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INDOOR AIR

VAPOR INTRUSION

The author of this article says the fundamental flaw of ASTM's vapor intrusion standard is that it presumes the property being investigated has a potential vapor intrusion condition if the property is within a certain distance from the source of a chemical release, or from the leading edge of a contaminant plume, and either no other information is available or certain necessary data are not available. He says the presumptions can cause unnecessary investigation expenses, legal liabilities, and transaction risks. The author recommends presumptions be eliminated in any revision of the standard. He says vapor intrusion assessments should be done by environmental professionals who rely on their expertise and experience and make use of, as appropriate, federal, state, and/or industry guidance.

ASTM Vapor Intrusion Assessment Standard: Inappropriate Presumptions

By EDWARD L. STROHBEHN JR.

In March 2008, ASTM International published its E 2600 *Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions* (VI Standard).¹ The VI Standard provides a multi-tier screening protocol for assessing the potential for vapor intrusion to occur within buildings located on the property being investigated. The

stated purpose of the VI Standard is "to define good commercial and customary practice" for conducting a "vapor intrusion assessment" for use in conjunction with real estate transactions.²

This article addresses five significant flaws in the VI Standard.

The fundamental flaw is that the VI Standard establishes presumptions that the property being investigated has a potential vapor intrusion condition (pVIC) if the property is within a certain distance from the

¹ ASTM E 2600-08, *Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions* (March 2008) (VI Standard).

² VI Standard, Section 1.1.

source of a chemical release, or from the leading edge of a contaminant plume, and either no other information is available or certain necessary data are not available.³ A pVIC is the potential for the presence or likely presence of a chemical of concern in indoor air at the property being investigated at a concentration that “may present an unacceptable health risk to occupants.”⁴ If the VI Standard requires a finding that a pVIC exists, the VI Standard requires the environmental professional doing the vapor intrusion assessment to conclude in the professional’s assessment report that the pVIC exists at the target property even though factual support for that conclusion is lacking.

Sound science and policy counsel against the presumption approach adopted by the VI Standard for making vapor intrusion determinations regarding potential health risks. As the U.S. Environmental Protection Agency (EPA) states in its vapor intrusion guidance:

“The vapor intrusion pathway is complex and, consequently, we recommend that a comprehensive assessment of this pathway using all available lines of evidence be conducted before drawing conclusions about the risks posed by this pathway.”⁵

To address the issues posed by the VI Standard’s presumptions, this article evaluates data upon which the presumptions are based and the logic and reasoning of the standard itself. The basic conclusions are:

- The VI Standard does not constitute good commercial and industry practice for conducting a vapor intrusion assessment of a property.⁶
- The presumptions are not based on sound science and policy and are subject to significant flaws.
- The presumptions can result in unnecessary investigation expenses, legal liabilities, and transaction risks.
- As a result, the presumptions should be eliminated in any revision of the VI Standard.
- When conducting a vapor intrusion assessment, rather than following the VI Standard’s requirements, the assessment should be performed by expert environmental professionals who rely on their vapor intrusion expertise and experience and make appropriate use of federal and/or state agency vapor intrusion guidance.

³ *Id.* at Sections 3.2.34, 8.5.3, 8.6, 9.4.

On April 9, 2009, the chair of the Vapor Intrusion Task Force of ASTM Subcommittee E50:02 issued proposed revisions to the E 2600-08 VI Standard for balloting by subcommittee members. The proposed revisions would change some of the specific sections, language, and other aspects of the VI Standard that are addressed in this article. However, the proposed revisions have not been adopted and are not part of E 2600-08, which is what currently is being applied. In addition, even if the changes were adopted, they would not remedy the fundamental flaw posed by basing vapor migration determinations on presumptions, which remains in the proposed revisions.

⁴ *Id.* at Section 3.2.34 (emphasis added).

⁵ U.S. EPA, *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, (Subsurface Vapor Intrusion Guidance)* (November 2002) (EPA Draft VI Guidance), at 21, available on the Web at <http://epa.gov/osw/hazard/correctiveaction/eis/vapor.htm>.

⁶ As the discussion below shows, the VI Standard is not based on a distillation of the best practices from existing industry and/or government agency vapor intrusion assessment procedures.

Five Significant Flaws in the VI Standard

The VI Standard has five significant flaws:

- In certain situations, the VI Standard requires a determination that a pVIC exists by presumption, without the exercise of professional judgment. As a result, pVIC presumptions are inconsistent with the VI Standard’s fundamental premise that “[n]o practical standard can be designed to eliminate the role of professional judgment and the value and need for experience in the party performing the inquiry. The professional judgment of an environmental professional is, consequently, vital to the performance of this assessment.”⁷

- The VI Standard produces a pVIC determination for a situation in which it is likely a vapor intrusion condition is improbable. Not only is this bad science, this result also is inconsistent with the VI Standard’s fundamental conclusion that “[a] condition determined to be de minimis is not a pVIC.”⁸

- The VI Standard Tier I presumption process likely screens in—rather than out—target properties with a low risk of vapor intrusion. This is contrary to the specific objective of the VI Standard “that properties with a low risk of vapor intrusion can be screened out quickly and inexpensively as the data justify.”⁹

- The VI Standard establishes an unscientific—and bad policy—requirement that obligates an environmental professional to make a pVIC determination that a potentially unacceptable human health risk exists at a target property based solely on a presumption. No federal or state agency vapor intrusion guidance uses presumptions like the VI Standard presumptions to make health risk determinations. In fact, federal and state agency vapor intrusion guidance counsel against such an approach.

- The VI Standard pVIC presumption determination can result in unnecessary investigation expenses, legal liabilities, and transaction risks. This is inconsistent with a fundamental objective of the VI Standard “to ensure that the process for assessing vapor intrusion is practical and reasonable.”¹⁰

These flaws are addressed in detail below.

What is Vapor Intrusion?

Vapor intrusion occurs when chemicals migrate into a building. The vapor intrusion issue addressed by the VI Standard is intrusion that results from the volatilization of chemicals from groundwater or soil beneath or in close proximity to the building. The presence of chemicals in indoor air also can result from migration from outdoor air and from volatilization of chemicals from sources within a building. Determining the source of chemicals detected in indoor air from these potential sources—indoor sources; outdoor air; and groundwater, soil gas, and/or underground soil—is difficult. This is one reason why indoor air vapor intrusion assessments should be performed by environmental experts who select quality data gathering and analytic techniques to produce sound results.

⁷ VI Standard, Section 4.3 (emphasis identifying defined terms omitted).

⁸ *Id.* at Section 3.2.16 (emphasis identifying defined terms omitted).

