

## Vapor Intrusion: Risks and Remedies

By William J. Squires III

Buyers, sellers, owners and developers of real property should be aware of the potential costs and risks associated with vapor intrusion into buildings. Although vapor intrusion issues have existed for decades, state and federal regulators throughout the nation recently have become increasingly concerned with vapor intrusion, resulting in rapidly evolving legal standards and obligations. Early evaluation of potential vapor intrusion pathways can help to manage and reduce costs and avoid potential risks.

### WHAT IS VAPOR INTRUSION?

When volatile or certain semivolatile organic compounds are present in groundwater or soil under a building, those compounds can volatilize from a liquid to a vapor that can pass through soil, fissures in bedrock, and cracks and other openings in building foundations. Vapors move from higher pressure to lower pressure, so vapor intrusion into a building can occur when the pressure inside the building is lower than the pressure in the soil gas under the building slab. The presence of volatile or semivolatile organic compounds (collectively "VOCs") in indoor air, even at very low levels, can pose potentially significant health risks to residents, workers and other building occupants, including an increased cancer risk. The severity of the risk depends on several factors, including the nature and concentration of the vapors present in the building, the age and health of the individual, and the amount of time an individual spends inside the building. Consequently, the most restrictive regulatory requirements for indoor air (in states where such requirements exist) apply to residences, schools and day care facilities.

When dealing with vapor intrusion issues, the most commonly detected VOCs are degreasing agents (such as trichloroethylene and trichloroethane), petroleum compounds and dry cleaning solvents (primarily perchloroethylene). There are thousands of sites throughout the country at which VOCs have been detected in soil, groundwater, soil vapor or indoor air. Some of the more obvious properties at which vapor intrusion issues may exist are properties that are or have been used as manufacturing facilities, dry cleaners, gas stations, landfills, train yards, chemical processing plants and other industrial uses. Less obvious examples include: (1) commercial buildings, residences and schools that have been affected by VOC plumes in groundwater emanating from VOC-impacted sites (as an example, a party responsible for a VOC groundwater plume at a former manufacturing facility in New

York State has installed vapor mitigation systems in more than 400 residences affected by the plume); (2) residential and commercial buildings located near leaking underground or above-ground storage tanks; and (3) vacant land where VOCs were dumped.

### EVOLVING REGULATORY ENVIRONMENT

The traditional remediation approach established by the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA" or "Superfund") and similar state laws has focused on protecting human health from direct contact with contaminants through ingestion and dermal contact, with little attention on inhalation. State and federal regulators, however, are increasingly concerned about vapor intrusion into occupied buildings due to a growing consensus among regulators that the significance of vapor intrusion issues at VOC-impacted sites has been underestimated historically. The increased concern of regulators is due, in part, to more extensive sampling data at VOC-impacted sites that show that vapor levels in soil samples collected from beneath building slabs are often many times higher than vapor levels in soil samples collected near such buildings. The higher vapor levels present in soil beneath a building are likely due to the fact that a building's slab acts as an obstruction causing vapors to accumulate in the underlying soil, coupled with the fact that negative pressures typically induced in buildings can draw vapors to the sub-slab.

The United States Environmental Protection Agency ("EPA") and more than 25 states have issued various regulations and guidance addressing vapor intrusion. Although much of the recent regulations and guidance, including a 2002 EPA draft guidance document, is limited to recommendations on evaluating vapor intrusion pathways, some states have more burdensome regulations. In addition, ASTM International, a private organization that develops voluntary standards, recently published guidelines for evaluating vapor intrusion pathways (for more information regarding the ASTM standard, please refer to our recent client alert posted to bingham.com on May 16, 2008 titled "ASTM Issues New Vapor Intrusion Assessment Standard for Real Estate Transactions").

