
Six Things the Private Sector Should Know About EPA's Final Vapor Intrusion Guidance

By William J. Walsh / Aug 24, 2015

The cumulative impact of the EPA guidance is to require the generation of more data, which means more sampling and analysis, more frequent and stringent remediation, and potentially higher remediation costs.

At long last, the Environmental Protection Agency (EPA) has issued its final technical guidance on vapor intrusion (VI Guidance or Guidance).¹ It is detailed and reaffirms many prior EPA VI policies. This alert, however, focuses on six critical aspects where EPA has added new recommendations or modified prior recommendations, which will likely make compliance significantly more complex, stringent and/or costly.

The Guidance is particularly significant because of its impact on the assessment of volatile organic chemicals (VOCs), which are present at many contaminated groundwater sites (e.g., 78 percent of Superfund sites, 57 to 69 percent of Department of Defense remediation sites in one survey, many underground storage tanks, and virtually all of the historic dry cleaning facility sites).²

It is critical to understand that the Guidance is subject to professional judgment and interpretation and should not be universally applied at all sites. Many preferences and assessment pathways in the VI Guidance are narrowed or expanded on in other parts of the Guidance or are fact-specific. Additionally, in some cases, the VI Guidance needs to be viewed in light of other distinguishing or inconsistent remediation guidances and historic remediation practices. Despite the natural tendency for regulators to follow their guidance rigidly, it should be kept in mind that guidance, by definition, is not legally binding.³ Therefore, potentially responsible parties (PRPs) may seek a site-specific decision different from the "preferences" articulated in the VI Guidance. Thus, an important decision for PRPs is when to urge the individual regulator to "dare to be different" by engaging the regulator and building an administrative record (to put it more colloquially, know when to hold them and when to fold them).

1. The Guidance is biased toward early action and preemptive mitigation.

The Guidance states that regulators and PRPs "may choose to pursue pre-emptive mitigation (i.e., early action) at some buildings rather than, for example, conduct multiple rounds of sampling over a few years to establish an estimate of long-term average exposure concentration and characterize temporal variability.⁴ Temporary relocation (one potential interim or early action that has increasingly been utilized) "may warrant consideration" where an explosion hazard is present or where "short-term or acute exposures may pose unacceptable human health risk . . . that cannot be addressed timely or feasibly by implementing engineered exposure controls."⁵

EPA advises regulators to balance more sampling and preemptive mitigation "with a bias for initiating response actions necessary or appropriate to eliminate, reduce, or control hazards posed by a site as early as possible."⁶ Implementation of remedial measures may be selected even though there are only limited lines of evidence or measurements, e.g., EPA suggests that there may be a "reasonable basis to take pre-emptive action" when VI has been documented at neighboring structures.⁷ Similarly, EPA states that preemptive, cost-effective engineered exposure controls may be appropriate in newly constructed buildings, or during future development or redevelopment, rather than triggering action after VI has occurred.⁸

EPA's recommendation to implement early/interim action is based on "precaution" and EPA's assumptions that:

- It is "typically" cost-effective to protect human health relatively quickly, rather than waiting years to delineate or remediate the plume.
- The VI investigations can be disruptive for building occupants (residents, workers, etc.) and owners.
- Building occupants and owners and others "may have questions and concerns about human health risk that are or may be posed via vapor intrusion."⁹

PRPs, therefore, will be faced at many sites (to a greater extent than previously has been the case) with the decision of whether to initiate interim/early action, including temporary relocation in the context of remedy selection. Similarly, assessing this remediation risk will be more complex in a transactional due diligence inquiry. Even with greater specificity in the VI Guidance, the ultimate remedy selection decision is fact-specific and requires a careful weighing of the Guidance factors to determine what is appropriate. For example, EPA's assumptions (such as those cited above) may not apply at a particular site.

Some PRPs may prefer to take interim action when a business case can be made. For example, a PRP may agree to take interim/early action if: (a) liability is clear; (b) the interim/early remedy being sought by the regulator is simple, effective and less costly than the other potential remedy alternatives (e.g., installation of a passive or active vapor collection system between the contaminated plume and the building versus permanent relocation of residents or workers, or taking early action versus performing extensive sampling to decide on the appropriate remedy); and (c) the action minimizes the likelihood or scope of property damage/personal injury litigation. In particular, there may be situations where the cost of gathering data is high and there is a reasonable likelihood that some action may eventually be necessary over the likely long life of many contaminated groundwater plumes.¹⁰

