisdiction, incorporates Region 9’s short-term action limits. However, it recommends a step-wise approach and does not immediately require indoor air testing, which Region 9 appears to favor. Nor does the water board’s framework adopt a 5 parts per billion investigation guideline. Under the water board’s step-wise approach, it is still possible to eliminate costly indoor-air sampling by testing soil vapor and groundwater and comparing results to default values. If the default levels are exceeded, site-specific modeling is conducted. If indoor air testing is required, and testing levels exceed the short term action limits, further response actions are triggered.

The new national EPA guidance is not limited to TCE-contaminated properties. It applies to site investigations for residential and nonresidential properties undertaken under the Comprehensive Environmental Response, Compensation, and Liability Act, the Resource Conservation and Recovery Act, and the EPA’s Brownfields program. The guidance lays out a conceptual framework for assessing vapor intrusion risk. It emphasizes the importance of evaluating multiple lines of evidence, including sampling results from outside of a building and models to assess vapor intrusion risk. Additionally, the guidance describes monitoring and vapor intrusion mitigation systems, and recommends preemptive action when possible, such as installing engineering controls in buildings

while an investigation is being conducted.

Interestingly, the guidance addresses many questions received from the public through extensive footnotes. These footnotes describe precedent the agency has followed on specific issues. The guidance also calls for multiple rounds of indoor air sampling to address seasonal effects — a significant cost for many sites. The EPA is also asserting its “broad authority” to protect workers from indoor air pollutants, directly confronting critics who have objected to the stark disparity between the OSHA worker safety permissible exposure limits (PELs) and standards for individual chemicals such as TCE. Pointing to a statement on OSHA’s website, the guidance states: “OSHA recognizes that many of its [PELs] are outdated and inadequate for ensuring protection of worker health.”

Although the national EPA guidance states that it is intended to promote a consistent approach to addressing vapor intrusion risk across the country, it preserves flexibility for regional offices and state and local agencies to address individual sites. As a result, it likely will be viewed as a baseline framework from which agencies may craft or continue to apply their own policies. Within this framework, state and federal environmental authorities like the California water boards and EPA regional offices may take varying approaches that could lead to vastly different outcomes. The particular approach that these various agencies choose to follow for any given property could have very significant cost implications for property owners and responsible parties.

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