⁹ *Id.* at Section 7.1.

¹⁰ *Id.* at Section 1.3.

The vapor intrusion exposure pathway was poorly understood until fairly recently. Also, over the past few years vapor intrusion from contaminated groundwater and soil has become of increased concern to environmental regulators, lenders, and property owners and buyers. This is because chemical concentrations have been detected in buildings that can cause unacceptable human health risk.¹² Moreover, these high chemical concentrations have been found in buildings at contaminated sites for which the relevant agency had determined remediation was complete and closed the cases.¹³

As a result, the EPA and more than 25 states have developed vapor intrusion assessment guidance, policies, and/or regulatory requirements.¹⁴ Furthermore, ASTM has developed its VI Standard.

VI Standard's Procedures

The VI Standard establishes procedures for conducting a vapor intrusion assessment of a property involved in a real estate transaction.¹⁵ The standard creates a four-tier vapor intrusion screening protocol, provides detailed guidance for the sources and types of information to be used in conducting the vapor intrusion assessment, prescribes the content and format of the vapor intrusion assessment report, and discusses the relationship between the VI Standard and ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (Nov. 2005) (Phase I ESA).

Tier 1 is similar in approach to, and can use information developed as part of, a Phase I ESA to determine if a pVIC exists. Tier 1 requires (i) review of information specified in the VI Standard, such as government and other available records for the property being assessed and for certain properties within specified distances of the property; (ii) the performance of three tests (called the chemicals of concern test, plume test, and search distance test); and (iii) other evaluations.¹⁶ For example, the plume test involves determining if the lineal

distance from the nearest edge of a contaminated groundwater plume to the nearest existing or planned structure on the property is less than a specified distance and, if so, whether risk-based concentrations are exceeded for chemicals of concern.¹⁷ The Tier 1 conclusion is either that a pVIC exists or vapor intrusion is unlikely to be an issue.¹⁸

For the Tier 1 determination, particularly important are the following three presumptions:

■ “Should a known or suspect source of contamination exist up-gradient of the target property in the area of concern [i.e., within 1 mile or 1/2 mile of the property, depending upon the source] with chemicals of concern suspected to be present, a pVIC is presumed to exist if no further information is available.”¹⁹

■ “If the lineal distance in any direction from the nearest edge of a contaminated plume to the nearest existing or planned structure on the target property . . . is less than the 100 ft., except that for dissolved petroleum hydrocarbon chemicals of concern in which case if this lineal distance is less than 30 ft., then it is presumed that a pVIC exists.”²⁰

■ “Should a known or suspect source of soil or groundwater contamination with chemicals of concern suspected to be present exist down-gradient or cross-gradient within the critical distance [i.e., the 100 ft. and 30 ft. criteria above] of the target property, a pVIC is presumed to exist if no further information is available.”²¹

Interestingly, the other Tier 1 presumption seemingly is inconsistent with the first presumption quoted above. The other Tier 1 presumption reads:

“If the lineal distance between the nearest edge of the contaminated plume and nearest existing or planned structure on the target property . . . is greater than or equal to 100 ft, or 30 ft for dissolved petroleum hydrocarbon chemicals of concern, then it is presumed unlikely that a pVIC will exist in current or planned structure(s) on the target property.”

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This presumption casts doubt on the technical validity of the area-of-concern distance test for establishing a pVIC is presumed to exist because the “area of concern” encompasses a significantly bigger area than the 100-foot and 30-foot critical distance limits.

If the VI Standard vapor intrusion assessment is performed independently of a Phase I ESA and a pVIC determination presumption applies, the environmental professional is required to report the pVIC in its assessment report. Then the person commissioning the VI Standard Tier 1 assessment (the user), with assistance from the environmental professional, “shall decide

¹² EPA Draft VI Guidance, *supra* note 5 at 5.

¹³ Bibler, Kirsch & Courchesne, “New ASTM Standard Provides Limited Tool For Assessing Vapor Intrusion Risks,” (39 ER 1790, 9/5/08) ; Dechert LLP, *DechertOnPoint* (Aug. 2008), Special Alert, at p. 1.

¹⁴ See federal and state agency vapor intrusion guidance documents listed in VI Standard, App. X9.2 “U.S. EPA Documents,” App. X9.3 “Other Federal Agency Guidance,” and App. X9.4 “State Agency Documents.”

¹⁵ VI Standard, Section 1.1. The standard defines a “vapor intrusion assessment (VIA)” as “an assessment of the potential for COC [chemicals of concern] vapors released from contaminated soil or groundwater to impact the indoor air environment of a structure to present a health risk to occupants. The objective of a VIA is to determine if a pVIC or VIC exists.” *Id.* at Section 3.2.54. Despite defining the purpose and objective of the VI Standard as being to conduct a “vapor intrusion assessment,” the VI Standard provides for and outlines what it characterizes as “pre-emptive” mitigation actions that can be taken even if a VIC has not been determined to exist. See *id.* at Sections 8.7.2, 9.6. Moreover, the term “vapor intrusion assessment” is the formal name of the VI Standard and is used throughout the text. The standard prescribes evaluation and investigation techniques and provides recommendations for remedial actions that are not consistent with a simple “screening” process. This, too, is a significant flaw in the VI Standard.

¹⁶ See *id.* at Section 8.

¹⁷ *Id.* at Section 8.5.2. Risk-based concentrations (RBCs) can be federal or state generic policy/regulation/guidance RBCs or site-specific RBCs developed by an environmental professional. *Id.*

¹⁸ *Id.* at Section 3.2.34, 8.6.

¹⁹ *Id.* at Section 8.6 (emphasis added; emphasis identifying defined terms omitted).

²⁰ *Id.* at Section 8.5.3 (emphasis added; emphasis identifying defined terms omitted).

²¹ *Id.* at Section 8.6 (emphasis added; emphasis identifying defined terms omitted).