Estimating data-gathering costs is particularly difficult because, as a practical matter, the amount of sampling required is uncertain. Sampling and potential enforcement costs are also more likely to be high if a PRP resists undertaking a preemptive interim or early action. The length of such monitoring at a significant number of sites is likely to be very long, thereby increasing long-term sampling costs. In some situations, site conditions and uses are almost

certain to change (affecting the amount of sampling required by regulators). If action to minimize exposure only occurs after extensive monitoring is available, local residents and workers will face uncertainty for a longer period of time, thereby raising concerns of property damage and personal injury.¹¹

In any case, PRPs need to consider the potential impact of implementing or not implementing interim/earlier action on potential property damage or personal injury claims.¹² Unfortunately, this is not straightforward. In many cases, collecting more data can be favorable to a PRP (by demonstrating that exposure is not occurring or that the reasonable maximum exposure levels are below concentrations that might support a property damage or personal injury claim), and preemptive relocation might increase the likelihood that residents or workers will file a lawsuit. In other cases, collecting additional data, such as by sampling indoor air, may increase property and personal injury concerns, and taking early or interim action may be viewed as a good faith effort to mitigate any potential damage. Thus, there is no one-size-fits-all approach to guide PRPs making the decision to implement interim/early action.

2. EPA prefers actions that eliminate or substantially reduce the level of vapor-forming chemicals via more expensive treatment or removal alternatives.

Installing engineered exposure controls to reduce or eliminate VI in buildings or to reduce indoor air exposure levels (including ventilation, overpressurization and other common VI remedies) are considered “interim” or “early” response actions.¹³ Thus, EPA prefers the most expensive remedial actions (soil removal or treatment in situ), treatment of groundwater, removal of groundwater or decontamination of sewer or utility lines.¹⁴

The fact that EPA has a preference does not mean that its preference will be selected as the remediation method. The VI Guidance’s preference must be reconciled with the language of the statute (as interpreted by the courts), other guidances that require the remedy selection criteria (including practicality and cost-effectiveness) be “balanced” to select the “most appropriate solution for the site,¹⁵ and past practice. During the period from 1998 to 2011, EPA selected remedies that included source containment or offsite disposal (i.e., not complete removal or treatment) at 64 percent of the Superfund sites.¹⁶ At approximately 10 percent of the contaminated groundwater sites, the National Academy of Sciences concluded “regardless of the technology used, the complete removal of contaminant mass at complex sites [~10 percent of the sites] is unlikely.¹⁷

Courts have long refused to defer to an agency’s interpretation (a) “when the agency’s interpretation conflicts with a prior interpretation,” particularly where the “potential for unfair surprise is acute,” (b) when there is reason to suspect that the agency’s interpretation “does not reflect the agency’s fair and considered judgment on the matter in question,” or (c) when the agency’s interpretation is “plainly erroneous or inconsistent with the regulation.¹⁸ Depending on circumstances, one or more of these factors may apply at a VI site.

The VI Guidance preferences may not be consistent with other EPA policy, practice and the inherent limitations on remediation. Thus, building an administrative record demonstrating that a remedial alternative that is not preferred by the VI Guidance is reasonable may convince the regulator to make a site-specific choice that differs from the approach in the VI Guidance.

3. The EPA VI Guidance recommends that the noncancer assessment at VI sites should consider the potential for adverse health effects from short-duration inhalation exposures (i.e., acute, short-term or subchronic exposure durations), as well as longer-term inhalation exposure (i.e., chronic exposure) conditions.

This recommendation¹⁹ is easier articulated than implemented. Hazardous waste site remediation levels have rarely been based on acute, short-term or subchronic exposure durations prior to EPA’s Region 9 guidance requiring remediation action if the mean indoor air concentration of trichloroethylene (TCE) measured over a 24-hour period exceeds 2 µg per cubic meter (µg/m³).²⁰ The VI Guidance does not explicitly cite the TCE’s inhalation reference concentration (RfC) or mention Region 9’s use of a 24-hour indoor air action level. This may be due, in part, to the fact that the EPA RfC for TCE of 2 µg/m³ is based on chronic exposure duration, not a 24-hour exposure, so the Region 9 guidance, on its face, is not consistent with the VI Guidance.

The Guidance recommends that time-integrated measurements from multiple sampling events be used to estimate exposure concentrations appropriate for the exposure (occupancy) scenario being evaluated (e.g., residential versus commercial). Generally, modeling would be used to conservatively estimate exposure concentrations under future conditions in buildings yet to be constructed in areas with subsurface contamination by vapor-forming chemicals.²¹

EPA recommends that action be taken when the measured indoor air concentration divided by the RfC exceeds 1,²² which is quite stringent. However, EPA acknowledges that these screening levels are “not automatically response action levels²³ and an individual subsurface sampling result that exceeds the respective chronic screening level “does not establish that vapor intrusion will pose an unacceptable human health risk to building occupants.”²⁴ EPA also cautions that screening levels “do not account for the cumulative effect of all vapor-forming chemicals that may be present. Thus, if multiple chemicals that have a common, non-cancer toxic effect are present, a significant health threat may exist at a specific building or site even if none of the individual substances exceeds its screening level.²⁵

EPA’s new recommendation to consider adverse health effects from short-duration inhalation exposures may result in a significant increase in the number of VI remedial sites and increased remediation costs.

