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ARTICLE

The ‘Volatile’ World of Vapor Intrusion: Understanding Vapor Intrusion Regulation and the Potential for Litigation

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I. INTRODUCTION

Vapor intrusion is breathing new life into decades-old controversies and regulatory actions. State environmental agencies in recent years have reopened *hundreds of sites* for vapor intrusion assessment that were previously subject to final closure.¹ Meanwhile, at least one court has permitted plaintiffs to pursue an action for alleged damage due to vapor intrusion even when an action arising from the same soil and groundwater contamination was settled more than *twenty-five years* prior.² Vapor intrusion has become a hot topic amongst legal practitioners, as well as a significant concern for the regulated community. The attention and concern arises largely from the uncertainty surrounding vapor intrusion—an uncertainty that

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1. See INTERSTATE TECH. & REGULATORY COUNCIL, ITRC STATE SURVEY: RE-VISITING “CLOSED” SITE FOR VAPOR INTRUSION CONCERNS (Oct. 2007), *available at* <http://www.itrcweb.org/vaporintrusionresources/ReOpeningCasesVISurveyOct07sh.pdf>.

2. See *Aiken v. Gen. Elec. Co.*, 869 N.Y.S.2d 263 (N.Y. App. Div. 2008).

pervades real estate transactions, contaminated site cleanups, toxic tort suits, and class action litigation. Clear regulatory guidance is lacking, and sites long thought to be “clean” may give rise to unexpected liabilities.

This article provides a conceptual overview of vapor intrusion, identifies available guidance for assessment of the vapor intrusion pathway, and examines the potential for government enforcement actions, citizen suits, and tort suits involving vapor intrusion.

II. DISCUSSION

A. Vapor Intrusion Defined and the Types of Chemicals at Issue

Vapor intrusion is the migration of subsurface chemicals into overlying structures. As the United States Environmental Protection Agency (EPA) has explained, volatile chemicals (i.e., those having a tendency to disperse in fumes or vapor) in contaminated soils or groundwater may emit vapors that migrate through the soil into indoor air spaces.³ Chemical vapors may, for example, migrate through cracks in building foundations or move through permeable materials. Upon reaching overlying buildings, volatilized chemicals may be inhaled by humans. Accordingly, “vapor intrusion” describes one of several pathways through which humans may be exposed to substances in subsurface soils or groundwater.

In comparison to more well-known pathways, such as dermal contact or ingestion, vapor intrusion presents a more complex risk assessment analysis.⁴ This is because “changing atmospheric conditions such as wind, pressure, and precipitation

3. EPA, OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, EPA530-D-02-004, DRAFT GUIDANCE FOR EVALUATING THE VAPOR INTRUSION TO INDOOR AIR PATHWAY FROM GROUNDWATER AND SOILS 4 (Nov. 2002), *available at* <http://www.epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf> [hereinafter EPA DRAFT GUIDANCE].

4. *See* WIS. DEP'T OF HEALTH & FAMILY SERVS. (DHFS), GUIDANCE FOR PROFESSIONALS, CHEMICAL VAPOR INTRUSION AND RESIDENTIAL INDOOR AIR 1 (2003), *available at* http://dhs.wisconsin.gov/eh/Air/pdf/VL_guide.pdf [hereinafter WISCONSIN GUIDANCE].

rapidly affect indoor [volatile organic compound] concentrations.”⁵ Adding to the complexity is the possibility that a given chemical may be present in a structure as a result of both vapor intrusion and an unrelated emission source, such as a household chemical or industrial source.⁶ Furthermore, most human-occupied structures are equipped with heating, ventilation, and cooling systems (HVAC), which greatly impact volatilized chemical concentrations.⁷ Privacy concerns add yet another layer of complexity, as evaluating a particular site’s risks from vapor intrusion may necessitate sub-slab and indoor air sampling—which can disrupt occupants of affected structures. Accordingly, though the concept of vapor intrusion is relatively simple, understanding the risks that it may pose to human health can prove challenging.

EPA’s Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (EPA Draft Guidance) provides a table of chemicals that may be found at hazardous waste sites, and notes whether those chemicals are “[1] sufficiently volatile . . . and [2] sufficiently toxic . . . to result in potentially unacceptable indoor inhalation risks.”⁸ If a subsurface chemical is neither “sufficiently volatile”⁹ nor “sufficiently toxic,” EPA recommends no further screening action for vapor intrusion.¹⁰ For example, according to EPA, benzene, trichloroethylene (TCE), and perchloroethylene (PERC) satisfy both criteria, while dichlorodiphenyltrichloroethane (DDT), beta-

5. *Id.*

6. EPA DRAFT GUIDANCE, *supra* note 3, at 5.

7. For instance, the operation of HVAC systems can create a negatively-pressured environment that draws soil vapors into structures. See N.Y. STATE DEP’T OF HEALTH, GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK 1 (Oct. 2006), *available at* http://www.health.state.ny.us/environmental/investigations/soil_gas/svi_guidance/docs/svi_main.pdf [hereinafter NEW YORK GUIDANCE].

8. EPA DRAFT GUIDANCE, *supra* note 3, at 15. The table, “Table 1,” is located at page 53.

9. EPA uses a Henry’s Law Constant greater than 10^{-5} atm m³/mol for the volatility threshold, and an incremental lifetime cancer risk greater than 1×10^{-6} (one in a million) for the toxicity threshold. *Id.* Henry’s Law is calculated by multiplying vapor pressure by molecular weight and dividing by water solubility.

10. *Id.*

hexachlorocyclohexane (beta-HCH), and butanol lack sufficient volatility to pose a vapor intrusion threat.¹¹

B. Vapor Intrusion Regulations

1. Federal Regulation

Although vapor intrusion is technically an air quality issue, EPA and state agencies tasked with investigating and remediating hazardous waste sites have primarily regulated vapor intrusion to date.¹² Accordingly, at the federal level, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) are the operative statutory schemes for regulating vapor intrusion. At least one jurisdiction has recommended that “[v]apor intrusion is now a standard consideration during investigations related to [RCRA] . . . and [CERCLA].”¹³ In addition, the Occupational Safety and Health Administration (OSHA) may increasingly play a prominent role in regulating vapor intrusion in the workplace.¹⁴ The following subsections consider these federal regulatory schemes in turn.

a. RCRA

RCRA creates a comprehensive regulatory system for managing hazardous wastes from “cradle to grave.” Enacted in 1976, RCRA’s primary purpose is to “minimize the *present and future* threat to human health and the environment” by ensuring that hazardous chemicals are safely managed.¹⁵ To this end, RCRA imposes regulatory requirements on “generators” and “transporters” of hazardous wastes and owners and operators of hazardous waste “treatment, storage, and disposal facilities.”¹⁶

11. *Id.* at 53-55.

12. Importantly, under the Clean Air Act (CAA), the EPA’s primary focus is on outdoor, not indoor, air quality.

13. See EPA Region 2 Superfund, *Vapor Intrusion*, EPA, <http://www.epa.gov/region02/superfund/npl/vaporintrusion/> (last updated Oct. 5, 2010).

14. See *infra* Part B.1.c.

15. *Meghrig v. KFC W., Inc.*, 516 U.S. 479, 486 (1996) (emphasis added).

16. 42 U.S.C. §§ 6922-6924 (2006).

RCRA's corrective action provision at United States Code Section 6973¹⁷ provides that once the EPA Administrator receives evidence that the handling, storage, treatment, transportation, or disposal of any solid waste or hazardous waste "may present an imminent and substantial endangerment to health or the environment," EPA may then bring a suit against any person who has contributed or is contributing to the endangerment.¹⁸ Recent court rulings demonstrate that a site contaminated with substances sufficiently volatile and toxic to present a vapor intrusion threat can fall within the purview of this provision.¹⁹ Importantly, citizens may also sue "any person" pursuant to Section 6972(a) when virtually any RCRA requirement has been violated or when the "imminent and substantial" endangerment threshold is met.²⁰

b. CERCLA

In contrast to RCRA, CERCLA (Superfund) is considered a backwards-looking statute—imposing sweeping liability for the remediation of contaminated properties.²¹ CERCLA's primary

17. Unless indicated otherwise, all future Section references are to the United States Code.

18. 42 U.S.C. § 6973 (2006); *see Meghrig*, 516 U.S. at 484-86 (interpreting RCRA's imminent and substantial endangerment requirement).

19. *See, e.g.*, *United States v. Apex Oil Co.*, No. 05-CV-242-DRH, 2008 WL 2945402, at *79 (S.D. Ill. July 28, 2008) ("Vapors emanating from hydrocarbon contamination in soils at the Hartford Site present or may present an imminent and substantial endangerment to health, because Hartford residents who are exposed [to] chemicals contained in those vapors may suffer adverse health effects").