²² *Id.* at Section 8.5.3 (emphasis added; emphasis identifying defined terms omitted).

what further investigation is appropriate.”²³ The VI Standard notes two possible alternatives: proceed to a Tier 2 evaluation or proceed directly to Tier 4 preemptive mitigation.²⁴

Tier 2 applies semi-site-specific numeric screening criteria to existing or newly collected groundwater, soil, and/or soil gas test results to assess whether a pVIC exists.²⁵ For example, the numeric screening process uses the size of the contaminated plume and the concentration of chemicals of concern in the plume to make numerical pVIC determinations required by the plume test and the risk-based concentration (RBC) test.²⁶ The RBC test uses either generic RBCs from federal or state guidance/policy/regulation or site-specific RBCs developed by the environmental professional.²⁷

For the Tier 2 determination, particularly important is the following presumption: If the property is within the specified critical distance of a contaminated plume, and if data is not available to conduct the RBC test, then “a pVIC is presumed to exist.”²⁸

If a pVIC exists, then the user can conduct additional investigation (Tier 3) or may “proceed pre-emptively directly to mitigation (Tier 4)” or may choose not to proceed with the transaction.²⁹

Interestingly, the other Tier 2 presumption is seemingly inconsistent with the first Tier 1 presumption quoted above. The other Tier 2 presumption reads:

If the plume test identifies the distance between the nearest edge of the contaminated plume and the nearest existing or planned structure on the target property . . . as equal to or greater than the critical distance, then a pVIC is unlikely to exist . . .

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For the reasons discussed above, this presumption casts doubt on the technical validity of the area-of-concern distance test for establishing the presumption that a pVIC exists.

Tiers 3 and 4 are non-scope considerations and are not required elements of the VI Standard assessment.³¹ Tier 3 is a more sophisticated form of testing than Tier 2 and is conducted to determine if a vapor intrusion condition (VIC) exists.³² Tier 3 testing could include indoor air testing.³³ Tier 4 consists of mitigation methods for addressing pVICs or VICs such as institutional controls (e.g., a deed restriction) or engineering controls (e.g., conducting source removal or treatment, installing vapor barriers or active vapor collection and venting systems, pressurizing building interiors).³⁴

²³ *Id.* at Section 8.7.2 (emphasis added).

²⁴ *Id.* If the VI Standard vapor intrusion evaluation is done as a supplement to a Phase I environmental assessment and a pVIC is determined to exist, the VI Standard states that the user and environmental professional can decide “what further investigation, if any, should be undertaken.” *Id.* at Section 8.7.1. The VI Standard also requires that the pVIC “shall be identified as a REC and the pVIC discussed.” *Id.*

²⁵ *See id.* at Section 9.

²⁶ *Id.* at Section 9.1

²⁷ *Id.*

²⁸ *Id.* at Section 9.4 (emphasis added).

²⁹ *Id.* at Section 9.6.

³⁰ *Id.* at Section 9.4 (emphasis added; emphasis identifying defined terms omitted).

³¹ *Id.* at Section 13.3.4.

³² *Id.* at Section 10.1.

³³ *Id.*

³⁴ *See id.* at Section 11.

The sources and types of information to be used for conducting the VI Standard vapor intrusion assessment include information gathered from conducting a tour of the property being assessed (target property) and the surrounding area as well as information collected from federal, state, and local government records and historical records for the target property and surrounding area, including aerial photographs, fire insurance maps, local street directories, and USGS topographic maps.³⁵

The VI Standard recommends the VI Standard vapor intrusion assessment report follow the recommended format set out in Appendix X4.³⁶

ASTM E 1527-05 Phase I Site Assessment

In Section 5.1, the VI Standard discusses the relationship between the VI Standard and the Phase I ESA. The discussion leaves unclear whether it is appropriate to consider vapor intrusion issues as part of a Phase I ESA. The Section 5.1 discussion might be interpreted, when considered with the discussion in Sections 1.1 and 1.2 of the relationship between the VI Standard and the Phase I ESA, to mean ASTM considers vapor intrusion concerns are properly addressed only under the VI Standard.³⁷ This is inappropriate and incorrect. The Phase I ESA explicitly includes vapor intrusion within the definition of a “recognized environmental condition” (REC). A REC is defined by ASTM as “the presence or likely presence of any hazardous substances . . . under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances . . . into structures on the property or into the ground, ground water, or surface water of the property.”³⁸

³⁵ *See id.* at Sections 8.1-8.4.

³⁶ *See id.* at Section 12 and App. X4. The report format consists of eleven sections: Summary, Introduction, Site Description, User Provided Information, Records Review, Findings and Assessment of the Vapor Intrusion Pathway, Conclusions/Opinion, References, Signature(s) of Environmental Professional(s), Qualifications of Environmental Professional(s), and Appendices.

³⁷ The VI Standard states that “[i]ndoor air quality, and therefore vapor intrusion as a contributing indoor air quality issue, is a non-scope consideration in a Phase I conducted in accordance with the Practice E 1527 standard.” *Id.* at Section 5.1 The VI Standard concludes its discussion of the relationship between the E 1527-05 Phase I ESA and the VI Standard by stating: “This practice is not meant to preclude an environmental professional from providing a professional opinion in the Phase I ESA on the impact of potential vapor migration onto a target property if deemed necessary to satisfy ‘all appropriate inquiry.’” *Id.* See Bibler, Kirsch & Courchesne, “New ASTM Standard Provides Limited Tool For Assessing Vapor Intrusion Risks” *supra* note 13 (“The ASTM [VI] Standard makes clear that vapor intrusion issues are not within the scope of a Phase I and should be addressed instead through a vapor intrusion assessment conducted under the ASTM [VI] Standard.” (emphasis added)). For a detailed discussion of the significant problems posed by the VI Standard Section 5.1 discussion of the relationship between the VI Standard and the E 1527-05 Phase I ESA, see Roe, “New ASTM Standard for Assessment of Vapor Intrusion: More Harm Than Good?” (39 ER 1027, 5/23/08), section captioned “The Standard Inappropriately and Unnecessarily Undermines E 1527-05 and Creates Confusion About Its Own Relationship to All Appropriate Inquiries.”

³⁸ ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Pro-*

Accordingly, the VI Standard Section 5.1 discussion and any other discussions of or references to the relationship between the VI Standard and the Phase I ESA should be deleted in any revision of the VI Standard.

Analysis of VI Standard Flaws

Analysis of the VI Standard reveals five significant flaws that underscore why the VI Standard does not provide a reasonable and practical process, and a good commercial and customary practice, for evaluating vapor intrusion as part of a transaction screening process.

Presumptions Preclude Professional Judgment

To evaluate the implications of the pVIC presumptions, consider the following Tier 1 Screening case as an example. If a leaking underground storage tank (LUST) at a gasoline station is identified on a state LUST list, the LUST site is located one-half mile (2,640 feet) upgradient of the target property, and no other information is available, a pVIC is presumed to exist at the target property. In this situation, for a VI Standard assessment conducted independently of a Phase I ESA, the VI Standard requires that:

(1) the environmental professional “shall submit the VIA report to the user . . . with the conclusion that a pVIC exists and why,”³⁹ and

(2) the user, working with the environmental professional, “shall decide what further investigation is appropriate.” The VI Standard offers two alternative actions: (i) to proceed to a Tier 2 evaluation, or (ii) proceed directly to Tier 4 preemptive mitigation.⁴⁰

For VI Standard Tier 1 assessments commissioned by prospective purchasers, the purchaser would not likely undertake preemptive mitigation and may have little interest in undertaking additional investigation, particularly if invasive testing is necessary. Thus, if a pVIC is found, the likely final result of the Tier 1 assessment by a prospective purchaser is a final VI assessment report signed by the environmental professional with the conclusion that a pVIC exists at the property.

