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Editor's Note...

by Scott B. Birkey

I write this Editor's Note on the heels of the 25th Anniversary of the Environmental Law Conference at Yosemite®. The Conference is the State Bar Environmental Law Section's marquee event, and over the years it has become an important gathering of lawyers, consultants, policymakers, regulators, and others interested in environmental, natural resource, and land use issues. It's also an opportunity to showcase the broad spectrum of those issues, and the topical line-up of panels, plenary speakers, and presentations for this year's Conference certainly reflected that spectrum. I suppose you could say there's always something for everyone at the Conference. I'd like to encourage all of our Section members and friends to continue to support the Conference and its tradition of creating a space where all of us can gather to get reacquainted, share ideas, and work on perfecting our craft.

Like the annual Conference, the *Environmental Law News* also seeks to showcase that broad spectrum of topics and positions related to environmental law. This issue of the News is no exception. We bookend this issue with articles on the Sustainable Groundwater Management Act, which is an evolving and important statute that has garnered much attention throughout the year. We include an article on the recent Newhall Ranch decision and new standards for the analysis of greenhouse gas impacts under CEQA. We follow that article with a piece on the Clean Power Plan litigation and how that litigation may change, or at least inform, the applicability of the *Chevron* doctrine of deference. We then give you an article on the state of California's regulation of chemicals after recent reforms to the Toxic Substances Control Act and after that an article on the evolving regulation of tricholoroethylene, or "TCE," vapor by federal and state regulatory agencies.

This is my last issue as Editor of the *Environmental Law News*, as I'll be handing the baton to Julia E. Stein, newly appointed to the Section's Executive Committee. I'd like to thank all of the authors who have contributed articles to the *News* during my three-year tenure. I'd also like to thank in particular all of the article editors that tirelessly and with much cheer and intelligence assisted me and the authors in getting all of these articles into print. Thank you!

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THE EVOLVING REGULATION OF TCE VAPOR INTRUSION ISSUES

by Ben Clapp,* Don J. Frost Jr.** and Stacy E. Kray***

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Over the past five years, multiple U.S. Environmental Protection Agency ("EPA") Regions and numerous state environmental agencies have imposed stringent new action levels to address human health risks relating to inhalation of trichloroethylene ("TCE") as a result of vapors intruding into indoor air from subsurface contamination. Because the new action levels are significantly more aggressive than historical regulatory thresholds, these developments could have long-lasting repercussions regarding current and future remedial investigations, and could alter the risk profile of sites that previously received regulatory closure. In addition, the new action levels differ among the various agencies in California, which has created much confusion in the regulated community.

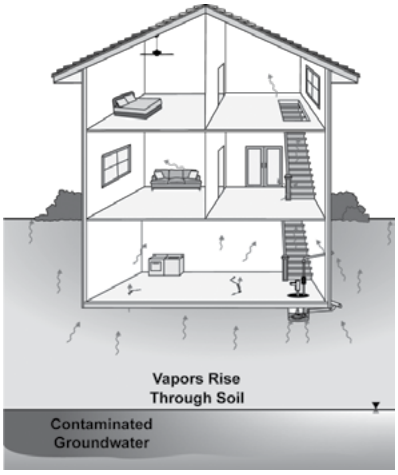

Figure 1: Vapor intrusion into a residence.
Graphic courtesy of U.S. EPA.

I. DEVELOPMENT OF REVISED TCE RESPONSE ACTION LEVELS

TCE is a volatile organic compound that is considered carcinogenic.[1] For many years, it was widely used as a solvent in manufacturing and other industrial operations. The most recent changes to TCE regulation result from evidence that even very low levels of TCE exposure may also present non-carcinogenic risks to human health.[2] These risks have raised regulatory concern about possible inhalation of TCE vapors migrating into indoor air from contaminated soil and groundwater beneath building foundations.

The current approach for TCE regulation dates back to 2011, when EPA released its *Toxicological Review of Trichloroethylene in Support of the Integrated Risk Information System* ("TCE IRIS Assessment").[3] The TCE IRIS Assessment established a non-cancer inhalation toxicity value for TCE ("Reference Concentration") of 2 micrograms per cubic meter (µg/m^3).[4] The Reference Concentration is an "estimate . . . of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime."[5] Relative to previously issued TCE toxicity values, a 2 µg/m^3 Reference Concentration is extremely stringent. For example, the California Office of Environmental Health Hazard Assessment published a chronic reference level for TCE that is 300 times more lenient—at 600 µg/m^3.[6] The primary basis for the Reference Concentration is a disputed 2003 study that reported a dose-response relationship between consumption of TCE in drinking water by pregnant rats and cardiac defects in rat fetuses (the "Johnson Study").[7]

EPA's reliance on the Johnson Study has proven controversial. Critics contend that the methods employed in the study were flawed and that the results have not been replicated by other labs despite various attempts to do so.[8] In February of 2016, EPA denied an industry request for reconsideration of the Reference Concentration under the Information Quality Act.[9] It remains to be seen whether critics of the TCE Reference Concentration will initiate any other legal challenges relating to the standard.