20. 42 U.S.C. § 6972(a) (2006). *See, e.g.*, *Interfaith Cmty. Org. v. Honeywell Int'l, Inc.*, 399 F.3d 248, 258 (3d Cir. 2005) (holding that a community organization and five individuals had standing to sue under RCRA's citizen suit provision); *see also* *Grace Christian Fellowship v. KJG Invs., Inc.*, No. 07-C-0348, 2008 U.S. Dist. LEXIS 45981 (E.D. Wis. June 12, 2008) (arising in part under RCRA's citizen suit provision and involving allegations of exposure to petroleum hydrocarbon vapors).

21. *See* *United States v. Shell*, 605 F. Supp. 1064, 1071-72 (Colo. 1985) ("[P]re-CERCLA law . . . could not effectively abate the ongoing environmental deterioration resulting from wastes which had been dumped *in the past*. CERCLA was enacted to address these problems. It is by its very nature backward looking.") (emphasis added); *see also Meghrig*, 516 U.S. at 483 (comparing RCRA and CERCLA). Specifically, CERCLA establishes requirements for closed or abandoned hazardous waste sites, liability for

aims are the “prompt cleanup of hazardous waste sites and [the] imposition of all cleanup costs on the responsible party.”²² Any current or past owner or operator of a facility, as defined under CERCLA, can be considered a responsible party.

CERCLA’s triggering provision is similar to that in RCRA. Whenever there is “a release or substantial threat of release . . . of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare,” the EPA administrator has the authority to take “any . . . response measure consistent with the national contingency plan” that he or she deems necessary to “protect the public health or welfare or the environment.”²³ Thus, EPA has broad authority under this provision to order removal or remediation of subsurface contamination where vapor intrusion poses an imminent and substantial threat.²⁴ Like RCRA, CERCLA contains a “citizen suit” provision. Pursuant to Section 9659, citizens may sue private entities and the federal government for violations of any standard, regulation, or requirement under CERCLA.²⁵

Notably, CERCLA contains a delayed discovery rule that may feature prominently in vapor intrusion litigation.²⁶ The rule provides that the statute of limitations for claims relating to CERCLA sites begins at “the date the plaintiff knew (or reasonably should have known) that the personal injury or property damages . . . were caused or contributed to by the hazardous substance or pollutant or contaminant concerned.”²⁷ Importantly, CERCLA’s delayed discovery rule preempts state law where the applicable state limitations period provides a start date which is earlier than the federally required commencement

persons responsible for such sites, and a trust fund (i.e., the Superfund) to pay for cleanup when no responsible parties can be identified. *See* 42 U.S.C. §§ 9601, 9607, 9621, 9611 (2006).

22. *Meghrig*, 516 U.S. at 483.

23. 42 U.S.C. § 9604(a)(1)(B) (2006).

24. *See, e.g.*, *Action Mfg. Co. v. Simon Wrecking Co.*, 428 F. Supp. 2d 288, 332 (E.D. Pa. 2006) (discussing the implications of a vapor intrusion threat on cleanup costs under CERCLA).

25. 42 U.S.C. § 9659(a) (2006). Citizens also may sue any officer of the United States when there is a failure to perform a non-discretionary duty under CERCLA. *Id.*

26. 42 U.S.C. § 9658(b)(4)(A) (2006).

27. *Id.*

date—thereby extending its protection to hybrid state and federal law claims.²⁸ Accordingly, potentially responsible parties should be wary of sites which have obtained closure or “no further action” letters in the absence of a vapor intrusion investigation, as plaintiffs may attempt to pursue otherwise time-barred vapor intrusion claims under the protection of CERCLA’s delayed discovery rule.

Recently, EPA proposed adding vapor intrusion to the criteria used to determine whether a contaminated site belongs on the National Priorities List (NPL). The Hazard Ranking System (HRS) is the screening tool used to determine whether a site qualifies for the Superfund program. The proposed revision stems in part from a May 2010 report wherein the Government Accountability Office determined that sites with unacceptable vapor intrusion risks may escape designation on the NPL if the HRS is not modified.²⁹ The HRS “does not currently recognize [vapor intrusion] risks; therefore, unless a site with vapor intrusion is listed on some other basis—such as groundwater contamination, EPA cannot clean up the site using remedial program funding.”³⁰ Thus, adding a new criterion may result in more site listings and cleanup approaches that prioritize vapor intrusion prevention and mitigation.

c. Non-Residential Settings and The Occupational Safety and Health Act (OSHA)

As a final consideration, the issue of whether EPA will defer to OSHA’s standards for vapor exposure in non-residential settings has received considerable attention.³¹ In the EPA Draft Guidance, EPA states that “OSHA . . . will take the lead role in addressing occupational exposures.”³² This position has received

28. 42 U.S.C. § 9658(a)(1) (2006).

29. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-10-380, EPA’S ESTIMATED COSTS TO REMEDIATE EXISTING SITES EXCEED CURRENT FUNDING LEVELS, AND MORE SITES ARE EXPECTED TO BE ADDED TO THE NATIONAL PRIORITIES LIST 31 (May 2010), available at <http://www.gao.gov/new.items/d10380.pdf>.

30. *Id.*

31. See Matthew Valentine, *Regulating Soil Vapor Intrusion in New York State*, 16 ALB. L.J. SCI. & TECH. 457, 472-73 (2006) (discussing OSHA standards).

32. See EPA DRAFT GUIDANCE, *supra* note 3, at 3.

criticism from those arguing that OSHA's permitted exposure levels are not protective enough of human health.³³ Moreover, whether OSHA's standards will preempt states from setting more protective workplace standards has yet to be determined. The State of New York's tenant notification law, for example, currently requires notification when test results exceed New York State Department of Health (NY Dept. of Health) *or* OSHA standards.³⁴

Given the often conflicting OSHA and EPA standards for exposure to certain chemicals, the outcome of this regulatory conundrum will have critical implications for the regulatory community.³⁵ In 2009, EPA indicated that a policy for vapor intrusion in non-residential settings may be forthcoming in the spring of 2010.³⁶ To date, it does not appear that EPA has established such a policy.³⁷

Recently, a federal district court in Wisconsin considered which standards to apply in determining whether vapor intrusion in a non-residential setting posed an imminent threat to human

33. See Laurence S. Kirsch & Carrie F. Jenks, *Regulating Vapor Intrusion: What Standards Should Apply?*, DAILY ENV'T REP., 52 DEN B-1, 4 (2007) (concluding that OSHA is the appropriate authority for regulating vapor intrusion in an occupational setting, but noting that the disparity between OSHA and EPA protective standards has "made some observers hostile to the concept of OSHA regulation of vapor intrusion in the workplace").

34. See N.Y. ENVTL. CONSERV. LAW § 27-2405(2) (McKinney 2008).

35. See Kirsch & Jenks, *supra* note 33, at 3.

36. See Helen Dawson, *Vapor Intrusion: EP HQ: Update & Status*, FED. REMEDIATION TECHS. ROUNDTABLE (Nov. 10, 2009), <http://www.frtr.gov/pdf/meetings/nov09/presentations/dawson-presentation.pdf>.

37. Notably, at least one EPA Region, Region 6, has established a "Vapor Intrusion Policy" with regard to non-residential settings:

Appropriate steps should be taken to investigate vapor intrusion exposures and to reduce risks to acceptable levels in non-residential settings where workplace-related vapors are not expected (because hazardous-vapor forming chemicals are not being used as a part of routine operations). In industrial non-residential settings where similarly hazardous vapor-forming chemicals are being used as part of routine operations, review of vapor intrusion is generally not a priority while these conditions remain in place, unless conditions change, as in closure.

See EPA REGION 6 RCRA CORRECTIVE ACTION PROGRAM, VAPOR INTRUSION POLICY 2 (Oct. 2010), *available at* http://www.epa.gov/region6/6pd/rcra_c/ca/vapor_intrusion_policy.pdf (making no determination as to whether EPA's or OSHA's levels are "acceptable").

health under RCRA.³⁸ The court noted that, although useful, OSHA permissive exposure levels (PELs) were not the only relevant standard.³⁹ Nevertheless, the court rejected the plaintiff's contention that EPA and Wisconsin exposure levels should be relied upon; in the court's view, "[such] screening levels are developed solely for the purpose of setting a level at which further investigation is required; they are not a determination of actual danger."⁴⁰ Finally, the court reasoned that the National Institute for Occupational Safety and Health's recommendations were also pertinent, observing that "[l]acking the force of law does not mean such recommendations lack the force of science as pertains to what constitutes a risk to health or the environment."⁴¹

2. State Regulation

In addition to federal regulation, states also have the ability to regulate vapor intrusion. Under RCRA, for example, the federal government "directs" the states to create implementation plans which effectively transfer the primary responsibility for implementing and enforcing this statute to the states.⁴² Thus, with regard to RCRA, states regulate vapor intrusion in much the same manner as described previously—though states are free to impose more stringent requirements.