This pVIC presumption is inconsistent with the VI Standard fundamental policy that the “professional judgment of an environmental professional is . . . vital to the performance of this assessment.”⁴¹ For the LUST Site example, the information relied on—simply that a

cess (Nov. 2005) Sections 1.1 (Purpose), 3.2.74 (Definition) (emphasis added; emphasis identifying defined terms omitted).

³⁹ VI Standard, Section 8.7.2.

⁴⁰ *Id.* Interestingly, for the conclusion of the Tier 1 screening, the VI Standard does not offer the alternative of not proceeding with the transaction. For the conclusion of the Tier 2 screening, the alternative of not proceeding with the transaction is provided.

⁴¹ *Id.* at Section 4.3. (emphasis identifying defined terms omitted). Note that in describing the role of the environmental professional in conducting a Tier 1 Screening, the VI Standard states that:

“Professional judgment should be applied in Tier 1 as part of a pVIC determination, for example *when distances exceed the approximate minimum search distance . . .*”

The implication is that for suspect sources within the VI Standard-prescribed approximate minimum search distance, application of professional judgment is not necessary. This approach is consistent with the Tier 1 pVIC presumption but still

LUST site exists one-half mile upgradient—makes it highly unlikely chemicals of concern are located beneath or within sufficient proximity to the target property at concentrations that present or may present a potentially unacceptable risk to occupants of the property.⁴² If the environmental professional has agreed to provide its vapor intrusion assessment (VIA) report based on the prescribed VI Standard Tier 1 procedures, the VI Standard directs the environmental professional to presume—and not to exercise professional judgment—that a pVIC exists and issue its VIA report with that conclusion.⁴³

Similarly, if the environmental professional conducts a vapor intrusion evaluation for a target property that results in triggering the other Tier 1 pVIC determination presumptions or the Tier 2 pVIC determination presumption (these presumptions are quoted in Section D above), and the scope of the environmental professional’s assignment is not to conduct further investigation, then the VI Standard’s procedures for preparing VIA reports results in the environmental professional concluding, i.e., presuming and not exercising professional judgment, that a pVIC exists for the target property.⁴⁴

The basic scientific flaw of the VI Standard’s reliance on presumptions to determine if a pVIC exists at a target property is underscored by Colorado’s Indoor Air Guidance, which states:

“It should not be automatically presumed that vapor intrusion is occurring at a building located over a contaminant plume: other lines of evidence may be used to demonstrate otherwise.”⁴⁵

inconsistent with the basic policy that professional judgment is “vital” to the performance of the VI Standard assessment.

⁴² See the fact analysis below that produces this conclusion.

⁴³ It is appropriate to note the VI Standard provides an ambiguous statement about the role of the environmental professional in evaluating records obtained from a government records review. The VI Standard states: “If a standard environmental record source . . . identifies the target property or another site within the approximate minimum search distance defined by this practice, *the report shall include the environmental professional’s judgment* about the significance of the listing with respect to analysis of pVICs in connection with the target property.”

There is tension between this section, which provides a general requirement about the environmental professional’s responsibility for evaluating the “significance” of a record, and the specific requirement of the presumption section, which could be based on a governmental record and requires the environmental professional to determine a pVIC exists if certain specified distance criteria are met and other information is not available. A reasonable interpretation of these two sections is that the specific requirements of the presumption section are not vitiated by the general significance evaluation criteria, thus enabling the presumption to apply and have meaning within the VI Standard.

⁴⁴ As discussed above, the conclusions in VI Standard Sections 8.5.3 and 9.4 that “it is presumed unlikely that a pVIC will exist” in the situation where the lineal distance between the edge of the contaminated plume and the nearest target property boundary is greater than or equal to 100 feet, or 30 feet for dissolved petroleum hydrocarbon chemicals of concern, casts doubt on the validity of the Section 8.6 pVIC presumption a pVIC exists if the distance from the target property to the source of a release is one-half mile or 1 mile, depending upon the type of source.

⁴⁵ Colorado Dept. of Public Health and Environment, *Draft Indoor Air Guidance* (Sept. 2004) (Colorado VI Guidance), at

The importance of using professional judgment to make pVIC determinations is confirmed by the discussion in Section (e)(4) below. That discussion demonstrates:

- No federal or state agency vapor intrusion guidance establishes pVIC presumption determination criteria like those in the VI Standard.
- Federal and state agency guidance counsel using weight-of-evidence and comprehensive factual evaluations to make vapor intrusion condition determinations.
- Federal and state agency guidance emphasize the importance of relying on professional judgment for conducting vapor intrusion evaluations and making conclusions about whether a vapor intrusion condition exists that poses a potentially unacceptable health risk to occupants of a building.

In sum, the VI Standard Tier 1 and Tier 2 pVIC determination presumptions inappropriately can require conclusions that a target property has a pVIC condition without the exercise of professional judgment. These presumptions are inconsistent with the VI Standard's fundamental policy that:

“No practical standard can be designed to eliminate the role of professional judgment and the value and need for experience in the party performing the inquiry. The professional judgment of an environmental professional is, consequently, vital to the performance of this assessment.”⁴⁶

A De Minimis Condition Can Be a pVIC

As shown above, in the absence of other information, identifying a LUST on a state LUST list one-half mile (2,640 feet) upgradient of the target property results in the presumption that a pVIC condition exists at the target property, i.e., there may be a potentially unacceptable health risk to occupants of the property. As shown below, it is highly unlikely, if not improbable, that a LUST site located 2,640 feet upgradient of the target property would result in vapor intrusion within a building on the target property that poses a potentially unacceptable health risk to building occupants. The VI Standard transforms what is a highly unlikely and, in some instances, an improbable occurrence (which would not rise to the threshold of a de minimis situation) into a determination that a pVIC does exist at the target property. This result not only is bad science, it also is contrary to the explicit VI Standard requirement that “a condition determined to be de minimis does not represent a pVIC.”⁴⁷

As discussed below, two types of data confirm that the LUST site example above and other instances in which the target property is more than 100 feet downgradient from the leading edge of a VOC contaminated plume (or 30 feet from the leading edge of a dissolved petroleum hydrocarbon plume) are unlikely to pose a vapor intrusion risk that reasonably needs to be evaluated. The VI Standard, however, establishes pVIC presumption determination criteria that result in a pVIC finding for these situations.