Following the release of the TCE IRIS Assessment, multiple EPA Regions and a number of state agencies revised their response action levels for

addressing TCE vapor intrusion at contaminated sites ("RALs"). Most notably for California lawyers, EPA Region 9 released a two-tiered operational framework in 2014 for addressing TCE vapor intrusion at all Region 9 Superfund sites (the "Region 9 Superfund Framework").[10] The framework adopted the TCE IRIS Assessment's 2 µg/m^3 Reference Concentration as an "accelerated" residential RAL, and accelerated commercial/industrial RALs of 8 µg/m^3 for an 8-hour work day and 7 µg/m^3 for a 10-hour work day. Accelerated response actions contemplate that all response work be completed and confirmed within a few weeks.

The Region 9 Superfund Framework also established "urgent" residential RALs of 6 µg/m^3 and urgent commercial/industrial RALs of 24 µg/m^3 for an 8-hour work day and 21 µg/m^3 for a 10-hour work day. "Urgent" response actions contemplate that all response work will be initiated immediately and completed and confirmed within a few days. An urgent response action can include the temporary evacuation of impacted buildings to prevent additional exposure.

EPA Region 9 TCE Response Action Levels

Media	Units	Accelerated Response	Urgent Response
Indoor Air Residential	µg/m3	2	6
Indoor Air Commercial/Industrial	µg/m3	8*/7**	24*/21**

* Based on 8-hour workday.
** Based on 10-hour workday.

EPA Region 9 had previously signaled its intention to adopt more stringent TCE RALs in a letter issued in December of 2013 ("2013 Region 9 South Bay Letter") to the California Regional Water Quality Control Board—San Francisco Bay Region (the "SF RWQCB"), in which Region 9 provided recommended guidelines for addressing vapor intrusion at nine Superfund sites being remediated in the South San Francisco Bay Area under SF RWQCB oversight ("South Bay Superfund Sites"). The letter included a recommendation that the SF RWQCB incorporate the revised TCE RALs.[11] In addition, the letter required indoor air testing at all properties overlying groundwater with concentrations of TCE at or over 5 µg/L.

EPA Region 3, while not having promulgated official TCE RALs for indoor air, has demonstrated a similar approach to EPA Region 9 by requiring the evacuation of two U.S. Navy buildings with indoor air levels in excess of an "ad hoc" response action level of 27 µg/m^3.[12] Separately, in 2012, EPA Region 10 issued toxicity values for TCE in indoor air at Superfund and RCRA cleanup sites, recommending that for residential settings the average TCE exposure over any 21-day period not exceed the 2 µg/m^3 Reference Concentration, and that for industrial/commercial settings the average TCE exposure over any 21-day period not exceed 8.4 µg/m^3.[13] At the national level, in August 2014, EPA's Director of Superfund Remediation and Technology Innovation issued a memorandum to the Regional Superfund Division Directors encouraging the use of the 2 µg/m^3 Reference Concentration from the TCE IRIS Assessment to support early or interim action at Superfund sites.[14]

A number of state and local environmental agencies have also adopted or revised TCE RALs based on the TCE IRIS Assessment, with Alaska following the lead of Region 10 and Massachusetts, New Jersey, Connecticut, Minnesota and New Hampshire adopting similar approaches. In contrast, Indiana has publicly indicated that it will not follow the TCE IRIS Assessment, concluding that an accelerated response for TCE indoor air exposures is not scientifically supported.[15] California's response is discussed below.