Although delegation to the states is not provided for under CERCLA in the same manner, there are numerous state programs that parallel—but are legally distinct from—CERCLA. Moreover, the federal courts have held that CERCLA only preempts such laws in a few circumstances, which could

38. See *Tilot Oil, L.L.C. v. BP Prods. N. Am., Inc.*, 09-CV-210-JPS, 2012 U.S. Dist. LEXIS 5365, at *22-25 (E.D. Wisc. Jan. 17, 2012).

39. *Id.* at *23.

40. *Id.* at *23-24 (rejecting the plaintiff's contention that OSHA PELs should be rejected because the chemical (benzene) present was the result of "outside forces," rather than a product of the work environment. *Id.* at *23 n.13).

41. *Id.* at *24-25.

42. Although the Tenth Amendment bars the federal government from directing states to enact legislation, the federal government may condition state funding on the implementation of satisfactory environmental laws—effectively circumnavigating the Tenth Amendment. See, e.g., *New York v. United States*, 505 U.S. 144 (1992).

potentially result in both state and federal liability in vapor intrusion scenarios.⁴³ In practice, however, such regulatory efforts typically are coordinated.

In addition to traditional regulatory approaches, some states have enacted vapor intrusion-specific legislation. For example, in 2008, the New York Legislature enacted legislation entitled “Tenant Notification of Indoor Air Contamination,” which requires landlords to disclose the results of environmental testing to tenants and prospective tenants.⁴⁴ The legislation requires disclosure of indoor air sampling, as well as ambient air, sub-slab air, soil, and groundwater sampling.⁴⁵ The goal of this legislation is to provide tenants with information on the potential health risks of vapor intrusion.⁴⁶ The legislation applies to property owners or their agents who have received test results exceeding NY Dept. of Health or OSHA thresholds from an “issuer”—which includes persons subject to orders, participants in Brownfield agreements, the State Department of Environmental Conservation, or municipalities subject to contracts under the State’s Environmental Restoration Program.⁴⁷

California has also taken legislative action, enacting Assembly Bill 422 in 2007. The bill requires that any assessment of health or ecological risk prepared pursuant to the California Superfund Act include reasonable maximum estimates of VOCs

43. *See, e.g.,* Manor Care, Inc. v. Yaskin, 950 F.2d 122, 125 (3d Cir. 1991) (holding that directives issued by the New Jersey Department of Environmental Protection under New Jersey’s Spill Act were not preempted by CERCLA, and remarking that “CERCLA § 114(a), 42 U.S.C. § 9614(a), unambiguously states: ‘Nothing in this chapter shall be construed or interpreted as preempting any State from imposing any additional liability or requirements with respect to the release of hazardous substances within such State’”); *see also* Fireman’s Fund Ins. Co. v. Lodi, 302 F.3d 928, 941-57 (9th Cir. 2002) (holding that CERCLA did not preempt the field of hazardous waste remediation, since it permits states and their political subdivisions to enact hazardous waste regulations; the court found that “the balance of [a local ordinance]—including its provisions regarding natural resource damages, provisions that allow abatement procedures less stringent than the NCP, and provisions that concern information-gathering—remain viable and are not preempted”).

44. *See* N.Y. ENVTL. CONSERV. LAW § 27-2405 (McKinney 2008).

45. *Id.*

46. N.Y. Spons. Memo., Assemb., 231st Leg., 2008 A.B. 10952B (2008).

47. *See* N.Y. ENVTL. CONSERV. LAW § 27-2405 (McKinney 2008).

that may enter overlying structures.⁴⁸ Thus, regulatory attention on vapor intrusion is increasing.

C. Assessing the Site-Specific Risks of Vapor Intrusion

Within the last decade, federal and state agencies, as well as private sectors, have released a number of guidance documents focused on assessing the vapor intrusion pathway at hazardous waste sites.

1. The EPA Draft Guidance

In 2002, EPA published the EPA Draft Guidance, which aimed to assist EPA personnel, states, and the regulated community at large in assessing (1) whether subsurface vapors are intruding into indoor spaces, and (2) whether such vapors are present at levels that may pose an “unacceptable exposure risk.”⁴⁹ The non-binding document suggests three tiers of screening to determine whether “unacceptable risks” are present. The document is intended primarily to “ensure [the] protection of the public in residential settings but may be adjusted for other land uses.”⁵⁰ During a 2008 presentation, EPA identified several limitations in the EPA Draft Guidance—as well as advancements in vapor intrusion evaluation.⁵¹ The EPA website also contains a summary of the latest vapor intrusion sampling and mathematical modeling research.⁵²

Notably, EPA has come under fire for its failure to update the 2002 EPA Draft Guidance. In a report recently released by the EPA Office of the Inspector General (OIG), the OIG concluded that the EPA Draft Guidance has limited purpose and scope, and

48. See CAL. HEALTH & SAFETY CODE § 25356.1.5 (West 2008); CAL. WATER CODE § 13304.2 (West 2008).

49. EPA DRAFT GUIDANCE, *supra* note 3, at 6.

50. *Id.* at 2.

51. HELEN DAWSON, EPA, EPA UPDATE ON VAPOR INTRUSION (Sept. 2008), available at <http://www.newmoa.org/cleanup/cwm/vapor2008/materials/DawsonEPAVIUpdate9-08.pdf>.

52. “Modeling” refers to efforts to create algorithms approximating the vapor intrusion pathway. *Vapor Intrusion*, EPA, <http://www.epa.gov/oswer/vaporintrusion/> (last updated Apr. 30, 2012).

fails to account for evolving risk assessment science.⁵³ The OIG noted that the EPA Draft Guidance fails to provide vapor intrusion mitigation guidance.⁵⁴ The OIG also observed that the guidance did not address vapor intrusion at petroleum sites, and fails to recommend the “multiple lines of evidence” approach in assessing and evaluating vapor intrusion risks.⁵⁵ Finally, and perhaps most prominently, the OIG observed that EPA toxicity values are quite dated, including values for TCE and PERC.⁵⁶

In response to this and other criticisms, EPA has pledged to release a final revised guidance document by fall 2012.⁵⁷ The comment period on the 2002 Draft Guidance ended in May 2011; EPA plans to accept comments on the *revised* guidance document in spring of 2012.⁵⁸

2. The Interstate Technology & Regulatory Council

The Interstate Technology & Regulatory Council (ITRC) published a guidance document for assessing the vapor intrusion pathway in 2007 styled “A Practical Guideline” (ITRC Guidance).⁵⁹ ITRC is a self-described “state-led, national coalition” of personnel from state and federal regulatory agencies, tribes, and public and industry stakeholders.⁶⁰ Its guidance is intended to be used concurrently with applicable state or federal vapor intrusion guidance.⁶¹

ITRC prescribes a 13-step process for investigating the vapor intrusion pathway and determining whether mitigation measures

53. OFFICE OF INSPECTOR GEN., EPA, 10-P-0042, LACK OF FINAL GUIDANCE ON VAPOR INTRUSION IMPEDES EFFORTS TO ADDRESS INDOOR AIR RISKS, AT A GLANCE (Dec. 14, 2009), *available at* <http://www.epa.gov/oig/reports/2010/20091214-10-P-0042.pdf> [hereinafter OIG REPORT].

54. *Id.* at 5.

55. *Id.*

56. *Id.* at 6-7.

57. *Id.* at 12-13 (the “OSWER Response to OIG Draft Report,” an October 29, 2009 memorandum, is included in the OIG Report as Appendix B).

58. *See Vapor Intrusion*, *supra* note 52.

59. INTERSTATE TECH. & REGULATORY COUNCIL, VAPOR INTRUSION PATHWAY: A PRACTICAL GUIDELINE (Jan. 2007), *available at* <http://www.itreweb.org/Documents/VI-1.pdf>.

60. *Id.*

61. *Id.*

are needed.⁶² The ITRC process relies on a “lines of evidence” approach.⁶³ Notably, EPA was involved heavily in the development of the ITRC guidance. Indeed, the OIG reports that the ITRC guidance contains many of the updates EPA *would have* included in a final guidance document.⁶⁴ Yet, the ITRC does not supersede the EPA Draft Guidance. Thus, the ITRC Guidance—coupled with the OIG’s Report—may serve as a “road-map” for remedying some of the deficiencies in the 2002 EPA Draft Guidance.

3. American Society for Testing and Materials

Relatedly, the American Society for Testing and Materials International (ASTM) published a standardized guide for the assessment of vapor intrusion in real estate transactions (“ASTM Guide”).⁶⁵ The ASTM Guide is intended to supplement the Phase I environmental site assessment process, and provide a consistent approach for assessing vapor intrusion pathways across jurisdictions.⁶⁶

Prospective property purchasers have used *prior* ASTM standards for conducting “Phase I” environmental site assessments to qualify for liability protection under CERCLA.⁶⁷ This practice became common when EPA announced in 2005 that assessments conducted in accordance with ASTM’s prior standards (E 1527-05) would be satisfactory.⁶⁸ It remains unclear whether EPA will adopt the standards set forth in the ASTM Guide.⁶⁹

62. *Id.* at iii.