¹⁹ (emphasis added), available on the Web at <http://www.cdph.state.co.us/hm/indoorair.pdf>.

⁴⁶ VI Standard, Section 4.3 (emphasis identifying defined terms omitted).

⁴⁷ *Id.* at Section 1.1; See also *id.* at Sections 3.2.16, 3.2.34.

Plume Length and Chemical Concentration Data. The American Petroleum Institute Bulletin, *Characteristics of Dissolved Petroleum Hydrocarbon Plumes*,⁴⁸ cited in the VI Standard Supplemental Bibliography, is one of the data sources used by ASTM.

This bulletin documents that 72 percent of petroleum hydrocarbon plumes are 200 feet or less in length, 86 percent are 300 feet or less in length, and 91 percent are 400 feet or less in length. More importantly, only 2 percent of petroleum hydrocarbon plumes are longer than 900 feet. Based on these data, it is likely far less than 1 percent of petroleum hydrocarbon plumes are 2,640 feet in length or would even reach the target property. This fact alone establishes a condition that would not rise to the level of a de minimis condition.

Of the 604 sites analyzed in the bulletin, 488 (or 81 percent) are based on detections of benzene at a detection limit of 10 parts per billion; 74 sites (or 12 percent) are based on benzene and benzene, toluene, ethylbenzene, and xylene (BTEX) constituents with detection limits ranging from 1 ppb to 50 ppb, and 42 sites (or 7 percent) are based on mostly benzene and BTEX constituents with no reported detection limit.

In *An Overview of State Approaches to Vapor Intrusion* by Eklund, Folkes, Kabel and Farnum, the authors report that “[a]s part of the effort to develop an ASTM method for VI, we have reviewed the various state guidance documents and tabulated key information. . . .”⁴⁹ The authors identified 17 states that had established residential screening levels for selected volatile organic compounds (VOCs). Of these 17 states, the residential screening level for benzene in groundwater for 11 states ranged from 15 ppb to 5,600 ppb. For two states, the residential screening level for benzene was 5 ppb, and for four states residential screening levels had not been established for benzene.

Thus, in 85 percent of the states the residential screening levels are from 1.5 to 560 times higher than the benzene detection limits for the plumes analyzed in the API Bulletin. This means for most of the states with vapor intrusion guidance there only is a miniscule probability a hydrocarbon plume from a LUST site located one-half mile upgradient of the target property would result in vapor intrusion at the target property with chemical concentrations at levels that might present a potentially unacceptable health risk to target building occupants.

Vapor Migration From Groundwater Plumes. EPA’s draft vapor intrusion guidance,⁵⁰ which ASTM considered in developing the VI Standard,⁵¹ addresses the question of whether the target property is “located . . . above or in close proximity to subsurface contamination that potentially could result in unacceptable indoor air inhalation risks.”⁵² This language is strikingly similar to the VI Standard definition of a pVIC.

⁴⁸ American Petroleum Institute, *Characteristics of Dissolved Petroleum Hydrocarbon Plumes*, Bulletin No. 8 (December 1998, Vers. 1.1).

⁴⁹ Eklund, Folkes, Kabel and Farnum, *An Overview of State Approaches to Vapor Intrusion*, Environmental Management (American Waste Management Association, February 2007), at 10.

⁵⁰ EPA Draft VI Guidance, *supra* note 5.

⁵¹ VI Standard, App. X5, at 39.

⁵² EPA Draft VI Guidance, *supra* note 5 at 16.

But contrary to the VI Standard distance criteria approach for determining if a pVIC exists, EPA concludes the following:

“Available information suggests that 100 feet laterally and vertically is a reasonable criterion when considering vapor migration fundamentals, typical sampling density, and uncertainty in defining the actual contaminant spatial distribution. The recommended lateral distance is supported by empirical data from Colorado sites where the vapor intrusion pathway has been evaluated. At these sites, no significant indoor air concentrations have been found in residences at a distance greater than one house lot (approximately 100 feet) from the interpolated edge of ground water plumes.”

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ASTM reported the vapor intrusion guidance of six states “effectively defer[s] to the EPA guidance.”⁵⁴

Several other states address the question of how far from the edge of a groundwater plume is it reasonable to conclude vapor migration would not occur that potentially could result in unacceptable health risks in indoor air. For example, Pennsylvania states: “A horizontal distance of 100 feet from the source to the receptor (inhabited building) was chosen as the criterion to define when sites were close enough and so needed to be addressed for vapor intrusion.”⁵⁵

Indiana states, for VOCs and BTEX: “Contaminated ground water greater than 100 feet [for VOCs] [50 feet for BTEX compounds] from an occupied building is not expected to pose a threat unless preferential pathways are present connecting the contaminated ground water and the building.”⁵⁶

Colorado states, for VOCs: “Are buildings currently located (or proposed to be located) above or within 100 feet of the edge of this contamination? (If yes, continue; if no, an indoor air assessment is probably not necessary.)”⁵⁷

Vapor intrusion guidance for Delaware, Kansas, New Hampshire, and New Jersey provide similar conclusions.⁵⁸

⁵³ *Id.* at 17 (emphasis added). EPA noted that if there are significant preferential pathways, then evaluation should occur at distances greater than 100 feet. EPA did not specify a distance. EPA provided examples of such pathways, such as fractures, macropores, and utility conduits.

⁵⁴ VI Standard, at 39 (Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee).

⁵⁵ Pennsylvania Department of Environmental Protection, *Land Recycling Program Technical Guidance Manual—Section IV.A.4 Vapor Intrusion into Buildings from Groundwater and Soil Under the Act 2 Statewide Health Standard* (Jan. 2004) at 3 (emphasis added), available on the Web at <http://www.depweb.state.pa.us/ocrlgs/cwp/view.asp?a=1459&q=518990>.

⁵⁶ Indiana Department of Environmental Management, *Draft Vapor Intrusion Pilot Program Guidance* (April 26, 2006), at 4, 16 (emphasis added), available on the Web at <http://www.in.gov/idem/files/la-073-gg.pdf>.

⁵⁷ Colorado VI Guidance, *supra* note 45 at 3 (emphasis added).