II. IMPLEMENTATION OF NEW TCE STANDARDS AT SOUTH BAY SUPERFUND SITES AND BEYOND

A. Use of New Standards at South Bay Superfund Sites

Recent events at the South Bay Superfund Sites demonstrate some of the possible impacts to responsible parties from the changes in TCE action levels. After the 2013 Region 9 South Bay Letter was issued, the SF RWQCB issued specific directives to potentially responsible parties ("PRPs") for the South Bay Superfund Sites requiring them to revise previously approved workplans to incorporate EPA recommendations from the 2013 Region 9 South Bay Letter (the "SF RWQCB South Bay Directives"), including adhering to Region 9's RALs and requiring vapor intrusion studies on all off-site properties overlying areas of shallow-zone groundwater contamination at or over 5 µg/L of TCE.[16]

In 2014, PRPs at the South Bay Superfund Site submitted petitions for review to the State Water Resources Control Board ("SWRCB"). The PRPs asserted, among other things, that (i) the new TCE RALs were not legally binding because they had not been adopted as regulation or official guidance by EPA, SWRCB, or any other agency;[17] (ii) the RALs were invalid because they were applied in contravention of the SF RWQCB's previously published vapor intrusion standards;[18] (iii) the SF RWQCB South Bay Directives' requirement that the workplans include vapor intrusion evaluation of all buildings overlying the 5 µg/L TCE shallow groundwater contour was

arbitrary and capricious and not supported by the best available science;[19] and (iv) the SF RWQCB's reliance on standards imposed by the 2013 Region 9 South Bay Letter was improper at the South Bay Superfund Sites because they were inconsistent with the final remedy adopted by SF RWQCB and EPA for the facilities at issue.[20] To date, SWRCB has not issued any substantive ruling on these petitions.

B. SF RWQCB Draft Interim Framework & DTSC Human Health Risk Assessment Note

Since it issued the South Bay Directives, the SF RWQCB has sought to expand its implementation of new TCE vapor intrusion standards. In October of 2014, the SF RWQCB issued its Draft Interim Framework for Assessment of Vapor Intrusion at TCE-Contaminated Sites in the San Francisco Bay Region ("SF RWQCB Interim Framework").[21] The SF RWQCB Interim Framework "provisionally" adopts the EPA Region 9 TCE RALs and endorses approaches to sampling both residential and commercial buildings as set forth in the Region 9 Superfund Framework.[22]

Importantly, however, the SF RWQCB Framework does not adopt EPA's directive in the 2013 Region 9 South Bay Letter that indoor air sampling be conducted in all buildings overlying 5 µg/L TCE in groundwater.[23] Instead, SF RWQCB announces "Trigger Levels" for TCE in soil gas and groundwater samples.[24] Trigger Levels are "concentrations in environmental media that prompt prioritization of indoor air sampling."[25]

For soil gas, the Trigger Level is 1,000 µg/m^3 for residential properties and 8,000 µg/m^3 for commercial/industrial properties. For groundwater, the Trigger Level is either (i) 17 µg/L for residential properties and 140 µg/L for commercial/industrial properties with predominantly coarse soils or likelihood of preferential pathways or groundwater that is present at depths of less than 10 feet below ground surface; or (ii) 460 µg/L for residential properties and 3,900 µg/L for commercial/industrial properties with fine grained soils, a lower likelihood of preferential pathways, and groundwater greater than 10 feet below ground surface.[26]

SF RWQCB TCE Trigger Levels

Media	Units	Residential	Commercial
Soil Gas	µg/m3	1,000	8,000
Groundwater #1	µg/L	17	140
Groundwater #2	µg/L	460	3,900

Groundwater #1—groundwater <10 feet, coarse soils, or preferential pathways present

Groundwater #2—deeper groundwater, mix of fine-coarse soils, and preferential pathways unlikely

The SF RWQCB has over 200 active TCE sites in the Bay Area with TCE contamination above 5 µg/L.[27] The SF RWQCB has stated publicly that its new Trigger Levels will be used to help prioritize sites for further action.[28]

 # TCE-impacted Sites Exceeding Groundwater Screening Levels for Vapor Intrusion[29]

Open Cases with TCE Contamination	SF RWQCB	All CA Regions
# Cases with > 5 µg/L (USEPA R9 screening level)	214	1,146
# Cases with > 17 µg/L (SF RWQCB ESLs – Shallow GW Residential Trigger Level)	192	942
# Cases with > 140 µg/L (SF RWQCB ESLs – Shallow GW Residential Trigger Level)	145	611

For its part, the California Department of Toxic Substances Control ("DTSC") responded to the 2013 Region 9 South Bay Letter and Region 9 Superfund Framework in a Human Health Risk Assessment Note issued on August 23, 2014 ("DTSC Risk Assessment Note") by concurring that the TCE RALs are appropriate response standards but also noting that the potential health implications of such measurements may vary based on site-specific conditions.[30] DTSC recommended that regulatory toxicologists be consulted at sites with indoor air concentrations of greater than 1 µg/m^3 (residential) and 3 µg/m^3 (commercial) to aid in determining potential risk.[31]