4. EPA utilizes multiple lines of evidence, but the scientific criteria to meet this evidentiary standard are not well defined.

EPA generally recommends that multiple lines of evidence be developed and their results weighed together when evaluating and making risk-informed decisions pertaining to VI.²⁶ However, the VI Guidance, other EPA guidance and judicial interpretations do not define precisely what evidence (whether singular or multiple lines) is sufficient to demonstrate that a contaminated groundwater plume is the cause of the VI at levels above indoor air remediation

levels or is likely to cause such exceedances in the future.

Some lines of evidence may not be definitive (e.g., indoor air and subsurface concentrations can be greatly variable both temporally and spatially). At worst, some individual lines of evidence may be inconsistent with other lines of evidence. In general, when lines of evidence are not concordant and the weight of evidence does not support a confident decision, EPA recommends reevaluating the conceptual site model (CSM), which may warrant adjusting the CSM to better represent the weight of the available evidence.

5. The distance beyond which structures will not be affected by vapor intrusion should be a site-specific determination.

Many aspects of the VI Guidance require more intensive data gathering. For example, the Guidance recommends against using a de facto 100-foot buffer at landfills where methane is generated in sufficient quantities, at commercial or industrial settings where a vapor-forming chemical(s) has been released within an enclosed space, and at sites with pressurized gas transmission lines.²⁷ In other situations, the Guidance recommends a more site-specific analysis,²⁸ particularly for buildings with significant preferential migration routes (e.g., geologic fractures, utility corridors).²⁹ All of these changes increase sampling and evaluation costs.

6. There is no authority for EPA's dismissal of the Occupational Safety and Health Administration (OSHA) permissible exposure levels (PEL) as a basis to determine whether vapor intrusion mitigation is necessary in nonresidential buildings.

EPA's Superfund guidance has long listed and used OSHA PELs as indoor remediation levels for workplace exposure,³⁰ and the EPA VI Guidance fails to explain adequately the legal or factual rationale for this change in policy. Although EPA cites a statement on OSHA's website suggesting that the PELs may be outdated, there is no grant of authority to EPA to regulate where it deems OSHA standards inadequate.³¹

Determining the contribution of VOCs in indoor air due to VI from a contaminated groundwater plume versus caused by normal industrial plant operations is inherently difficult. However, if the industrial operations at a plant alone will result in concentrations above the industrial indoor air remediation level, then addressing the portion of indoor VOC level attributable to the VI groundwater plume will not result in "compliance" with the industrial indoor air remediation level. In fact, the higher the background VOC concentration, the smaller the benefit from remediating the VI component.

In summary, the cumulative impact of the EPA final VI Guidance is to require the generation of more data. This, of course, means more sampling and analysis and potentially higher remediation costs. In some situations, the facts may well support such approaches. However, if past is prelude, many regulators may be even more "biased" than the literal language of the Guidance recommends. Thus, PRPs will need to consider the data gathered and remedial options with a degree of scrutiny and exercise judgment to a greater extent than historically has been the case.

Endnotes

1 See OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air at 3-4 (June 2015), available at <http://www.epa.gov/oswer/vaporintrusion/documents/OSWER-Vapor-Intrusion-Technical-Guide-Final.pdf> [hereinafter EPA's 2015 Final VI Guidance].

2 Committee on Future Options for Management in the Nation's Subsurface Remediation Effort National Research Council of NAS, *Alternatives for Managing the Nation's Complex Contaminated Groundwater Sites* at 31, 32, 33-36, 39-40 (2013) (prepublication copy), available at <http://www.nap.edu/catalog/14668/alternatives-for-managing-the-nations-complex-contaminated-groundwater-sites> [hereinafter NAS (2013)].

3 Memorandum from William Farland, Director, Office of Health and Environmental Assessment, and H. Longest, Director, Office of Emergency and Remedial Response, to Directors, Regional Offices (Dec. 21, 1993); *Gen. Elec. Co. v. EPA*, 290 F.3d 377 (D.C. Cir. 2002) (vacating EPA's use of PCB cancer potency without notice and comment); *Gen. Elec. Co. v. Browner*, No. 93-1251, slip op. at 2 (D.C. Cir. Oct. 26, 1993) (EPA must "consider all credible and relevant information before it, . . . if any outside party questions IRIS values during the course of a proceeding" and "entry of a value on IRIS is not entitled to conclusive weight, and does not make the value legally binding"); *Util. Solid Waste Activities Group v. EPA*, 236 F.3d 749 (D.C. Cir. 2001) (setting aside a regulation that relied on a cancer potency that had not been issued after notice and comment).