⁵⁸ Delaware Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch, Memorandum titled “Policy Concerning the Investigation, Risk Determination and Remediation for the Vapor Intrusion Pathway,” (March 2007) at 3, available on the Web at <http://www.dnrec.state.de.us/DNREC2000/Divisions/AWM/sirb/policy%20concern07008.pdf>; Kansas Department of Health and Environment, Division of Environment, Bureau of Envi-

In brief, for VOCs, EPA and state vapor intrusion guidance concludes that a contaminant plume whose leading edge is more than 100 feet from the target property (and for BTEX compounds, a contaminant plume whose leading edge is more than 30 to 50 feet from the target property) *does not reasonably need to be evaluated* as a potential source of vapor intrusion because the contaminant plumes are not expected to pose a potentially unacceptable health risk to occupants.

In sum, if a VOC source or the leading edge of a VOC plume is more than 100 feet from the target property, EPA and state agency guidance conclude vapor intrusion evaluation is not reasonably necessary because these plumes have not produced significant indoor air concentrations.⁵⁹ Thus, these plumes and sources pose in many, and possibly most, cases no more than a de minimis vapor intrusion risk. Under the VI Standard, however, the environmental professional would have to find a pVIC exists if no further information is available. This is contrary to the explicit VI Standard statement that “a condition determined to be de minimis is not a pVIC.”⁶⁰

ASTM Tier 1 Screening Likely Screens in Properties With Low Risk of Vapor Intrusion

As shown above, EPA and state agency vapor intrusion guidance concludes it is not reasonably necessary to conduct vapor intrusion assessments of target properties more than 100 feet from the leading edge of a VOC contaminated plume or more than 30 to 50 feet from the leading edge of a petroleum hydrocarbon contaminated plume.⁶¹ For such properties, the probability vapor intrusion could result in a potentially unaccept-

ronmental Remediation, *Kansas Vapor Intrusion Guidance: Chemical Vapor Intrusion and Residential Indoor Air* (June 2007) at 7, available on the Web at http://www.kdheks.gov/ber/download/Ks_VI_Guidance.pdf; New Hampshire Department of Environmental Services, Waste Management Division, *Vapor Intrusion Guidance* (July 2006) at 6, available on the Web at http://des.nh.gov/organization/divisions/waste/hwrb/documents/vapor_intrusion.pdf; New Jersey Department of Environmental Protection, *Vapor Intrusion Guidance* (October 2005) at 26-27, available on the Web at <http://www.nj.gov/dep/srp/guidance/vaporintrusion/vig.htm>.

⁵⁹ Where preferential pathways are identified, exceptions to these distance criteria are provided in some of the guidance documents. For example, the EPA Draft VI Guidance provides exceptions for significant preferential pathways. See discussion in note 53 *supra*.

⁶⁰ VI Standard, Section 3.2.34. See also Sections 1.1.1 (“A condition determined to be *de minimis* does not represent a VIC.”), 3.2.16 (“A condition determined to be *de minimis* is not a pVIC or a VIC.”). Note the VI Standard pVIC presumption determinations also are not consistent with the specific intent of the VI Standard as described by the chairman of the VI Standard Task Group: “The specific intent was to establish a methodology to determine whether or not there is a reasonable probability that vapor intrusion could present an environmental risk and liability.” AEC News, *ASTM Int’l Issues Standard for Assessment of Potential Vapor Intrusion into Structures—ASTM E 2600* (March 6, 2008), quoting Chairman Buonicore, available on the Web at <http://aec.ih.com/news/2008/astm-assessment-vapor-intrusion-structures.htm>.

⁶¹ Where preferential pathways are identified, exceptions to these distance criteria are provided in some of the guidance documents. For example, the EPA Draft VI Guidance provides exceptions for significant preferential pathways. See discussion *supra*, note 53.

able health risk to occupants of the properties is unlikely.

However, for a VI Standard Tier 1 Initial Screening vapor intrusion assessment, because of the pVIC presumption criterion, if no further information is available, the VI Standard results in a determination that a pVIC exists at a target property if the target property is located within one mile of certain types of listed sites (e.g., a superfund site) and within one-half mile of other types of listed sites (e.g., a state LUST site).⁶²

In addition, if the leading edge of a groundwater plume containing chemicals of concern is within 100 feet of the target property for VOCs (and 30 feet for petroleum hydrocarbons), for a Tier 1 screening assessment, the VI Standard requires the presumption a pVIC exists for the target property. However, Colorado's vapor intrusion guidance states it "*should not automatically be presumed* that vapor intrusion is occurring at a building located over a contaminant plume."⁶³

Therefore, under the VI Standard Tier 1 vapor intrusion screening procedure, the standard's criteria for presuming a pVIC exists for a target property likely screens in—rather than out—target properties with a low risk of vapor intrusion that would cause potentially unacceptable health risks to occupants of the target property. This result is contrary to the VI Standard objective that "[t]he [VI Standard] practice is a tiered process so that properties with a low risk of vapor intrusion can be screened out quickly and inexpensively as the data justify."⁶⁴

Guidance Does Not Establish Presumptions

None of the state agency vapor intrusion guidance documents listed in the VI Standard appendix of State Agency Documents uses presumptions like the VI Standard presumptions for determining the existence of a vapor intrusion condition that poses or may pose a potentially unacceptable health risk to building occupants.⁶⁵ The vapor intrusion evaluation technical approach generally established by agency guidance documents is to pursue a measured, step-by-step analytic framework in which professional judgment is essential and health-risk conclusions result from an evaluation of the weight of the evidence and the application of quantitative criteria.

In EPA's guidance for evaluating vapor intrusion, the "Tier 2 - Secondary Screening" section states:

"The vapor intrusion pathway is complex and, consequently, we recommend that a *comprehensive assessment* of this pathway *using all available lines of evidence* be conducted *before drawing conclusions about the risks* posed by this pathway."⁶⁶

Alaska's vapor intrusion guidance states:

"These are generalized guidelines and do not address site-specific conditions. Until there is more explicit guidance available, the ADEC project manager or site investiga-

tor should *apply these guidelines with best professional judgment* and a thorough understanding of site-specific conditions *using a weight-of-evidence approach.*"

67

Colorado's Indoor Air Guidance states:

"It *should not be automatically presumed* that vapor intrusion is occurring at a building located over a contaminant plume: other lines of evidence may be used to demonstrate otherwise."

68

In sum, no state has established pVIC presumptions like those established by the VI Standard. Instead, federal and state agency guidance require the use of best professional judgment and careful, thorough assessments relying on a weight of evidence approach and quantitative analyses.

