



BY KEVIN W. GREEN, P.G.

# VAPOR ENCROACHMENT & INTRUSION

WHAT ARE THE REAL (ESTATE) RISKS?

Over the past decade, there's been a growing body of evidence that chemicals in subsurface soil vapor can penetrate building foundations at levels that, in the long term, raise health concerns for the occupants. This, in turn, raises liability issues for landlords, lenders, tenants, employers or any other party that might be responsible for the original source of the contamination, or for exposing building occupants to potential health risks.

A vapor encroachment condition (VEC), as defined by the American Society for Testing and Materials (ASTM), is the presence or likely presence of volatile organic compound (VOC) vapors in the subsurface of the target property (TP) caused by the release of vapors from contaminated soil or groundwater either on or near the TP. The VOC release generally has to be in proximity to a structure (e.g., within 50 to 100 feet) in order to create a VEC. However, under certain circumstances a VEC may exist hundreds or even thousands of feet from the source of the VOC release—for example, through the off-gassing of VOCs from a migrating plume of contaminated groundwater. The process by which a VEC is determined is called a Vapor Encroachment Screening (VES).

If a VEC is determined to exist, it is possible for the vapors to intrude into a building, creating a vapor intrusion condition (VIC). If

VOCs are present at sufficient concentrations, diminished indoor air quality (IAQ) and/or health risk concerns may result. VOCs may infiltrate a building through cracks in flooring, openings in a foundation (such as utility conduits), migration through the slab and/or air exchange points (air handling units, doors, windows etc.). The potential for a VIC may be exacerbated by pressure differentials created by heating and air conditioning systems that pull VOCs from subsurface soil vapor into overlying structures.

It should be noted that VOCs are present in virtually all air, indoors or outdoors. Many common household products such as cleaners, polishes, adhesives, plastics, carpets, etc. contain chemicals which can complicate an assessment of VOCs, and make it more difficult to discern a VOC source. Technical methods to assess a VIC have limitations. The issue for property managers becomes one of how to rationally address the issue of vapor encroachment and/or intrusion.



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### INVESTIGATION COSTS AND REMEDIATION COSTS

The cost to complete a one-day soil gas survey or assessment generally runs between about \$6,000 and \$8,000. Completing one phase of investigation could lead to additional phases of investigations, and ultimately remediation of a VIC. The costs to complete “Phase II” soil and/or groundwater investigations can vary widely based on a number of factors (number of borings, sample analyses, depth to groundwater, etc.), but typically range up from a minimum of \$10,000 to \$20,000. Remediation costs can also vary widely based on the contaminant concentrations, sources, volume of impacted soil/soil vapor, etc., ranging from several tens of thousands of dollars to several hundred thousand dollars or far more.

### REPORTABILITY

The ASTM E2600-10 VES standard is a guidance document only and does not have regulatory agency reporting requirements. Regardless, those involved in real estate (developers, investors, lenders, equity firms, etc.) are normally asked within a transaction to represent and to disclose all known environmental concerns.

Disclosing a potential or real VEC or VIC could stigmatize a property with an unfavorable image and in all likelihood kill some deals, place expensive requirements (possible remediation or environmental insurance) on sellers and borrowers, de-value property and reduce purchase prices at the time of sale in order to address the concerns of stakeholders. However, this scenario is no different than any other environmental concern brought to the forefront in a transaction.

The completion of a vapor encroachment screening is voluntary and not

### ASTM E2600-10

In 2009, effective in 2010, ASTM finalized the guidance now referred to as *ASTM E2600-10, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*. This final guidance proceeds with a two-tiered approach to assessing a potential VEC in a real estate transaction. The purpose of Tier 1 is to use Phase I Environmental Site Assessment (ESA)-type information to determine if a VEC might exist. If the Tier 1 screen cannot rule out the possibility of a VEC existing, then Tier 2 (review or obtain additional data) can be completed. Tier 2 applies numerical screening criteria to existing or newly collected soil, soil gas and/or groundwater testing results to evaluate whether or not a VEC can be ruled out. Tier 2 has two data collection components: one non-invasive and one invasive. The non-invasive approach uses available documents (e.g., existing Phase II investigation reports) prepared to directly address the source of contamination and its migration in the subsurface (normally reviewable at a regulatory agency if available). An invasive approach develops site-specific data by collecting and analyzing soil, soil vapor and/or groundwater samples.

### RELATIONSHIP OF ASTM E2600-10 (VES) TO ASTM E1527-05 (AAI)

ASTM E 2600-10 is a separate guideline from the ASTM E1527-05 guideline for conducting due diligence for a real estate transaction. That said, E2600-10 states that the guidance outlined in E2600-10 can be used independently or used concurrently with practice E1527-05. Some companies have decided to incorporate vapor encroachment screening into their due diligence guidance practice and include it with their Phase I Environmental Site Assessment (ESA).

### RECOGNIZED ENVIRONMENTAL CONDITION (REC)

Is a VEC a REC? According to E2600-10, a REC can only be identified pursuant to a Phase I ESA or through the performance of an ASTM E1527 Phase I ESA. ASTM E2600-10 states;

*"... a finding pursuant to this guide that a VEC exists or likely exists at the TP (target property) or that a VEC cannot be ruled out for the TP is not a determination that a REC is identified at the TP. Whether a REC exists at a TP as a result of the impact of possible vapor mitigation to the subsurface of the TP is a separate determination to be made by the environmental professional pursuant to Practice E1527."*

Based on this citation, calling a VEC a REC is a judgment call on the part of the environmental professional (EP) and can only be done within the context of ASTM E1527-05. It is clear that some consultants make a REC call more readily than others. Either approach could have either good or bad ramifications for investors/clients. Consultants should consider their client's line of business (buying, owning, selling, lending), risk tolerance level, and should have a conversation on expectations prior to completing the ESA for the client.