With respect to the 2013 Region 9 South Bay Letter requirement that testing be conducted at all buildings overlying concentrations of 5 µg/L of TCE in groundwater, DTSC noted that the requirement was based on site-specific factors, including groundwater depth, significant groundwater sampling and modeling of indoor air pathways. With respect to the use of the 5 µg/L TCE standard for groundwater as an action level for indoor air studies at other sites, DTSC stated that it did "not recommend eliminating indoor air measurements of TCE based solely on groundwater concentrations less than 5 µg/l."[32] The remainder of the DTSC Risk Assessment Note provides comment and guidance on the use of EPA's testing methods and protocols at sites in California.[33]

C. Recent U.S. EPA Guidance

With respect to EPA's current policy outside Region 9, in June of 2015, EPA's Office of Solid Waste and

Emergency Response issued its *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Intrusion to Indoor Air* ("EPA 2015 Guidance"). EPA stated that one of the primary purposes of the guidance is to create "national consistency in assessing the vapor intrusion pathway."[34] In doing so, however, EPA did not set specific numeric action levels but instead required a multiple-lines-of-evidence approach. The guidance aims to "provide a flexible science-based approach to assessment that accommodates the different circumstances (e.g., stage of the cleanup process) at a site and differences among pertinent EPA programs."[35] But because the guidance did not set specific limits, EPA's approach created further uncertainty regarding the action levels that will be used at particular sites. EPA stated that the guidance is to be used by EPA when considering CERCLA or RCRA corrective action, by EPA's brownfield grantees, and by state agencies acting pursuant to CERCLA or RCRA.[36]

Although EPA stated that the guidance is "not intended to alter existing requirements, guidance or practices . . . about circumstances for reviewing past risk management and cleanup decisions" or "modify existing guidance regarding landowner liability protection (e.g., all appropriate inquiries, the bona fide prospective purchaser provision)," the guidance will as a practical matter undoubtedly play a major role in the future of most cleanup sites where TCE levels are of potential concern.[37]

Importantly, the EPA 2015 Guidance does not impose (or discuss) the Region 9 Superfund Framework requiring remediation action in instances where the mean indoor air concentration of TCE measured over a 24-hour period exceeds 2 µg per cubic meter (µg/m^3). Instead, the need for action is based on chronic exposure rather than acute exposure. In this respect, the Region 9 Superfund Framework appears out of step with the EPA 2015 Guidance.

Also of note, the EPA 2015 Guidance does not establish any specific Trigger Levels for vapor intrusion investigation based on levels of TCE found in groundwater. In this respect, it differs from the SF RWQCB South Bay Directives, the SF RWQCB Interim Framework, and the 2013 Region 9 South Bay Letter.

Finally, EPA recommended against using the Occupational Safety and Health Administration's permissible exposure levels ("OSHA PELs") as a basis for evaluating the significance of vapor intrusion.[38] Although the EPA 2015 Guidance does not address the decision not to rely on OSHA PELs in detail, the guidance does note that the OSHA PELs are not intended to protect the most sensitive workers, may not rely on the most up-to-date toxicological information, and "may differ from EPA derivations of toxicity values with respect to weight-of-evidence considerations and use of uncertainty factors."[39] However sound its rationale, EPA's decision to employ an approach that directly conflicts with current OSHA PELs highlights the double standards that can arise when EPA and OSHA regulatory authority overlap.

As indicated by the foregoing, due to the differing approaches of federal and state agencies, the question of when TCE in groundwater will trigger indoor air testing requirements remains a highly unsettled and fact-specific area of law.

D. Case Study: The Triple Site

A few months before the SF RWCQB Interim Framework was issued, regulatory oversight for the facility known as the "Triple Site," which is one of the South Bay Superfund Sites, was transferred from the SF RWQCB to EPA Region 9, which thereby became the lead agency.[40] Within a few days, EPA Region 9 issued a notice of deficiency regarding a previously-submitted vapor intrusion work plan.[41] Soon after, EPA Region 9 and Phillips Semiconductor entered into an administrative order on consent which required testing at all sites overlying 5 µg/L TCE in groundwater (the "Triple Site AOC").[42] The Triple Site AOC states that "EPA has taken the lead oversight for the Triple Site because EPA believes there is a sensitive population potentially at risk from vapor intrusion."[43] The area to be sampled for potential vapor intrusion included "over 100 homes, an infant daycare and preschool, two elementary schools and one high school."[44]