In Massachusetts for instance, the discovery of a vapor intrusion pathway in a residence, school or day care facility is considered a critical exposure pathway that triggers substantial regulatory obligations to take immediate action

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KNOW YOUR INTERMEDIARY, CONTINUED FROM PAGE 9

qualified intermediary might cause a transaction to run afoul of applicable law due to human error. To protect against such mistakes, an investor should ensure that its qualified intermediary carries sufficient errors & omissions coverage. As with fidelity bond coverage, discussed above, an investor should obtain a copy of the intermediary's insurance binder and the insurance company's contact information to confirm that the intermediary's policy is in full force and effect and that the coverage is on a "per occurrence" basis rather than "in aggregate."

**Restrictions on Funds Generally:** An investor's agreement with a qualified intermediary can specify the types of investments to which the intermediary can apply the deposited funds. Investors should require intermediaries to keep deposited funds in safe, short-term investments and prohibit other, more speculative uses. Additionally, investors can request that funds be held in dual signature accounts, so that the funds cannot be moved without the authorization of both the qualified intermediary and the investor. <

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to eliminate, prevent or mitigate the vapor intrusion pathway. In many instances the Massachusetts regulations also require the evaluation of vapor intrusion pathways in conducting risk assessments necessary to achieve regulatory site closure. Like many state agencies, the Massachusetts Department of Environmental Protection ("MADEP") is reevaluating its regulations and guidance regarding vapor intrusion.

On September 4, the governor of New York signed a bill that may be the first law in the nation that will require landlords to disclose to tenants and prospective tenants known indoor air quality issues when VOCs have been detected in indoor air, sub-slab soil vapor or sub-slab groundwater in excess of applicable state and federal regulatory guidelines. In addition, landlords in New York State will be required to notify tenants and prospective tenants when mitigation measures are used to prevent vapor intrusion from entering the building or when there is ongoing monitoring of such conditions.

At the federal level, there currently is a bill, the Toxic Chemical Exposure Reduction Act of 2007, which is pending before the Senate. This bill proposes, among other things, to amend the federal Safe Drinking Water Act to require the EPA administrator to publish a health advisory and establish reference concentrations for trichloroethylene that fully protect the health of susceptible populations from vapor intrusion, and to apply such reference concentrations to vapor intrusion investigations carried out under CERCLA and the Safe Drinking Water Act.

## PROACTIVE APPROACHES TO IDENTIFYING VAPOR INTRUSION PATHWAYS

Buyers of real property should retain an environmental consultant to perform an environmental site assessment of the target property as part of the due diligence process. If a potential vapor intrusion pathway is identified during the due diligence period, the buyer should work closely with environmental counsel and an environmental consultant to evaluate, among other things: (1) whether the buyer's anticipated use of the property is technically feasible; (2) whether an anticipated development is economically feasible; (3) the potential for third-party liability exposure with respect to building occupants and neighbors; (4) the reasonableness of the purchase price; (5) the effect on the marketability of the property to prospective buyers and tenants; and (6) whether the issue is likely to influence a lender's willingness to provide acquisition or construction financing.

When VOC impacts are identified, an environmental consultant should evaluate the potential for vapor intrusion pathways into buildings by developing a conceptual site model that provides a comprehensive overview of site conditions. The model should incorporate information and data regarding the source of VOC impacts; the vertical and horizontal extent of VOC impacts; whether VOC impacts are migrating and, if so, the direction of such migration; and whether site occupants are directly exposed to the VOCs through ingestion, dermal contact or inhalation of indoor air. For development projects, a conceptual site model can be used in the planning stages to more cost-effectively address vapor intrusion issues. For instance, a conceptual site model can assist the development team in locating occupied structures away from VOC-impacted areas and thus potentially eliminate the need for mitigation systems and institutional controls; incorporating mitigation systems in the building design, resulting in more effective and less costly systems than if retrofitted after building construction; and evaluating whether residential use of a building is technically feasible and cost-effective.

