

Vapor Intrusion: The New Hot Topic

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As the economy slowly makes its upward trends, many new real estate transactions are getting hampered by indoor air vapor intrusion. If you are like most real estate investors or developers, you have one of two reactions: What in the world is that? Or you roll your eyes in disgust that you have to deal with this issue yet again. Over the last two years during the economic downturn, very few lenders were lending money on new deals. Most were spending time evaluating foreclosures and the environmental risks that came with poor underwriting and/or inadequate due diligence.

During that same time, a lot of advances were made relative to indoor air vapor intrusion research and case studies. While the lenders were licking their wounds over environmental liabilities, they began seeing areas to tighten up their scopes of work, one of which was indoor air vapor intrusion. What does all of this translate into? Many of our clients, particularly developers and others seeking financing or refinancing are having to quickly learn about this issue and make go/no-go decisions on real estate transactions and developments.

What is vapor intrusion and what does it mean to you? Simply stated, vapor intrusion is the transport of chemical vapors from subsurface soils and/or groundwater into buildings through the natural exchange of air or mechanical ventilation. Vapor intrusion is highly site specific due to varying natural conditions, contaminants and migration pathways. A few of the common variables that affect vapor intrusion include: contaminant type (i.e. petroleum compounds or chlorinated solvents), type of soil(s) beneath the structure, contaminant concentration, exposure/contaminant migration pathways (i.e. foundation cracks, utility trenches), depth and location of contaminants relative to the structure, and building/ventilation system design.

The two most common classes of chemicals of concern for indoor air vapor intrusion include chlorinated solvents and petroleum hydrocarbons. The most common sources of chlorinated solvents are dry cleaners (tetrachloroethene, also known as perchloroethene, PCE and perc) and vapor degreasing operations (trichloroethene or TCE and 1,1,1-trichloroethane or 1,1,1-TCA). However, PCE often degrades into TCE, which often degrades into cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene and vinyl chloride, each of which are also potential vapor intrusion chemicals of concern. The common petroleum hydrocarbons of concern include: benzene, ethylbenzene, toluene and xylenes, commonly referred to as BTEX, and methyl tertiary butyl ether or MTBE. It should be noted that other volatile chemicals of concern, including mercury, may also contribute to indoor air vapor intrusion.

The questions many of our clients are asking is, “Why should I care about this? and why am I having to deal with this now?” First, past regulatory closures typically evaluated soil and groundwater exposure pathways, but did not include evaluation of vapor migration into buildings. As a result, closed regulatory cases in both New York and California have been reopened in order to include evaluation of vapor intrusion, and in many cases installation of vapor mitigation systems or additional remediation activities have been required. It should be noted that vapors can accumulate inside buildings below the odor threshold, but above allowable regulatory standards, which leads to greater concerns over being able to know whether a building is impacted. Additionally, vapor cases are becoming topics of litigation, which could potentially cost property owners or lenders severe monetary and/or reputational risks.

“Why is this issue coming up on my site?” Due to the fact that many past regulatory closures left contamination in place in soil and/or groundwater on a site, many existing developments, even if constructed in the last few years, are being scrutinized for vapor by lenders. “My state does not regulate the vapor intrusion pathway, so why do I have to deal with this issue?” At present, approximately 28 states have either enacted or are in the process of enacting vapor intrusion rules. Additionally, the USEPA is near completion of a final version of their draft vapor intrusion guidance document (expected finalization date is 2012 to 2013). Although your state does not currently regulate vapor, they likely will in the future. Also, many lenders are incorporating vapor intrusion evaluation into their scopes of work, thus when you seek permanent financing or refinancing of a project, you will likely have to deal with this issue. Often, it is easier to deal with mitigation pre-construction as opposed to post-construction. To add fuel to the fire regarding dealing with vapor issues, the American Society for Testing and Materials (ASTM) E-1527-05 standard for Phase I Environmental Site Assessments is currently undergoing revisions, and one of the expected revisions is the consideration of the vapor pathway for evaluation of Recognized Environmental Conditions (RECs).

“How do I find out if I have a potential indoor air vapor issue on my site?” There are a number of ways to evaluate the potential for vapor intrusion. ASTM has published a Vapor Encroachment Screening guidance document that uses information gathered during a Phase I ESA that can be conducted concurrent with a Phase I ESA to evaluate whether your site has potential for vapor issues. If your site is determined to have a potential for vapor issues, or you know that contamination exists beneath your site or is likely to be located beneath your site, vapor testing can be conducted. Vapor testing can be conducted through soil gas sampling, sub-slab sampling and/or indoor air testing. It is recommended that at least two of these methods be conducted so that two lines of evidence are being evaluated. Additionally, if you are conducting indoor air testing, numerous factors need to be considered, including potential chemical sources from common products within the building, outdoor sources that are being introduced into the building via the air handling system and proper placement of the indoor air sampling device. Soil vapor and indoor air sampling can be complicated; therefore, it is very important to ensure that you have a qualified consultant team completing the testing work.



Many clients are opting not to complete testing, and instead move directly to mitigating vapor intrusion concerns on pre-construction sites. In these cases, owners and developers are choosing to install commercial vapor barrier systems with venting to prevent vapor intrusion into their buildings. Many of these systems consist of a vent underlying a barrier that will passively vent vapors that collect beneath the vapor barrier. These vents can also be converted to active systems with the installation of a blower and vent piping to actively remove larger volumes of soil gas/vapor from beneath structures. Many of the popular systems in use are spray-on applications that provide a thick barrier that can withstand construction equipment and other construction activities such as tying rebar and pouring a slab. Popular post-construction solutions include installation of sub-slab depressurization systems, similar to radon mitigation systems installed on buildings in high radon areas.