63. *Id.*

64. See OIG REPORT, *supra* note 53, at 8.

65. AM. SOC’Y FOR TESTING & MATERIALS, ASTM E2600-08 STANDARD PRACTICE FOR ASSESSMENT OF VAPOR INTRUSION INTO STRUCTURES ON PROPERTY INVOLVED IN REAL ESTATE TRANSACTIONS (2008), *available at* <http://www.astm.org/DATA.BASE.CART/HISTORICAL/E2600-08.htm> (last visited Sept. 29, 2012).

66. *Id.*

67. See Rebecca Almon, Luke Esch & Lukas Staks, *The “Rise” of Vapor Intrusion: Benefits and Risks of the 2008 ASTM Standards*, 37 COLO. LAW. 93, 96 (2008).

68. *Id.* at 94.

69. *Id.* at 95.

4. State Guidance

In addition to federal and private sector guidance, more than thirty states now have published specific vapor intrusion guidance documents or other recommendations for addressing vapor intrusion.⁷⁰ Eight other states appear to rely on guidance from EPA, ASTM, and/or ITRC.⁷¹ New York and California are illustrative as two states that have taken proactive approaches to vapor intrusion regulation.

The NY Dept. of Health issued a Guidance for Evaluating Soil Vapor Intrusion in the State of New York (New York Guidance). Its stated intent is to set forth a “reasonable and practical approach to identifying and addressing current and potential human exposures to contaminated subsurface vapors associated with known or suspected volatile chemical contamination.”⁷² The New York Guidance provides recommendations on sampling, data analysis, mitigation, and community outreach for interested parties. Like the EPA Draft Guidance, the New York Guidance is not a regulation, rule, or requirement.

In California, the Department of Toxic Substances (Cal. DTSC) and the California Environmental Protection Agency (CalEPA) recently revised its Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air

70. See, e.g., N.J. DEP'T OF ENVTL. PROT., VAPOR INTRUSION TECHNICAL GUIDANCE (Jan. 2012), *available at* http://www.state.nj.us/dep//srp/guidance/vaporintrusion/vig_main.pdf; WASH. DEP'T OF ECOLOGY, DRAFT GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN WASHINGTON STATE: INVESTIGATION AND REMEDIAL ACTION (Oct. 2009), *available at* http://www.ecy.wa.gov/programs/tcp/policies/VaporIntrusion/VI_guid_rev5_final_10-9-09.pdf; ALASKA DEP'T OF ENVTL. CONSERVATION, DIVISION OF SPILL PREVENTION & RESPONSE, DRAFT VAPOR INTRUSION GUIDANCE FOR CONTAMINATED SITES (July 2009), *available at* <http://dec.alaska.gov/spar/csp/guidance/draft-vi-guidance.pdf>; IND. DEP'T OF ENVTL. MGMT., DRAFT VAPOR INTRUSION PILOT PROGRAM GUIDANCE (Apr. 26, 2006), *available at* <http://www.in.gov/idem/files/la-073-gg.pdf>; COLO. DEP'T OF PUB. HEALTH AND ENV'T, HAZARDOUS MATERIALS & WASTE MGMT. DIV., DRAFT INDOOR AIR GUIDANCE (Sept. 2004), *available at* <http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251615961696> (document found under “Cleanup / Remediation”).

71. PARSONS, VAPOR INTRUSION / INDOOR AIR GUIDANCE SURVEY 5 (July 2010), *available at* <http://indoorairproject.files.wordpress.com/2010/07/final-massdep-vi-report-072710.pdf>.

72. NEW YORK GUIDANCE, *supra* note 7, at i.

(California Guidance).⁷³ The California Guidance is intended for use by, among others, regulators, responsible parties, developers, community groups, and consultants, and recommends a step-wise approach for evaluating the vapor intrusion exposure pathway at sites where volatile chemicals are present in the subsurface.⁷⁴

The California Guidance is the centerpiece in a multi-phase approach recommended by Cal. DTSC for evaluating and mitigating vapor intrusion.⁷⁵ Cal. DTSC has published, or expects to publish, separate advisory guidance for the following: active soil-gas investigations, vapor intrusion mitigation, public participation coordination, and the remediation of chlorinated VOCs in vadose zone soil.⁷⁶ Further, the documents comprising Cal. DTSC's multi-phase vapor intrusion approach supplement more general, pre-existing guidance for assessing exposure pathways—including Cal. DTSC's Preliminary Endangerment Assessment Guidance Manual and EPA's Risk Assessment Guidance for Superfund.⁷⁷

In summary, there is a considerable amount of guidance available to regulators and the regulated community with respect to evaluating vapor intrusion pathways. However, the bulk of this guidance is non-binding, and the myriad of available documents may generate more confusion than clarity. In fact, even the U.S. Postal Service has its *own* vapor intrusion guidance.⁷⁸ Regardless, vapor intrusion is receiving increasing regulatory scrutiny. As a consequence, the regulated community

73. CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, FINAL GUIDANCE FOR THE EVALUATION AND MITIGATION OF SUBSURFACE VAPOR INTRUSION TO INDOOR AIR (October 2011), *available at* http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf [hereinafter CALIFORNIA GUIDANCE].

74. *Id.* For a detailed discussion of the CALIFORNIA GUIDANCE, see B. Howard & J. Everett, *Sniffing Out Vapor Intrusion*, LAW360, Feb. 9, 2012, <http://www.law360.com/articles/304601/sniffing-out-vapor-intrusion>.

75. *See* CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, *Cal/EPA Resources for Identifying and Mitigating Risk Associated with Vapor Intrusion into Indoor Air*, http://www.dtsc.ca.gov/SiteCleanup/upload/VI_Flow_Chart.pdf (last visited Sept. 29, 2012).

76. *Id.*

77. CALIFORNIA GUIDANCE, *supra* note 73, at 2.

78. UNITED STATES POSTAL SERVICE, UNITED STATES POSTAL SERVICE (USPS) VAPOR INTRUSION GUIDANCE (Sept. 2009), *available at* <http://www.optexcorp.com/uspsess/Documents/Vapor%20Intrusion%20Doc.pdf>.

must pay special heed to this exposure pathway when transacting business involving contaminated properties.

D. Regulatory Actions and Citizen Suits

Though only limited precedent is available, it appears that vapor intrusion-related enforcement actions and citizen suits are on the rise. This trend can be expected to continue, since vapor intrusion is a standard consideration in RCRA and CERCLA-related investigations.⁷⁹ Moreover, and critically, various jurisdictions have recently been taking a broad view of RCRA's imminent and substantial endangerment requirement, thereby increasing the attention on intrusion sites and assessments.

1. Vapor Intrusion Lawsuits Pursuant to RCRA

United States v. Apex Oil: The earliest, and perhaps most prominent, federal opinion in vapor intrusion litigation is an unpublished decision from the Southern District of Illinois, *United States v. Apex Oil*.⁸⁰ In *Apex*, the United States sought injunctive relief requiring Apex Oil to “abate the existing and potential threats to human health and the environment posed by an accumulation of subsurface petroleum hydrocarbons” under Section 9673 of RCRA.⁸¹ Though unpublished, the decision may be viewed as a test of RCRA's applicability to vapor intrusion.

Apex Oil and other parties were alleged to be responsible for the contamination of soil and groundwater in Hartford, Illinois through the operation of an oil refinery.⁸² The EPA assumed primary responsibility of the Hartford site in 2003 and issued a “Threat Memorandum” in 2004 documenting the finding of an imminent and substantial endangerment under RCRA. This ultimately led to a civil action.⁸³ The court's fact-finding is replete with evidence of high indoor concentrations of petroleum-based VOCs, correspondingly high measurements of petroleum-

79. See EPA Region 2, *supra* note 13.

80. See *United States v. Apex Oil Co.*, No. 05-CV-242-DRH, 2008 WL 2945402 (S.D. Ill. July 28, 2008).

81. *Id.* at *1.

82. *Id.* at *1-2.