Furthermore, as the Seventh Circuit noted in reviewing a Region 5 guidance on the use of a cancer potency for dioxin, an EPA Region "is not the 'Administrator'. Its policy statement is a go-it-alone document separate from the Administrator's advice to the states. Unless the Administrator later applies the policy statement . . . to [a company], nothing will come of it." *Am. Paper Institute v. EPA*, 882 F.2d 287 (7th Cir.1989).

4 EPA's 2015 Final VI Guidance, *supra* note 1, at 125, 134.

5 *Id.* at 43.

6 *Id.* at 4-5.

7 *Id.* at 43.

8 *Id.*

9 *Id.* at 43-44. ASTM E2790 – 11: Standard Guide for Identifying and Complying With Continuing Obligations also recommends that companies that are

constructing residential or commercial structures over or near a TCE groundwater plume consider installing a vapor barrier or sub-slab ventilation system, particularly when such a passive VI prevention system can be installed during future site development prior to the construction of homes or new commercial offices.

10 NAS (2013), *supra* note 2, at 3, 54, 201.

11 By definition, if VI is being addressed at a contaminated groundwater site, regulators have determined that there is or may be in the future a complete pathway, i.e., residents or workers are currently inhaling the volatile chemicals of concern.

12 NAS (2013), *supra* note 2, at 185–191.

13 EPA Final VI Guidance, *supra* note 1, at 41, 133.

14 *Id.* at 143.

15 NAS (2013), *supra* note 2, at 61–55 (summarizing EPA remedy selection guidance)

16 EPA, Superfund Remedy Report at 8 (14th ed. 2013), available at https://clu-in.org/download/remed/asr/14/SRR_14th_2013Nov.pdf.

17 NAS (2013), *supra* note 2, at 3, 54, 201.

18 *Christopher v. SmithKline Beecham Corp.*, 132 S. Ct. 2156, 2166–58 (2012) (rejecting the Department of Labor’s new interpretation of an existing statutory term).

19 EPA Final VI Guidance, *supra* note 1, at 125–126.

20 Attachment to Letter from EPA, Region 9 to Stephen Hill, Chief Toxics Cleanup Division, California Regional Water Quality Control Board – SF Bay Region, “EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites,” at 1 (Dec. 3, 2013), available at <http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/7a625c26cbf2561e88257c38007610c8!OpenDocument>.

EPA Region 3 required evacuation of two Navy office buildings at its Yorktown, Virginia, facility, based on 24-hour averaged indoor air concentrations that ranged from 31 to 83 µg/m³ and its substantial and imminent threat action level of 27 µg/m³. NavFac, RITS 2013: Vapor Intrusion: Where Are We Today?, at 122, available at http://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/Restoration/er_pdfs/rits/RITS2013_VI_Where_are_we_today_final_20140415.pdf.

We leave for another day the question of whether the EPA RfC for TCE is supported by the scientific evidence.

21 EPA Final VI Guidance, *supra* note 1, at 125.

22 *Id.* at 108.

23 *Id.*

24 *Id.*

25 *Id.*

26 *Id.* at 112, 125.

27 *Id.* at 68.

28 *Id.* at 67.

29 *Id.* at 70.

30 EPA, CERCLA Compliance with Other Laws Manual: Part II. Clean Act Act and Other Environmental Statutes and State Requirements at B-8 (Aug. 1989), available at <http://www.epa.gov/superfund/policy/remedy/pdfs/540g-89009-s.pdf>.

See *United States v. Borowski*, 977 F.2d 27, 31 (1st Cir. 1992).

EPA’s 2002 draft VI guidance stated “[i]n general, therefore, EPA does not expect this guidance be used for settings that are primarily occupational.” EPA, OSWER. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, at 3 (Nov. 2002), available at <http://nepis.epa.gov/Adobe/PDF/900Z0D00.PDF>.

However, “there may be instances (under CERCLA and other cleanup programs) where standards other than the OSHA standards are used to determine

whether the exposure pathway presents a risk to human health.” *Id.* The interior of a place of employment is “not ‘the environment’ for purposes of CERCLA at least to the extent employees are the injured persons.” *Covalt v. Carey Canada Inc.*, 860 F.2d 1434, 1439 (7th Cir. 1988) (some state courts have held the same).

31 EPA Final VI Guidance, *supra* note 1, at 10.

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