One of the main challenges for an environmental consultant in developing a conceptual site model is determining what type and how much sampling data is appropriate for the model. Sellers are often unwilling to allow a buyer's consultant to take samples to evaluate vapor intrusion pathways due to the possibility that a poorly planned sampling protocol could result in the generation of an incomplete data set that may create uncertainty regarding the seller's obligations and unnecessary concern among building occupants.

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*HIDDEN TRAPS IN FORECLOSING, CONTINUED FROM PAGE 5*

has a similar ordinance restricting eviction of lessees. Section 26-408 of New York City's Administrative Code requires that "[n]o tenant, so long as he or she continues to pay the rent to which the landlord is entitled, shall be removed from any housing accommodation which is subject to rent control" notwithstanding the fact that the tenant has no lease, whether it has expired or was otherwise terminated, and notwithstanding any contract agreement to surrender possession. The impact of such ordinances is not that the lenders cannot foreclose on the premises in case of a default, but that bidding at the foreclosure sale may be dampened by the fact that whoever buys the property may inherit one or more lessees whom the buyer may have difficulty dislodging. Laws and ordinances with similar effects have been proposed in other states.

The recently enacted Emergency Economic Stabilization Act of 2008 echoes such protections for tenants. The act authorizes the Secretary of the Treasury to acquire or insure mortgages, mortgage-backed securities and other assets secured by residential real estate to assist financially troubled homeowners and foster economic stability. With respect to acquired residential mortgages, the secretary will promulgate regulations to minimize home foreclosures and maintain an eye toward preserving tenants' rights. Modifications to acquired residential loans shall ensure, where possible, that bona fide tenants, who are current on their rent, are able to remain in their homes under the terms of the lease. Among other things, any plan implemented by the secretary must also preserve existing federal, state and local residential rental subsidies and protections. The act sets a precedent for curtailing mortgagees' ability to remove lessees who occupy troubled residential rental property. <

*VAPOR INTRUSION, CONTINUED FROM PAGE 10***REMEDICATION, MITIGATION AND BEYOND**

The development of a conceptual site model also includes an evaluation of remediation and mitigation alternatives for eliminating vapor intrusion pathways. The goal of any remediation program is to reduce contaminant levels present in soil and groundwater to levels that are protective of human health, safety and the environment. Eliminating or mitigating the source of VOC impacts is a critical step in eliminating vapor intrusion pathways into a building. There are a variety of remedial alternatives to address VOC contamination. Selecting the optimal remedial alternative depends on several factors, including the nature and extent of contamination, the location of impacted areas, the depth to impacted soil or groundwater, and a consideration of site-specific geology and hydrogeology.

In many cases, it is not economically or technically feasible to reduce contaminant levels in VOC-impacted areas to background levels. Even when achieving background conditions is feasible, it can take many years to accomplish, particularly when dealing with VOC-impacted soil or groundwater beneath a building. Consequently, in addition to remediation, mitigation measures are typically necessary to reduce or eliminate vapor intrusion pathways into a building in order to protect the health and safety of building occupants.

The most commonly used vapor mitigation systems include one or more of the following elements: (1) the installation of synthetic vapor barriers on or below building slabs to physically prevent the migration of vapors into the building; (2) passive ventilation of vapors, which typically uses permeable materials and/or perforated collection pipes to vent vapors away from building interiors or occupied areas; and (3) active systems that use ventilation and fans to reduce pressure in soil gas under the building slab. In addition to remediation and mitigation, institutional controls and deed restrictions—such as activity and use limitations and environmental land use restrictions—are often needed to prohibit certain uses (such as the prohibition of residential use of the ground floor without appropriate mitigation measures) or to require the maintenance and continued use of installed mitigation systems.

In light of the varied, evolving and sometimes conflicting federal, state and private guidance for evaluating vapor intrusion pathways, it is advisable to work with environmental counsel and environmental consultants who are familiar with local regulations to evaluate which methods, if any, are most appropriate for assessing the potential for vapor intrusion issues and the costs and risks posed by such issues. <