According to an EPA fact sheet issued in April of 2016, the Triple Site vapor intrusion study area now includes over 400 homes, 130 of which had been sampled as of April of 2016, and 34 school buildings.[45] Many buildings showed no evidence of vapor intrusion, but EPA concluded that others did.[46] At those locations, mitigation systems are reportedly being designed.[47] Based on the test results, EPA has further expanded the study area to include a "step out" area including more residences.[48]

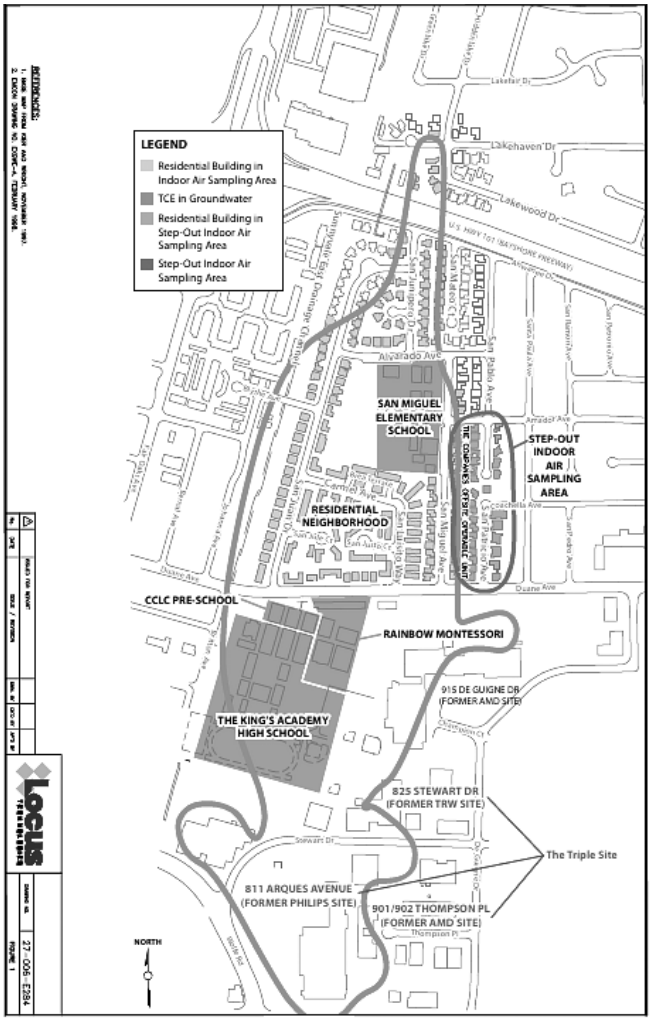

Figure 2: Map of three sites under Superfund, collectively known as the "Triple Site," in Sunnyvale, CA. *Graphic courtesy of U.S. EPA.*

EPA also has used the 5 µg/L TCE action level in groundwater to define vapor intrusion study areas at other sites in the South Bay where it is the active lead agency. Such investigations may, like the investigations at the Triple Site, involve potentially hundreds of residential and commercial structures.[49] Generally, EPA—rather than the responsible party—conducts neighborhood outreach and negotiates access arrangements in cases involving sampling of existing residential neighborhoods. Therefore, regulatory oversight costs may increase significantly after vapor intrusion concerns are identified.

Although EPA's actions should be closely monitored by legal practitioners, EPA is currently the lead agency in California at only a handful of TCE-contaminated sites. As a result, the actions of the various Regional Water Quality Control Boards and DTSC will have a much wider impact because their oversight extends to thousands of potentially affected sites.

III. RAMIFICATIONS FOR CURRENT AND CLOSED SITES

As a result of the developments discussed above, PRPs at any federal or state site involving TCE contamination in California now face a risk that previously selected remedies may need to be re-evaluated to assess the risk posed by TCE vapor intrusion. This applies to closed sites as well as sites in the operation and maintenance phase that did not previously involve a vapor intrusion remedy or which involved a vapor intrusion remedy based on less stringent standards.

For example, the SF RWQCB Interim Framework states that the SF RWQCB may re-open a site "if contamination remains at a property at concentrations that are no longer protective due to the new toxicity criteria."[50] This provision would appear to apply primarily to two types of sites under the jurisdiction of the SF RWQCB: (i) those with TCE in groundwater or soil gas at levels previously acceptable to the regulatory authorities but which now exceed applicable Trigger Levels; and (ii) those where TCE levels in indoor air may exceed the current RAL. These types of sites may be at significant risk of being re-opened for further assessment and potential remediation or mitigation.