Unnecessary Expenses, Liabilities, and Risks

As shown above, VI Standard Tier 1 presumed pVICs can be determined to exist for a target property in many situations in which it is highly unlikely the supposed groundwater plume would reach or come within close proximity to the target property. VI Standard Tier 2 presumed pVICs also can be determined to exist in situations in which there may be a low likelihood of vapor intrusion occurring within a target property building at concentrations that may pose a potentially unacceptable health risk for occupants. In these situations, the likely result of the VI Standard pVIC presumptions is the imposition of unnecessary investigation expenses, legal liabilities, and/or transaction risks for the buyer and/or the owner/lessee of the target property. This outcome is at odds with a fundamental objective of the VI Standard "to ensure that the process for assessing vapor intrusion is practical and reasonable."⁶⁹

Unnecessary Liabilities for Owners/Lesseees of Property.

As shown above, for the Tier 1 "area of concern"-based pVIC presumption, a VI Standard Tier 1 screening may result in a pVIC condition determination for a target property in a situation where it is highly unlikely a vapor intrusion condition exists. Similarly, for the Tier 1 and Tier 2 "critical distance"-based pVIC presumption determinations, a vapor intrusion condition may not exist. A pVIC determination means, however, that chemicals of concern are present on or within close proximity of the target property at concentrations that "*present[] or may present an unacceptable health risk to occupants*" of the target property.⁷⁰ Thus, if a pVIC condition is presumed to exist for a target property, the owner and/or lessee (collectively "owner") of the target property now is faced with several legal concerns.

First, the owner faces the issue of whether it has a legal duty to disclose to occupants of the property they may have been subject to a potentially unacceptable health risk. Second, the owner faces the issue whether it has a legal duty to determine with certainty whether

⁶² VI Standard, Sections 8.3.3, 8.6.

⁶³ Colorado VI Guidance, *supra* note 45 at 19 (emphasis added).

⁶⁴ VI Standard, Section 7.1 (emphasis added).

⁶⁵ See references to agency guidance cited in VI Standard Appendix X.5 ("Federal and State Agency Vapor Intrusion Web Resources") and Appendix X.9.4 ("Supplemental Bibliography—State Agency Documents").

⁶⁶ EPA Draft VI Guidance, *supra* note 5 at 21. (emphasis added).

⁶⁷ Alaska Dept. of Environmental Conservation, *Evaluation of Vapor Intrusion Pathway at Contaminated Sites* (Guidance No. SPAR) (June 28, 2004), at 2-3 (emphasis added), available on the Web at http://www.dec.state.ak.us/spar/csp/guidance/draft_vap_intr_tm_6_28.doc.

⁶⁸ Colorado VI Guidance, *supra* note 45 at 19 (emphasis added).

⁶⁹ VI Standard at Section 1.3.

⁷⁰ *Id.* at Section 3.2.34. (emphasis added).

a potentially unacceptable health risk exists. Third, the pVIC poses the possibility the owner faces tort and/or other potential legal liabilities and its potential liability may depend upon what actions it takes, from no action to extensive testing and analysis to mitigation and/or remediation of the vapor intrusion condition. Fourth, the pVIC likely needs to be disclosed by the owner of the property to prospective purchasers. This could cause a significant reduction in the value of the property or make the property unsaleable until the pVIC is determined not to exist.

All of these potential legal risks are posed by the pVIC presumption determination.

Unnecessary Investigation Expenses. As noted above, many of the Tier 1 presumed pVIC determinations are likely to be for conditions for which available data and agency guidance show a vapor intrusion assessment probably is not necessary because the condition is not expected to pose a threat or, in other cases, there is a low likelihood vapor intrusion has occurred that may pose a potentially unacceptable health risk for occupants of the target property. However, if a Tier 1 pVIC presumption is made, the VI Standard requires:

If the vapor intrusion assessment is a supplement to a Phase I ESA, “the source resulting in the pVIC, if not already identified as a REC in the Phase I, shall be identified as a REC and the pVIC discussed.”⁷¹

If the vapor intrusion assessment is independent of a Phase I ESA, the “environmental professional shall submit the VIA report to the user . . . with the conclusion that a pVIC exists and why. The user, working with the environmental professional, shall decide what further investigation is appropriate. One possible next step is to proceed to a Tier 2 evaluation. Another alternative is to proceed directly to pre-emptive mitigation (that is, Tier 4).”⁷²

Similarly, as noted above, Tier 2 presumed pVIC determinations are made when chemical concentration data are lacking. Again the environmental professional reports the pVIC in the vapor intrusion assessment report. Then, the VI Standard requires one of the following actions: the user may conduct further investigation, such as Tier 3 investigative work, directly proceed to preemptive mitigation (Tier 4), or decide not to proceed with the transaction.⁷³

For the Tier 2 pVIC presumption based on the lack of relevant existing data, it is necessary to conduct invasive testing, such as drilling and sampling an appropriate number of groundwater wells to meet the VI Standard Tier 2 data needs for determining a pVIC does not exist. Alternatively, under the VI Standard, preemptive mitigation could be undertaken, such as installing an active subslab vapor venting system, to eliminate the pVIC. In many of these situations, however, absent the pVIC presumptions, investigation and/or mitigation would not be necessary because a vapor intrusion condition that poses an unacceptable risk to building occupants would not likely exist.

More importantly, because the user who commissioned the VI Standard Tier 1 and/or Tier 2 investiga-

tion is likely the prospective buyer of the target property and not the owner or lessee, the user may have no interest in incurring additional investigative or mitigation costs. If the prospective buyer does not purchase the property, the VIA report is left behind signed by the environmental professional with its pVIC finding for the target property.

As a result, to eliminate or reduce the legal risks identified above or remove the stigma attached to the property as a result of the pVIC determination, the property owner/lessee may feel compelled to conduct investigations to seek to demonstrate no pVIC exists or to implement mitigation measures to eliminate the pVIC. If successful, these actions would enable the owner to assure itself and the property occupants no potentially unacceptable health risk exists. Thus, the property owner/lessee may do the following:

- conduct a Tier 2 assessment (i.e., obtain whatever existing environmental data exists and conduct invasive testing to collect any groundwater, soil, and/or soil gas data needed to perform the numeric plume and RBC tests) to demonstrate chemicals of concern are not present in groundwater, soil, or soil gas at levels that could result in indoor air concentrations that exceed the RBCs;

- if the Tier 2 investigative work does not eliminate the pVIC, conduct a more expensive Tier 3 evaluation to demonstrate a pVIC/VIC does not exist for the property/building; or

- undertake Tier 4 preemptive mitigation (such as installing engineering or institutional controls for existing buildings) to eliminate the pVIC.

These actions could be quite expensive and require considerable time to complete.