83. *Id.* at *40-41.

based VOCs in the soil, and a history of vapor intrusion-related citizen complaints (centering on both odors and claimed health effects).⁸⁴ Furthermore, the court found facts generally relating to the mechanics of vapor intrusion, the specific volatilization and migration of the chemicals present at the Hartford site, and the health risks associated with the inhalation of petroleum hydrocarbon vapors.⁸⁵ Ultimately, the court held that the subsurface contamination at the site “presents or may present” an imminent and substantial risk due to adverse health effects from inhalation, the potential for fire and explosions, and groundwater contamination.⁸⁶ The court found Apex Oil jointly and severally liable as a contributor to the handling, storage, treatment, transportation, and disposal of waste at the site.⁸⁷

It should be noted, however, that the indoor vapor concentrations in *Apex* were extraordinary (relative to risk-based thresholds set by regulatory agencies). Concentrations of several petroleum hydrocarbons, including benzene, were far in excess of the ASTDR’s minimum risk levels (MRLs).⁸⁸ In some instances, contaminant concentrations in groundwater were “several orders of magnitude above pertinent regulatory thresholds such as Maximum Containment Levels.”⁸⁹ Moreover, the court noted that more than a dozen fires and explosions had been caused by the extreme build-up of hydrocarbon vapors.⁹⁰ Accordingly, the court’s potential imminent and substantial endangerment finding was relatively straight-forward. This is not to say, however, that such egregious facts are necessary for a finding of imminent and substantial endangerment. Indeed, the court opined that “the government’s burden of proving endangerment is low—certainty and exactitude are not required[.]”⁹¹

Grace Christian Fellowship v. KJG Investments Inc.: A federal court in Wisconsin considered whether RCRA’s imminent

84. *Id.* at *7-72.

85. *Id.* at *6-72.

86. *Id.* at *79-80.

87. *Id.* at *81-83.

88. *Id.* at *27-31.

89. *Id.* at *66.

90. *Id.* at *31-34.

91. *Id.* at *79 (citing S. REP. NO. 98-284, at 59 (1983) (discussing the legislature’s intent in enacting RCRA § 7003)).

and substantial endangerment requirement was met under less egregious circumstances than those in *Apex*.⁹² In *Grace Christian*, a church congregation sued an adjacent gas station alleging that historic gasoline spills had migrated underneath the church, thereby allegedly threatening the health of pupils, teachers, and parents who used the church's basement school.⁹³ One spill had contaminated the site in 2006, requiring an emergency regulatory response and temporary closure of the building.⁹⁴ The defendant, however, contended that there was no evidence of any *present* danger to the church patrons' health and safety.⁹⁵

Reviewing the evidence, the court noted that although plaintiff's experts found petroleum constituents in sub-slab vapor samples in excess of Wisconsin Department of Natural Resources standards, the Wisconsin Department of Health and Family Services "did not find an indoor air problem of health concern" in indoor sampling.⁹⁶ While plaintiff's expert testified that the cement slab provided a pathway for sub-slab vapors to migrate into the church's basement, the court found that testimony unpersuasive—citing a comparison of indoor air contaminants and sub-slab contaminants performed by one of the defendant's experts which demonstrated that indoor air contaminants did not match those underneath the church.⁹⁷ Because the plaintiff failed to demonstrate the existence of a complete vapor intrusion pathway, the court held that the imminent and substantial endangerment threshold was not met.⁹⁸ As subsequent decisions

92. See *Grace Christian Fellowship v. KJG Invs. Inc.*, No. 07-C-0348, 2009 U.S. Dist. LEXIS 76954 (E.D. Wis. Aug. 7, 2009) (In an earlier decision in the same dispute, the court mentioned vapor intrusion in the context of considering whether to admit rebuttal evidence. See *Grace Christian Fellowship v. KJG Invs., Inc.*, No. 07-C-0348, 2008 U.S. Dist. LEXIS 45981, *15-16 (E.D. Wis. June 12, 2008) (holding that expert evidence relating to an alleged instance of vapor intrusion was "new evidence" and would not be admitted)).

93. *Grace Christian Fellowship*, 2009 U.S. Dist. LEXIS 76954, at *8-9.

94. *Id.* at *6-7.

95. *Id.* at *9-10.

96. *Id.* at *24-26.

97. *Id.* at *26-29.

98. *Id.* at *33-34. Moreover, the court appears to have largely ignored the "environment" portion of the statutory language—never considering whether the

demonstrate, the court's approach in *Grace* has become the conservative end of the imminent and substantial endangerment spectrum.

Newark Group v. Dopaco, Inc.: A California federal court in 2010 similarly held that the plaintiff was required to show more than just that toluene contamination existed on real property to meet the imminent and substantial endangerment threshold.⁹⁹ The plaintiff in *Newark* demonstrated that two separate environmental consultants found levels of toluene “*thousands of times higher* than action standards established by the EPA and California EPA,” and argued that this contamination was sufficient to meet RCRA's imminent and substantial endangerment threshold.¹⁰⁰ The plaintiff also provided evidence about toluene's effects on humans, fish, invertebrates, and various microorganisms.¹⁰¹ Moreover, the Regional Water Board indicated that the groundwater was a potential source of municipal or domestic water.¹⁰² The court held that the plaintiff had not met its burden and cited a defense expert's testimony for the proposition that the plaintiff had “not evaluated whether there [wa]s a population at risk and . . . not evaluated potential exposure pathways.”¹⁰³ The court found that the plaintiffs had not shown that the groundwater was actually being used for drinking purposes.¹⁰⁴

Voggenthaler v. Maryland Square: In 2010, a Nevada district court employed an approach inapposite to that in *Grace* and *Newark*, emphasizing that RCRA's imminent and substantial endangerment threshold is met when contamination *may* pose a threat to human health.¹⁰⁵ In *Voggenthaler*, Nevada Department of Environmental Protection (NDEP) testing demonstrated that

sub-slab contamination constituted an imminent and substantial threat to the “environment,” rather than “human health.” 42 U.S.C. § 6973 (1984).

99. *Newark Grp. v. Dopaco, Inc.*, No. 2:08-CV-02623-GEB-DAD, 2010 U.S. Dist. LEXIS 40150, at *19 (E.D. Cal. Apr. 1, 2010).

100. *Id.* at *14-15 (emphasis added).

101. *Id.* at *16.

102. *Id.* at *15.

103. *Id.* at *16-17.

104. *Id.* at *17-19.

105. *Voggenthaler v. Md. Square, L.L.C.*, No. 2:08-CV-1618-RCJ-GWF, 2010 U.S. Dist. LEXIS 74217 (D. Nev. July 22, 2010).

PERC contamination in the soil and groundwater migrated from beneath a drycleaner to a nearby residential area, thereby creating the potential for vapor intrusion.¹⁰⁶ The affected residential homeowners filed a RCRA citizen suit against the responsible parties, seeking a judgment requiring the defendants to address and abate the contamination “as may be necessary.”¹⁰⁷ The PERC levels in the groundwater exceeded EPA’s MCL. Plaintiffs’ experts contended that soil-gas PERC concentrations were present at levels that posed a threat to human health and that vapors continually were migrating into overlying residences.¹⁰⁸ Defendants’ experts, by contrast, contended that PERC levels were generally low at the site, and that there was no evidence that the shallow groundwater contamination would impact human health or the environment.¹⁰⁹

The court held that contamination at the site posed an imminent and substantial endangerment to the environment, reasoning that the term environment “presumably encompass[ed] air, soil and water, including groundwater.”¹¹⁰ Accordingly, the court held that contamination of groundwater in excess of the applicable MCL, *by definition*, constituted an imminent and substantial danger.¹¹¹ With respect to human health, the court rejected the defendants’ contention that there must be a “reasonable cause for concern that someone or something may be exposed to a risk of harm if remedial action is not taken.”¹¹² Rather, the court read the statute “expansive[ly]” and found that the contamination “pose[d], or ‘may’ pose,” an imminent and substantial threat to human health.¹¹³ Thus, the Nevada court’s approach differed greatly from that in *Grace* and *Newark*, which

106. *Id.* at *17-18. NDEP initiated administrative proceedings against several responsible parties, as well as a formal cost recovery action in District Court. Though the court did not consider the impact of these administrative proceedings on its ability to fashion relief, subsequent courts have differed on whether such proceedings eliminate the need for concurrent citizen suits. *Id.* at *19-20.

107. *Id.* at *20.

108. *Id.* at *38-39.

109. *Id.* at *40.

110. *Id.* at *41.

111. *Id.* at *41-42.

112. *Id.* at *42.

113. *Id.* at *43-44.

required plaintiffs to conclusively demonstrate a complete exposure pathway.