Sites under EPA's jurisdiction are also at risk of being potentially re-opened due to vapor intrusion concerns. EPA has issued guidance for assessing the protectiveness of Superfund site remedies with respect to risks posed by vapor intrusion during the five-year review process.[51] This guidance envisions employing the five-year review process in scenarios where the remedy at a site was designed to address vapor intrusion, as well as when vapor intrusion was not considered at the time a site remedy was selected but new information has since become available that suggests that vapor intrusion has become a potential pathway of concern.[52] In the former case, the five-year review process would be used to ensure that the vapor intrusion remedy is operating as intended and is still protective of human health.[53] In the latter case, the five-year review process presents an "opportunity to identify issues, review data, makes recommendations, and develop a protectiveness determination for vapor intrusion."[54]

Furthermore, the standard re-opener provisions in consent decrees governing the cleanup of Superfund sites generally allow for sites to be re-opened when (i) "conditions at the Site, previously unknown to EPA, are discovered," or (ii) "information, previously unknown to EPA, is received [and] EPA determines that these previously unknown conditions or this information together with other relevant information indicate that the [Remedial Action] is not protective of human health or the environment."[55] These pro-

visions allow for the re-opening of a Superfund site both before and after EPA has issued a Certification of Remedial Action Completion for a site.[56] The establishment of the TCE Reference Concentration, for example, may constitute new information allowing EPA to impose new vapor intrusion requirements during a five-year review or pursuant to the terms of a previously executed consent decree.

IV. VAPOR INTRUSION MITIGATION AND CONTROL

Where vapor intrusion is a concern, there are various options for mitigating the potential for adverse health effects. The predominant forms of vapor mitigation include sub-slab depressurization systems and sub-slab venting.[57] New buildings also may use construction designs that will lower the potential for vapor intrusion. For example, plastic or equivalent geomembranes may be installed as liners beneath slab-on-grade foundations or podium-style construction may include an air gap that separates building foundations from soil.[58] When effective at meeting regulatory action levels, passive building systems (*i.e.*, subslab venting systems with no electrical fans) are preferred by SF RWQCB because they require less maintenance and are therefore considered more reliable. Subslab liners used alone—meaning passive membranes or vapor barriers—are disfavored due to the likelihood of punctures, perforations and incomplete seals.[59]

V. PRACTICAL CONSIDERATIONS FOR ATTORNEYS

For practitioners, the new regulatory agency initiatives present various issues of concern.

First, it is important to note that many of the recent policies issued by the various agencies are in the nature of guidance, not regulation, and are designed to be applied in a site-specific manner. Therefore, these policies may be subject to widely varying interpretations by regulatory agencies, and by specific personnel within those agencies. In that regard, prior to complying with agency requests for vapor intrusion-related TCE investigations or remediation, especially where they appear to go beyond actions that would have been required in the past or are inconsistent with the likely risks posed by specific site conditions, attorneys should consider challenging or otherwise questioning such requests. Given the newness of the scientific data and the lack of agency experience with respect to implementation of the new guidance, attorneys may wish to consider developing alternative requirements or challenging agency requests through either informal negotiation or more formal legal challenges.

Second, the new policies may tend to favor early action, such as the installation of vapor intrusion systems in buildings immediately without waiting for the results of months or even years of sampling data to confirm potential concerns. In this regard, under various regulatory programs, PRPs may undertake voluntary action to address issues proactively. Practitioners should be wary, however, of advising PRPs to take action without regulatory approval. Because standards for investigation and response action in this area continue to evolve and are highly site-specific, it is difficult to predict exactly what will satisfy governmental agencies.

Moreover, voluntary actions should be approached with particular caution in situations that may be covered by insurance or where there may be third-party contractual indemnities or legal claims against other PRPs. Under many insurance policies covering environmental contamination, insurers may deny claims for work that is not performed pursuant to a specific agency requirement. (Certain insurers also routinely include exclusions under Pollution Legal Liability policies for indoor air investigation and mitigation.) On the contractual side, an indemnity may limit indemnified claims to actions "required" under environmental laws or contain other restrictions on permitted response actions. When action is undertaken in the absence of an agency demand, these provisions may be used by indemnitors to claim that related costs fall outside the scope of the indemnity.