From an ESA "User" prospective, if a VEC or VIC is characterized as a REC it could stigmatize the property if the "User" does not follow through with additional investigation. It should be noted that the decision to conduct a due diligence ESA is voluntary in most states. Also, completing an All Appropriate Inquiry (AAI)-compliant ESA is intended for the purpose of sustaining one of several Superfund (CERCLA) defenses against liability. In reality, most sites with environmental problems will never become a CERCLA or Superfund site. More importantly, those involved in real estate have a greater risk of being exposed to environmental liabilities that are non-CERCLA related. In general, an environmental liability often results in a future financial liability, which may include paying for investigations, remedial fixes, obtaining regulatory closure, asset devaluation, lawyers, etc.

required by local, state and federal regulations. However, the VES or similar process is often required by state or local regulatory agencies as part of the property redevelopment process or because of a known chemical release or spill. That said, market conditions appear to be heading toward holding buyers, sellers and borrowers accountable for potential vapor intrusion in their real estate assets. Some states have promulgated their own VI guidance and regulations. Therefore, state regulations should be reviewed for applicability on a case-by case basis.

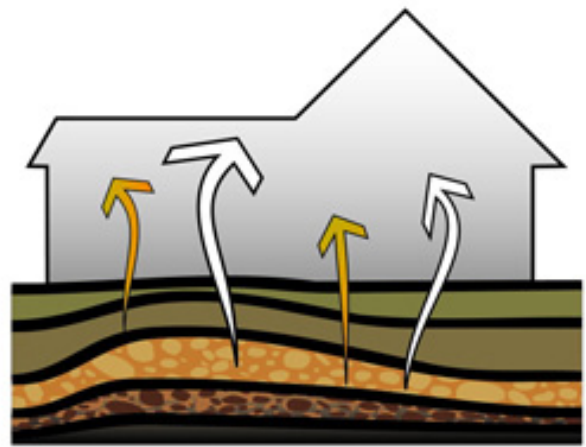
In some cases, real estate firms, buyers, sellers and borrowers may be pressed (by the market) to disclose an issue to a regulatory agency in order to get resolution prior to completion of a deal. Reporting may be forced regardless of the lack of actual agency requirements to disclose.

### RISK AND LIABILITY

Vapor intrusion is a relevant business concern, environmental concern and risk concern in real estate transactions and where property serves as security in a loan transaction. It is not unlike any other environmental concern that must be dealt with in a real estate transaction. When considering risk in any business venture, certain fundamental premises should always be considered, such as:

- There is no such thing as zero risk. Risk is inherent in any business activity.
- There is no so such thing as zero contamination. Hazard-

## “MARKET CONDITIONS APPEAR TO BE HEADING TOWARD HOLDING BUYERS, SELLERS AND BORROWERS ACCOUNTABLE FOR POTENTIAL VAPOR INTRUSION IN THEIR REAL ESTATE ASSETS”



VAPOR INTRUSION

- ous substances are ubiquitous.
- All risks are relative and fall on a continuum between small and large risks.
- Most environmental problems can be addressed in a manageable cost range.
- No matter how good a risk management program is, environmental problems will surface in the real estate business.
- Someone will always be willing to own and operate a piece of real estate, regardless of problems.
- Before conducting any environmental work, consider all possible outcomes. Be prepared to act upon the information you collect. If you do not understand how you will respond, do not develop information until you do know what your responses might be.

Many real estate professionals, hearing that an environmental problem has been discovered in one of their deals, will assume a worst case scenario and kill the deal. It is a relatively rare circumstance when a real estate deal faces multi million dollars of Superfund liabilities. Not to minimize the issue, but the standard human health risk guidelines for VOCs and vapor intrusion are generally

based on decades of exposure to VOCs; in the short term, the actual health risks from known or suspected vapor intrusion can be negligible.

Another relevant risk in vapor encroachment screening is that the findings may lead to assessments of other potential environmental issues such as site-specific health risks, groundwater impacts, impacts to terrestrial and aquatic habitats, erosion of contaminated soils and nuisance (e.g., odor and staining).

Any such environmental contamination issues that are identified are often evaluated separately. If a formal regulatory decision or determination is desired, additional assessment or cleanup of contaminated soil or soil vapor to address these concerns may ultimately be required.

### ALL VAPOR INTRUSION ISSUES ARE NOT EQUAL

A potential vapor intrusion issue should be treated like any other environmental concern that might impact a property—issues like asbestos, lead based paint, radon, etc. It would be a great disservice to certain stakeholders if in all cases a maximum response were implemented to any potential environmental risk or liability. Alternatively, it would also be a great disservice to certain stakeholders if a VEC or a VIC were literally swept under the rug. An “I know nothing” approach could unduly expose an organization to significant environmental risks and liabilities.

Jumping to the collection and analysis of indoor air samples is not warranted without information regarding the nature and extent of any VEC. And there are clearly times when “doing nothing” is the appropriate response to an imagined VEC or VIC. As with any environmental issue, it is recommended that stakeholders evaluate and respond to a real or potential vapor encroachment or intrusion condition with a measured, logical, step-by-step approach – developing additional technical information as appropriate. A metered response to a real or potential vapor intrusion condition is warranted. One size does not fit all. ■



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