Sullins v. ExxonMobil Corp.: The *Sullins* court also took a broad view of RCRA's imminent and substantial endangerment requirement.¹¹⁴ Reviewing the Ninth Circuit's interpretation of this threshold, the *Sullins* court noted:

A finding of 'imminency' does not require a showing that actual harm will occur immediately so long as the risk of threatened harm is present. 'An imminent hazard may be declared at any point in a chain of events which may ultimately result in harm to the public.' Imminence refers 'to the nature of the threat rather than identification of the time when the endangerment initially arose.' Moreover, a finding that an activity may present an imminent and substantial harm does not require actual harm. Courts have also consistently held that endangerment means a threatened or potential harm *and does not require proof of actual harm*.¹¹⁵

Reviewing the evidence, the court noted plaintiffs' consultants' admissions that (1) the contamination was not impacting any known water supply well; (2) the contaminant plume was stable; and (3) if left undisturbed, the contamination would "not adversely impact human health or the environment."¹¹⁶ However, groundwater contamination was present in concentrations such that "if the property were developed and the groundwater were to be used, remediation of the groundwater would be necessary."¹¹⁷ Importantly, the court noted that the site was within the City of Livermore's redevelopment zone—targeted for development in the City's specific plan.¹¹⁸ Though the court conceded that deed restrictions precluding groundwater extractions could prevent human exposure, the court nevertheless found RCRA's imminent and substantial endangerment threshold met.¹¹⁹

114. *Sullins v. ExxonMobil Corp.*, 729 F. Supp. 2d 1129 (N.D. Cal. 2010).

115. *Id.* at 1135-36 (citing *Price v. U.S. Navy*, 39 F.3d 1011, 1019 (9th Cir. 1994)) (emphasis added).

116. *Id.* at 1136.

117. *Id.*

118. *Id.* at 1137.

119. *Id.* at 1136-37.

Stoll v. Kraft Foods Global, Inc.: Concurrent administrative proceedings often add another layer of complexity to the courts' imminent and substantial endangerment analyses. In 2010, a district court in Indiana found that soil and groundwater contamination, and the accompanying threat of vapor intrusion, *could* constitute an imminent and substantial danger.¹²⁰ The defendant urged that the RCRA citizen suit should be dismissed or stayed on the grounds that "the site of the contamination [wa]s subject to an ongoing clean-up order under the supervision and oversight of U.S. EPA."¹²¹ The court held that the on-going EPA cleanup did not "remove[] [or moot] any 'imminent and substantial danger,'" distinguishing a case in which remediation activities were *completed* and a "No Further Remediation" letter issued.¹²² Similarly, the defendant claimed, citing the on-going EPA-supervised cleanup, that: (1) the doctrine of primary jurisdiction doctrine required dismissal; (2) the plaintiffs' request for injunctive relief was moot; and (3) the plaintiffs' common law claims for injunctive relief were preempted by RCRA.¹²³ The court roundly rejected each of the defendant's theories. First, the court noted that the RCRA suit was compatible with the on-going EPA-supervised cleanup. Moreover, according to the court, no final remediation had been approved, meaning "any forthcoming relief [wa]s indefinite and . . . incomplete."¹²⁴ Finally, the court held RCRA specifically permits alternative causes of action under "any statute or common law."¹²⁵ Importantly, however, the defendant was *not* a

120. *See* *Stoll v. Kraft Foods Global, Inc.*, No. 1:09-CV-0364-TWP-DML, 2010 U.S. Dist. LEXIS 92926 (S.D. Ind. Sept. 6, 2010). The court noted that EPA expressed concerns about vapor intrusion at the site because the "groundwater in the vicinity . . . is very shallow." *Id.* at *8. After investigation of the vapor intrusion pathway, the defendant developed a vapor intrusion mitigation plan and installed temporary vapor mitigation units in 125 homes. *Id.* at *8-9.

121. *Id.* at *2.

122. *Id.* at *27. Note, however, that sites where "no further action" letters have issued arguably may give rise to imminent and substantial danger *if* the vapor intrusion threat was not adequately characterized and remediated.

123. *Id.* at 24-32.

124. *Id.* at 30-31.

125. *Id.* at *17-34.

party to an EPA Order at the site—a fact assigned considerable weight by the court.¹²⁶

SPPI-Somersville v. TRC Cos.: In a similar dispute, the California federal court in *SPPI-Somersville* determined that plaintiffs' RCRA claims were barred because they sought relief "already . . . provided outside of th[e] lawsuit" in the form of a Consent Order issued by Cal. DTSC.¹²⁷ Moreover, the court held that vapor intrusion did not pose an imminent and substantial danger because human occupied structures were only planned for the site—defeating plaintiffs' claims that there was an existing threat.¹²⁸ Accordingly, the court granted the defendants' motion for summary judgment on the plaintiffs' RCRA claims.¹²⁹ In a decision handed down on the same day as *SPPI* and arising from the same site, the court in *West Coast Home Builders, Inc. v. Aventis Cropscience USA, Inc.* employed virtually the same RCRA analysis to reject the plaintiffs' claims for relief based on an alleged vapor intrusion threat.¹³⁰

Importantly, there are several key distinctions between *Stoll* and *SPPI/West Coast*. In *SPPI/West Coast*, Cal. DTSC had issued a "Remedial Action Order" and a "Remedial Action Plan;" in addition, one of the defendants had entered into a Consent Order with Cal. DTSC.¹³¹ By contrast, no final remediation order had been issued in *Stoll* and, again, the defendant was not a party to the governing EPA Order. Despite these differences, however, there remains a tension between the *Stoll* and *SPPI/West Coast* decisions. Indeed, the court in *Stoll* opined that even if the defendant were a party to the EPA Order, it would not be "a foregone conclusion that any order of th[e] [c]ourt w[ould] interfere or actually conflict with the orders of the EPA."¹³²

126. *Id.* at *19-23, *28-30.

127. *SPPI-Somersville v. TRC Cos.*, No. C 04-2648 SI, 2009 WL 2612227, at *15 (N.D. Cal. Aug. 21, 2009).

128. *Id.* at *15-16.

129. *Id.* at *17.

130. *W. Coast Home Builders, Inc. v. Aventis Cropscience USA, Inc.*, No. C 04-2225 SI, 2009 WL 2612380 (N.D. Cal. Aug. 21, 2009).

131. *Id.* at *2.

132. *Stoll v. Kraft Foods Global, Inc.*, No. 1:09-CV-0364-TWP-DML, 2010 U.S. Dist. LEXIS 92926, at *21 (S.D. Ind. Sept. 6, 2010).

Taken together, a few principles can be derived from these decisions regarding vapor intrusion-related claims under RCRA. Foremost, vapor intrusion can be a potential “imminent and substantial endangerment” trigger under RCRA. Second, the presence of agency oversight and existing remediation efforts presents complex jurisdictional barriers to judicial involvement. Courts may be less willing to interject themselves into the remediation process when remediation (rather than investigative) plans have been implemented and defendants clearly are bound by those plans. Nonetheless, even a *completed* remediation plan may not bar RCRA citizen suits when the vapor intrusion threat has not been adequately remediated or mitigated.¹³³ Third, it is quite difficult to predict what factual circumstances will suffice to constitute an imminent and substantial endangerment. Plainly, egregious facts such as those in *Apex* (where contaminant concentrations in indoor air exceeded applicable regulatory thresholds by several orders of magnitude and there was a record of illness, fire, and explosions resulting from contamination) would suffice to constitute an imminent and substantial endangerment.¹³⁴ When there is limited data or no data regarding indoor air concentrations, however, the outcome is difficult to predict. The courts in *Grace* and *Newark*, for instance, required that plaintiffs demonstrate a complete pathway for human exposure to vapors.¹³⁵ For other courts, seemingly, the decision turns on whether human residences overlay—or may overlay—contaminated soil or groundwater. In *Sullins*, the court held that even a city’s *long-term* plans for redevelopment (i.e., those in a “Specific Plan”) were sufficient to create an imminent and substantial threat of endangerment when the groundwater underlying the site of such redevelopment was contaminated.¹³⁶

133. See Suzanne M. Avena, *The Chilling Impact of Vapor Intrusion*, 193 N.J. L.J. 133, July 21, 2008, <http://www.garfunkelwild.com/AttyPublications/Attorney%20Files/Avena/SMA-NJLJ-Vapor%20Intrusion.pdf>.

134. *United States v. Apex Oil Co.*, No. 05-CV-242-DRH, 2008 WL 2945402, at *63 (S.D. Ill. July 28, 2008).

135. *Grace Christian Fellowship v. KJG Invs. Inc.*, No. 07-C-0348, 2009 U.S. Dist. LEXIS 76954, at *1 (E.D. Wis. Aug. 7, 2009); *Newark Grp. v. Dopaco, Inc.*, No. 2:08-CV-02623-GEB-DAD, 2010 U.S. Dist. LEXIS 40150, at *19 (E.D. Cal. Apr. 1, 2010).

136. *Sullins v. ExxonMobil Corp.*, 729 F. Supp. 2d 1129 (N.D. Cal. 2010).