Third, vapor intrusion investigations and mitigation may be more disruptive or otherwise troubling to affected third parties than traditional soil or groundwater investigations and remediation work. Because vapor intrusion investigation and remediation will involve indoor work and living spaces, the practitioner must also consider concerns about personal exposure risk to, and potential legal claims by, those working and living in the affected buildings.

Fourth, vapor intrusion mitigation systems installed in or beneath buildings may require operation and maintenance for many years or, as a practical matter at certain sites, indefinitely. Therefore, when negotiating in regard to the installation of a vapor intrusion system, or contemplating the sale of a property owned by a PRP at which vapor intrusion systems are present or may become present, consider contractual provisions to ensure future access. Be mindful of addressing the question of who will bear the costs of operating and maintaining the system in the future and of installing new vapor intrusion systems if existing buildings undergo significant modification or additional buildings are constructed. In some cases, these issues may be addressed in agency-approved deed restrictions and other institutional controls.

Fifth, if you are assisting a client with a property transfer who is not likely to be considered a responsible party, consider approaching the lead agency about negotiating a prospective purchaser agreement or other written acknowledgement that may offer the new owner conditioned protection from future liability. For example, at certain of the South Bay sites, EPA has issued "reasonable steps" letters to prospective purchasers who are willing to allow continuing access to properties in connection with remedial efforts and who agree to take "reasonable steps" to stop or limit past releases and prevent future releases. Protections from future liability may also be available under state law, such as pursuant to the California Land Reuse and Revitalization Act.

In summary, the cumulative impact of the various agency guidance and directives addressed in this article remains unclear and practitioners in this area would be well advised to keep informed as to future legal developments and to consider creative approaches with respect to responding to agency requests in this evolving area of environmental law.

ENDNOTES

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1. EPA, National Center for Environmental Assessment, *Toxicological Review of Trichloroethylene in Support of the Integrated Risk Information System* (2011), *available at* https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=199.
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8. *See* Letter from Halogenated Solvents Industry Alliance to Information Quality Guidelines Staff, EPA (Nov. 5, 2013).
9. *See* Letter from Ann Dunkin, Chief Information Officer, EPA to Faye Graul, Executive Director, Halogenated Solvents Industry Alliance (Feb. 26, 2016).
10. *See* Memorandum from Enrique Manzanilla, Superfund Division Director, EPA Region 9, to EPA Region 9 Superfund Division Staff and Management, re: EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion (Jul. 9, 2014).
11. *See* Letter from Kathleen Salyer, Ass't Director Superfund Division, EPA Region 9 to Stephen Hill, Toxic Cleanup Division Chief, SF RWQCB (Dec. 3, 2013). The nine sites are: (1) AMD 901/902 TRW Microwave/Phillips and Offsite Operable Unit Combined Sites in Sunnyvale; (2) AMD 915 DeGuigne Drive Site in Sunnyvale; (3) Monolithic Memories Site in Sunnyvale; (4) Fairchild Semiconductor Site in South San Jose; (5) Hewlett Packard 620-640 Page Mill Road Site in Palo Alto; (6) Intersil/Siemens Site in Cupertino and Sunnyvale; (7) National Semiconductor Site in Sunnyvale; (8)

Synertek Building 1 Site in Santa Clara; and (9) Teledyne/Spectra-Physics Site in Mountain View. *Id.*

12. *See* United States Navy, *Vapor Intrusion: Where Are We Today?* 122 (2013), 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.

13. *See* Memorandum from Joyce C. Kelly, Director, Office of Environmental Assessment, EPA Region 10, to Rick Albright, Director, Office of Environmental Cleanup, EPA Region 10, re: OEA Recommendations Regarding Trichloroethylene Toxicity in Human Health Risk Assessments (Dec. 13, 2012).

14. Memorandum from Robin H. Richardson, Acting Director, Office of Superfund Remediation and Technology Innovation to Superfund Division Directors, EPA Regions 1 – 10, re: Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment (Aug. 27, 2014).

15. *See* Indiana Department of Environmental Management, *Clarification Regarding Application of Trichloroethene Indoor Air Screening Levels* (Mar. 7, 2016), *available at* http://www.in.gov/ifa/files/2016_SL_Table_with_TCE_Announcement(1).pdf.

16. *See* Pet'r Advanced Micro Devices Pet. for Review of a Letter Directive (June 12, 2014), Exhibit A, *available at* http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/petitions/a2312petition.pdf [hereinafter AMD Petition].