In sum, a pVIC presumption could result in users and/or property owners/lessees incurring significant groundwater, soil, and/or soil gas investigation and sampling costs or mitigation expenses that would not necessarily have been incurred absent the pVIC presumption and that could occur in situations where it is unlikely vapor intrusion would occur in a building that might present an unacceptable health risk to occupants.

Lost or Delayed Sales. As shown above, a pVIC presumption could result in the need to undertake further investigation and/or mitigation. Investigation would require: (1) development of the site investigation work plan; (2) depending upon local agency requirements, approval by the appropriate government agency(ies) to install monitoring wells; (3) mobilization and performance of the investigation; (4) analysis of the samples and reporting of the results by a qualified laboratory; (5) analysis and interpretation of the results by the environmental professional; and, possibly, (6) reporting the results to the appropriate government agency. Based on the investigation results, the agency might require further investigation. Mitigation similarly would require a number of implementation steps.

If the person conducting the initial VI Standard assessment is the prospective purchaser and further investigation is recommended by the environmental professional, if the seller allows the prospective purchaser to conduct the investigation, this would delay the transaction. Alternatively, the seller may not permit the prospective purchaser to conduct the investigation and the purchaser may decide to forgo purchasing the property. Similar results could flow from a mitigation effort.

⁷¹ *Id.* at Section 8.7.1 (emphasis added; emphasis identifying defined terms omitted).

⁷² *Id.* at Section 8.7.2 (emphasis added; emphasis identifying defined terms omitted).

⁷³ *Id.* at Section 9.6.

For a lender, if an investigation is deemed necessary by the prospective purchaser, the lender may decide not to provide the loan or advise that the loan must be renegotiated upon completion of the investigation. This could result in losing or delaying the sale.

Thus, a pVIC presumption results in a condition being determined for the property that could result in unnecessarily losing or delaying the sale of the property and/or losing or increasing the costs of a loan.

Presumptions Should Be Eliminated. Due to the significant flaws in the VI Standard discussed above, the VI Standard does not represent “good commercial and customary practice” for conducting vapor intrusion assessments of a property. They are inappropriate for an evaluation process that is supposed to be “practical and reasonable”⁷⁴ and for which “professional judgment is vital to the assessment process.”⁷⁵

As discussed above, the presumptions are not based on sound science or policy and are subject to significant flaws. The presumptions can result in unnecessary investigation expenses, legal liabilities, and transaction risks.

Just as the Phase I ESA does not have—or need—presumptions to determine if a REC exists, so the VI Standard should not establish presumptions to determine a pVIC exists.

In sum, the VI Standard presumptions should be eliminated in any revision of the VI Standard.⁷⁶

A Prudent Evaluation Approach Is Best for Vapor Intrusion Screening or Assessment

Because of the problems posed by the VI Standard pVIC presumptions, a prudent vapor intrusion screening or assessment approach that avoids facing the pVIC presumption risks is to retain environmental experts to conduct the vapor intrusion screening or assessment and have them rely on their vapor intrusion expertise and experience and make use of, as appropriate, federal, state and/or local agency vapor intrusion guidance. This approach is consistent with EPA’s “all appropriate inquiry” requirement under the Comprehensive Environmental Response, Compensation, and Liability Act⁷⁷

⁷⁴ *Id.* at Section 1.3.

⁷⁵ *Id.* at Section 4.3.

⁷⁶ The VI Standard pVIC presumptions are discussed in Section E above and are in VI Standard Sections 3.2.34, 8.5.3, 8.6, and 9.4.

⁷⁷ See 40 CFR 312.11 (“The following industry standards may be used to comply with the requirements set forth in Sections 312.23 through 312.31: (a) The procedures of ASTM International Standard E1527-05 entitled “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.” 40 CFR 312.1(b) provides that “The requirements of this part are applicable to: (1) Persons seeking to establish: (i) The innocent landowner defense pursuant to CERCLA sections 101(35) and 107(b)(3); (ii) The bona fide prospective purchaser liability protection pursuant to CERCLA sections 101(40) and 107(r); (iii) The contiguous property owner liability protection pursuant to CERCLA section 107(q); and (2) persons conducting site characterization and assess-

and with proper implementation of the Phase I ESA process.⁷⁸ Thus:

■ The VI Standard “does not alter or in any way define the scope of” the Phase I Standard.⁷⁹ The standard is not a required element of a Phase I investigation.

■ “[P]erformance of [the VI] standard is not a requirement of and does not constitute, expand, or in any way define ‘all appropriate inquiry’ as defined and approved by U.S. EPA under CERCLA and the regulations thereunder, including 40 CFR Sec. 312.11.”⁸⁰

■ The VI Standard “is intended for use on a voluntary basis by parties who wish to conduct a [vapor intrusion screening or assessment] on” a real estate parcel.⁸¹

■ An environmental professional who is retained to perform a vapor intrusion assessment or screening can undertake a vapor intrusion evaluation *without following the VI Standard*.

U.S. EPA and more than 25 states have issued guidance, policies, and/or regulatory requirements for conducting VI assessments. For states that have not promulgated VI assessment guidance, the EPA guidance can be used.

Therefore, when it is appropriate to conduct a vapor intrusion assessment or screening, a sound, scientifically valid assessment or screening can be performed that avoids the risks posed by the VI Standard pVIC presumptions, takes advantage of the existing body of agency vapor intrusion guidance, and is consistent with the EPA “all appropriate inquiries” criteria and the Phase I assessment process.

Conclusion

For the reasons discussed above, the VI Standard does not define “good commercial and industry practice.” The pVIC presumptions eliminate the appropriate role of professional judgment that the VI Standard states is “vital to the performance of [a VI Standard] assessment.” The unscientific and poor policy VI Standard presumptions can result in a potentially “unacceptable human health risk” determination pVIC without factual support. Thus, the VI Standard presumptions should be eliminated in any revision of the VI Standard.

Good commercial and industry practice for conducting vapor intrusion assessments of a property is better met by having a vapor intrusion assessment performed by expert environmental professionals who rely on their vapor intrusion expertise and experience and make use of, as appropriate, federal, state, and/or industry vapor intrusion guidance.

ment with the use of a grant awarded under CERCLA section 104(k)(2)(B).”

⁷⁸ See discussion above in Section F and in *Roe*, “New ASTM Standard for Assessment of Vapor Intrusion: More Harm Than Good,” *supra* note 37.

⁷⁹ VI Standard, Section 1.1 (emphasis added).

⁸⁰ *Id.* (emphasis added).

⁸¹ *Id.* at Section 4.1 (emphasis added).