By contrast, the court in *SPPI/West Coast* found that planned development was *not* sufficient to constitute an imminent and substantial endangerment.¹³⁷ Ultimately, these divergent decisions serve to perpetuate uncertainty—especially among property developers—who may be placed in the difficult situation of being both unable to secure RCRA relief because development plans are not final *and* unable to finalize development plans (e.g., secure financing and applicable environmental approvals) because of existing contamination.¹³⁸

2. State Case Law Involving Vapor Intrusion

Plaintiffs and state regulatory agencies are increasingly paying attention to vapor intrusion issues and pursuing stated court actions involving vapor intrusion issues. The following is a sampling of such state cases:

137. *SPPI-Somersville v. TRC Cos.*, No. C 04-2648 SI, 2009 WL 2612227, at *15 (N.D. Cal. Aug. 21, 2009); *W. Coast Home Builders, Inc., v. Aventis Cropscience USA, Inc.*, No. C 04-2225 SI, 2009 WL 2612380 (N.D. Cal. Aug. 21, 2009).

138. There are also court decisions that do not directly address the merits of the vapor intrusion claims, but are good examples of the various contexts in which vapor intrusion claims arise and the increasing propensity by plaintiffs to allege claims based on the vapor intrusion pathway.

In the recent *Voggenthaler* litigation, the court granted a motion brought by the defendants to compel certain non-parties' compliance with a subpoena for soil-gas testing. *See Voggenthaler v. Md. Square, L.L.C.*, No. 2:08-CV-01618-RCJ-GWF, 2011 WL 112115, at *14 (D. Nev. Jan. 13, 2011). The court held that the moving parties made a sufficient factual showing that the non-parties may have contributed to "the PCE plume(s) underlying the residential neighborhood in which PCE vapor intrusion has occurred" to justify the subpoena's issuance. *Id.* at *13. As *Voggenthaler* demonstrates, the privacy concerns of individuals may be subjugated to the need to investigate contamination—even where "[t]he justification is . . . borderline." *Id.* Moreover, in *Action Mfg. Co. v. Simon Wrecking Co.*, an action arising under CERCLA and Pennsylvania's Hazardous Sites Cleanup Act, a group that entered into a consent decree to cleanup a contaminated Superfund site initiated a contribution action against Simon Wrecking Co. (Simon). *See Action Mfg. Co. v. Simon Wrecking Co.*, 428 F. Supp. 2d 288, 332 (E.D. Pa. 2006). The court, in allocating response costs among the liable parties, considered whether to add an uncertainty premium to Simon's share. *Id.* at 331-33. The court noted that cleanup costs might be higher than expected, in part because the EPA's five year review prompted an assessment of the potential for vapor intrusion. *Id.* This case illustrates what may become a more common occurrence: increasing cleanup costs at Superfund sites as a result of previously overlooked vapor intrusion threats.

Carson Coalition for Healthy Families v. City of Carson: The California Second District Court of Appeal considered a community group's challenge to an Environmental Impact Report (EIR) certification and final project approval by the City of Carson.¹³⁹ The Coalition claimed, in part, that the City abused its discretion by failing to evaluate the existence of contaminants in an area of the proposed project.¹⁴⁰ In assessing this claim, the court noted that the EIR recommended "deeper soil-vapor sampling" to evaluate potential vapor intrusion.¹⁴¹

Court House Plaza Co. v. City of Palo Alto: In a recent decision in the California Sixth District Court of Appeal, the court affirmed an order awarding attorneys' fees to petitioners who successfully forced the City of Palo Alto (Palo Alto) to revise a mitigated negative declaration (MND) to consider a potential vapor intrusion threat.¹⁴² Despite a consultant's finding that various VOCs exceeded screening criteria established by the State Water Board, Palo Alto initially circulated a MND for comment without incorporating vapor intrusion.¹⁴³

Both *Court House Plaza Co.* and *Carson Coalition* indicate that the assessment of soil vapor intrusion is becoming a component of the California Environmental Quality Act review process. Indeed, a party that fails to assess vapor intrusion may risk delaying project approvals and may incur costly attorney fees.

Citizens' Environmental Coalition, Inc. v. New York State Department of Environmental Conservation: The petitioners in *Citizens* challenged the New York Department of Environmental Conservation's (DEC) regulations governing the cleanup of Brownfield sites.¹⁴⁴ Specifically, the petitioners asserted that the regulations failed to set specific soil cleanup

139. *Carson Coal. for Healthy Families v. City of Carson*, No. B194923, 2007 WL 3408624 (Cal. Ct. App. Nov. 16, 2007).

140. *Id.* at *3.

141. *Id.* at *17.

142. *Court House Plaza Co. v. City of Palo Alto*, No. H032872, 2010 WL 2625263, at *1 (Cal. Ct. App. June 30, 2010).

143. *Id.*

144. *In re Citizens' Env'tl. Coal., Inc. v. N.Y. State Dep't of Env'tl. Conservation*, 871 N.Y.S.2d 435, 436 (N.Y. App. Div. 2008).

objectives (SCOs) to address the threat of soil vapor intrusion.¹⁴⁵ In rejecting this contention, the court held that the DEC rationally determined that the setting of SCOs for soil vapor intrusion would have been impractical and ineffective to protect the public health.¹⁴⁶ The court reasoned that generic SCOs would have been inappropriate and unprotective at many sites, and that—because soil contaminate concentrations alone do not determine the level of vapor intrusion at a site—DEC already required an evaluation of the vapor intrusion pathway at *every* site.¹⁴⁷ The court’s decision illustrates the complex, multi-variable nature of assessing the vapor intrusion pathway. Notably, increasing regulatory interest in New York may be a sign of things to come. The DEC has re-opened the investigation of 430 “no further action” sites to investigate vapor intrusion pathways.¹⁴⁸

Overall, vapor intrusion may add unexpected cleanup costs to sites long-thought to be safely contained or remediated. Moreover, to further complicate matters, CERCLA’s delayed discovery rule may allow the courts to entertain citizen suits stemming from newly-discovered vapor intrusion at such sites. Finally, as the California example illustrates, vapor intrusion should be a consideration during the environmental review phase of many projects.

E. Toxic Tort Suits¹⁴⁹

Lawsuits with vapor intrusion claims have also invaded the toxic tort arena.

In December 2008, the Appellate Division of the Supreme Court of New York decided a landmark vapor intrusion matter in

^{145.} *Id.*

^{146.} *Id.* at 437.

^{147.} *Id.*

^{148.} *See Avena, supra* note 133.

^{149.} Though regulatory actions and toxic tort actions are separated in this article for organizational purposes, note that vapor intrusion-related lawsuits may often have both environmental statute and common law components. *See, e.g., Bd. of Cnty. Comm’rs of La Plata v. Brown Grp. Retail*, 598 F. Supp. 2d 1185 (D. Colo. 2009) (county sued party potentially responsible for a contaminated site, alleging CERCLA, RCRA, and state common law claims).

*Aiken v. General Electric Co.*¹⁵⁰ The case centered on General Electric Co.'s (GE) alleged contamination of soils with TCE more than three decades ago.¹⁵¹ In 1983, GE entered into a settlement with homeowners who alleged property damages stemming from the contamination of groundwater with TCE; the terms of the settlement were sealed by stipulation.¹⁵² In 2005, testing performed by GE at the behest of the DEC established that vapors from the contaminated soil and groundwater had migrated into overlying residences, leading to vapor intrusion claims from a *new* set of plaintiffs that were not part of the previous settlement.¹⁵³ The new plaintiffs commenced the instant action in 2006, alleging that their properties were damaged by vapor intrusion.¹⁵⁴

In a motion for summary judgment, GE argued that the new plaintiffs' claims were time-barred and should have been commenced within three years of the discovery that the groundwater was contaminated with TCE, i.e., more than two decades prior.¹⁵⁵ The court denied GE's motion, noting that a question of fact existed as to whether the plaintiffs "should have been reasonably aware of the presence of soil vapor contamination and the threat it presented."¹⁵⁶ The court set forth the relevant inquiry as "when, based on an objective level of awareness of the dangers and consequences of the particular substance, 'the injured party discovers the *primary condition* on which the claim is based.'"¹⁵⁷ The court noted that the plaintiffs had been informed for more than two decades that there were no immediate health hazards relating to the site, but only later discovered the potential threat from vapor intrusion via public announcement.¹⁵⁸ In effect, the court's ruling characterizes the vapor intrusion pathway as a "primary threat" distinct from the original soil contamination.

150. *Aiken v. Gen. Elec. Co.*, 869 N.Y.S.2d 263, 264 (N.Y. App. Div 2008).

151. *Id.*

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.* at 265.

157. *Id.* (emphasis added) (internal citation omitted).

158. *Id.*

One commentator has characterized the court's ruling as "a dramatic departure from the well-established jurisprudence governing the statutes of limitations and the delayed discovery rule"—which could "create substantial uncertainty for defendants."¹⁵⁹ Indeed, given that vapor intrusion is a developing field and that many contaminated sites are being reevaluated, such a precedent could create "new life" for toxic tort plaintiffs whose claims were previously thought to be time-barred.