17. *See* AMD Petition at 3; Pet'rs Hewlett Packard Company and Varian Medical Systems Petition for Review and Request for Hearing (Feb. 24. 2014) at 6, *available at* http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/petitions/a2293petitionpart1.pdf [hereinafter HP Petition].

18. *See* HP Petition at 6.

19. *See* AMD Petition at 3.

20. *Id.*

21. *See* San Francisco Bay Regional Water Quality Control Board, *Draft Interim Framework for Assessment of Vapor Intrusion at TCE-Contaminated Sites in the San Francisco Bay Region* (Oct. 16, 2014), *available at* http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/sitecleanup/TCE_Interim_VI_Framework.pdf. Note that the reach of this document extends to all sites under the oversight of the SF RWQCB, and thus, its application is much broader than the South Bay Superfund Sites.

22. *Id.* at 5.

23. *Id.* Attach. A at 2.

24. *Id.*

25. *Id.* at 19.

26. *Id.*

27. Stephen Hill, SF RWQCB, Presentation at 2014 Environmental Law Conference at Yosemite, *Vapor Intrusion: Coming to a Property Near You: Water Board Approach and Perspective* (Oct. 18, 2014) at 9.

28. *Id.*

29. Information in chart supplied by SF RWQCB on August 10, 2016.

30. California Department of Toxic Substances Control Human and Ecological Risk Office, *Human Health Risk Assessment Note Number 5* (Aug. 23, 2014) at 2.

31. *Id.* at 3.

32. *Id.* at 2.

33. *Id.* at 3-4.

34. EPA 2015 Guidance at 5.

35. *Id.*

36. *Id.*

37. *Id.* at 8-9.

38. *Id.* at 128-29.

39. *Id.* at 128.

40. Letter from John Lyons, EPA Region 9, to Advanced Micro Devices, Inc. et. al. regarding Notice of Lead Agency Transfer- California Regional Board to US EPA (Aug. 7, 2014); Letter from Enrique Manzanilla, EPA Region 9, to Bruce Wolfe, SF RWQCB regarding Proposed Case Transfer (August 7, 2014); Letter from Bruce Wolfe, SF RWQCB to Enrique Manzanilla, EPA Region 9 regarding Recommended Case Transfer (Aug. 7, 2014).

41. Letter from Melanie Morash, EPA Region 9, to Advanced Micro Devices et. al. re Notice of Deficiency (Aug. 11, 2014).

42. Administrative Settlement Agreement And Order On Consent For Evaluation Of Vapor Intrusion To Indoor Air And Conditional Evaluation And Implementation Of Mitigation Measures At The Offsite Operable Unit, Triple Site Superfund Site

between EPA Region 9 and Phillips Semiconductor, Inc. (Mar. 4, 2015).

43. *Id.* at 6.

44. *Id.*

45. EPA, Region 9 Fact Sheet on Triple Site, "Expansion of EPA's Testing Area, Community Indoor Update" (April 2016).

46. *Id.* at 1.

47. *Id.*

48. *Id.* at 2.

49. *See, e.g.,* EPA Neighborhood Meeting Presentation Slides for Middlefield-Ellis-Whisman (MEW) Superfund Site Area & Vicinity (Nov. 1, 2015), available at https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/59ab6bb6c516689588257f00007399e4/$FILE/75403074.pdf/EPA%20Overview%20-%20Neighborhood%20Meeting%20-%20MEW%20Area%20-%20Nov%201,%202015.pdf.

50. *See* SF RWQCB Interim Framework at 22.

51. *See* EPA, Office of Solid Waste and Emergency Response, OSWER Pub. 9200.2-84, *Assessing Protectiveness at Sites for Vapor Intrusion. Supplement to the Comprehensive Five-Year Review Guidance* (2012).

52. *Id.* at 2-3.

53. *Id.*

54. *Id.* at 2.

55. *See, e.g.*, EPA, Model Remedial Design/Remedial Action Consent Decree ¶¶ 77-78, *available at* https://cfpub.epa.gov/compliance/models/view.cfm?model_ID=81.

56. *Id.*

57. *See* SF RWQCB Interim Framework at 22-25; DTSC/Cal EPA, *Vapor Intrusion Mitigation Advisory, Final, Revision 1* (2011); EPA, Office of Solid Waste and Emergency Response, EPA 542-R-08-001, *Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment* (2008); EPA, Office of Research and Development, National Risk Management Research Laboratory, *Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches* (2007).

58. *See* SF RWQCB Interim Framework at 22-25.

59. *Id.*