In *Bonds v. Nicoletti Oil, Inc.*, a federal district court in California considered, in part, the defendants' motion to dismiss a lawsuit alleging nine causes of action stemming from the release of VOCs into the soil and groundwater and subsequent volatilization into plaintiffs' properties.¹⁶⁰ The plaintiffs contended that "gasoline, diesel fuel, aviation fuel, other petroleum hydrocarbons, and/or benzene leaked from underground and aboveground storage tanks and supply lines" and that these "[l]eaks from the storage tanks . . . migrated into and contaminated the soil and groundwater" on their respective property.¹⁶¹ Considering the defendants' claims that each cause of action was barred by the statute of limitations, the court first determined that plaintiffs' negligence, private nuisance, and trespass actions were not barred under the "continuing wrong" doctrine—under which the statute of limitations does not begin to run as long as (certain) tortious conduct is continuing.¹⁶² The court noted plaintiffs' allegations that the defendants, beginning in 1988 and continuing until the date of the complaint, caused or permitted the release of contaminants and failed to remediate those contaminants "so that the contaminants migrated under properties owned by plaintiffs and into subadjacent groundwater, and in such a manner as to be injurious to plaintiffs' health and property."¹⁶³ With respect to the plaintiffs' remaining theories,

159. Tu-Quyen Pham & Sarah M. Schlosser, *Vapor Intrusion: New Exposures, Old Sites*, LAW360, March 6, 2009, <http://productliability.law360.com/articles/89428>.

160. *Bonds v. Nicoletti Oil Inc.*, No. CV-F-07-1600 OWW/DLB, 2008 WL 281532, at *1-3 (E.D. Cal. Jan. 30, 2008).

161. *Id.* at *1.

162. *Id.* at *7-9.

163. *Id.* at *8.

the court noted that the plaintiffs were required to plead California's delayed discovery rule, under which:

[T]he period of limitations will begin to run without regard to whether the plaintiff is aware of the specific facts necessary to establish his claim, provided that he has a 'suspicion of wrongdoing,' which he is charged with once he has 'notice or information of circumstances to put a reasonable person on inquiry.'¹⁶⁴

The court dismissed with leave to amend plaintiffs' fraudulent concealment, intentional and negligent infliction of emotional distress, unlawful business practice, declaratory relief, and equitable indemnity claims for failure to adequately plead the delayed discovery rule.¹⁶⁵

Notably, the circumstances in *Bonds* were quite unlike those in *Aiken*: the plaintiffs in *Bonds* contended that they had no notice of any contamination until the Regional Water Board sent each plaintiff a letter notifying them of the possibility of contamination; the defendants noted that—eleven years prior—monitoring wells had been installed within 175 feet of plaintiffs' properties, blocking traffic lanes in the process.¹⁶⁶ In *Aiken*, of course, the plaintiffs contended that they were unaware of the threat of vapor intrusion (not the contamination generally), and the court treated the vapor intrusion pathway as the "primary condition" upon which plaintiffs' claims were predicated.¹⁶⁷

In addition to statutes of limitation, applicable public health criteria are also a key consideration in vapor intrusion-related tort claims. In *Martin v. Foster Wheeler Energy Corp.*, for instance, the court mentioned vapor intrusion in the context of approving a class action settlement.¹⁶⁸ The court noted, in analyzing the "risk of establishing damages," that measurements of TCE in indoor air were not found to constitute a public health

164. *Id.* at *10 (internal citations omitted).

165. *Id.* at *16.

166. *Id.* at *14.

167. *Aiken v. Gen. Elec. Co.*, 869 N.Y.S.2d 263 (N.Y. App. Div. 2008).

168. *Martin v. Foster Wheeler Energy Corp.*, No. 3:06-CV-0878, 2007 U.S. Dist. LEXIS 92021, at *21-22 (M.D. Pa. Dec. 14, 2007).

threat pursuant to ATSDR standards.¹⁶⁹ Thus, the court concluded that it would be difficult for the plaintiffs to establish damages relating to vapor intrusion.¹⁷⁰ As this common sense reasoning suggests, it will likely be difficult for plaintiffs to maintain vapor intrusion-related claims when indoor levels of VOCs are below applicable risk thresholds.

However, plaintiffs have found success in various cases involving vapor intrusion. In *Antolovich v. Brown Group Retail, Inc.*, for instance, the plaintiffs were awarded more than two million dollars in damages stemming from vapor intrusion.¹⁷¹ In *Muniz v. Rexnord Corp.*, a group of plaintiffs representing a class of homeowners living near an industrial park in Illinois brought claims against several park property owners under RCRA and Illinois common law, claiming that VOCs in the soil and groundwater were migrating from the industrial park toward their homes and contaminating their water and volatilizing into their homes.¹⁷² Following the court's certification of the plaintiffs' class, the parties in *Muniz v. Rexnord* ultimately settled for approximately \$15.75 million in 2006.¹⁷³

In sum, even where claims alleging exposure through ingestion or dermal contact pathways (i.e., groundwater and soil) are time-barred, claims alleging exposure through the vapor intrusion pathway may be permissible. However, the issue of proving causation may be even more complex than usual in the vapor intrusion setting. It is difficult to determine whether elevated chemical concentrations in indoor air are due to vapor intrusion, an indoor source, or concentrations in the ambient air (i.e., outside sources). For instance, alternative sources of VOCs include architectural coatings, cleaners, disinfectants, and

169. *Id.*

170. *Id.*

171. *Antolovich v. Brown Grp. Retail, Inc.*, 183 P.3d 582, 591 (Colo. App. 2007).

172. *Muniz v. Rexnord Corp.*, No. 04C2405, 2004 US Dist. LEXIS 17939, at *4-7 (N.D. Ill. Sept. 1, 2004).

173. *See Muniz v. Rexnord Corp.*, No. 04C2405, 2005 U.S. Dist. LEXIS 10472, at *17 (N.D. Ill. Feb. 10, 2005) (granting class certification); *Rexnord Indus. L.L.C. v. RHI Holdings, Inc.*, 906 N.E.2d 682, 683 (Ill. App. Ct. 2009) (discussing the terms of the *Muniz v. Rexnord* settlement).

degreasers.¹⁷⁴ Moreover, there are a host of variables that affect the migration of chemical vapors through soils and indoor spaces, including soil properties, barometric pressure, rainfall, construction style, foundation porosity, and the operation of ventilation systems.¹⁷⁵ Measurements of indoor air quality often vary widely within the same building.¹⁷⁶ Notwithstanding the causation proof challenges, it is clear that public health criteria will play a key role in toxic tort suits. Indeed, the importance of such criteria may explain EPA's delay in revising toxicity values for such chemicals as TCE, dichloroethylene, and PERC.

III. CONCLUSION

Vapor intrusion assessments are often a necessary part of the environmental due diligence process. Moreover, regulatory interest in vapor intrusion is quickly increasing. The host of guidance documents currently circulating is indicative of these developments, though the overlapping recommendations therein may create more confusion than certainty.

Although the mechanics of vapor intrusion are complex, the court's decision in *Apex* indicates that the dynamics of vapor intrusion are sufficiently understood to satisfy RCRA's liability threshold (and likely the parallel threshold in CERCLA). Furthermore, the scientific community is actively investigating the potential health risks associated with exposure to VOCs¹⁷⁷ and developing new vapor intrusion pathway modeling. This will lead to a greater understanding of vapor intrusion and potentially increasing litigation.

174. EPA DRAFT GUIDANCE, *supra* note 3, at 5.

175. WISCONSIN GUIDANCE, *supra* note 4, at 1-2.

176. *Id.*

177. EPA published a revised Toxicological Review of TCE in September 2011. See EPA, TOXICOLOGICAL REVIEW OF TRICHLOROETHYLENE (Sept. 2011), *available at* <http://www.epa.gov/iris/toxreviews/0199tr/0199tr.pdf>. For *continuous* inhalation exposure, EPA estimates that exposure to levels at or below .002 milligrams ("mg")/cubic meter ("m³") will not result in appreciable risk of deleterious effects during one's lifetime. *Id.* at xliii. EPA published a PERC review in February 2012. EPA, TOXICOLOGICAL REVIEW OF TETRACHLOROETHYLENE (PERCHLOROETHYLENE) (Feb. 2012), *available at* <http://www.epa.gov/iris/toxreviews/0106tr.pdf>. For continuous inhalation exposure of PERC, EPA estimates the concentration at or below which no appreciable risk is expected at .04 mg/m³. *Id.*

Critically, the risks associated with vapor intrusion may lead to the reopening of Superfund sites and parallel state sites previously thought to be safe. Because the risks of vapor intrusion have only recently begun to be understood, these risks may have been ignored at many such sites over the last several decades. Given CERCLA's delayed discovery rule and the *Aiken* ruling, the door for citizen suits and toxic tort actions may be kept open—an alarming concept for those who, having closely adhered to agency cleanup orders, thought themselves finally done.