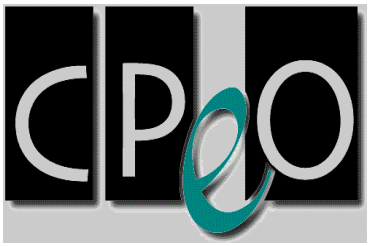

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EPA Superfund Docket
Attn: Docket ID No. EPA-HQ-SFUND-2010-1086

Dear Sirs/Mmes:

I am writing to support EPA's proposal to add the vapor intrusion pathway as a component of the Hazard Ranking System for listing properties on the "Superfund" National Priorities List (NPL). Recognition of vapor intrusion as a full migration pathway is long overdue, and it will make it easier to ensure that serious vapor intrusion sites are fully addressed in a timely fashion. Under the current HRS, many sites where significant numbers of people are presently exposed or may become exposed to toxic vapors at unacceptable levels escape the Superfund net. While the science for screening for vapor intrusion is constantly evolving, our understanding of the factors influencing exposure is sufficiently mature to avoid further delay.

There are five principal reasons for including the vapor intrusion pathway in Superfund evaluations:

1. First and foremost, where vapor intrusion is occurring, occupants of impacted structures may be exposed continuously to highly toxic volatile organic compounds (VOCs). Unlike drinking water exposures, vapor intrusion is a pathway that usually cannot be immediately turned off.

2. Many states lack the capability to conduct vapor intrusion responses. Arizona, for example, was unwilling or unable to investigate vapor intrusion at the Motorola 52nd Street Site. Fortunately, because this is actually an NPL site that was under state lead, EPA was able to finally initiate its own project. Even New York State, which arguably has the most proactive vapor intrusion program in the country, is unable to undertake vapor intrusion responses at locations with no identifiable source to place on its Inactive Hazardous Waste Site list. Such seems to be the case with the Speonk groundwater plume on Long Island. New York appears

reluctant to hold property owners, such as the owners of the former factory at 2350 Fifth Avenue, in Harlem, responsible for off-site vapor intrusion investigations.

3. Vapor intrusion sites that are not on the NPL are sometimes subject to unprotective indoor air action levels. The state of Nevada, for example, relies on EPA's Regional Risk Screening Levels for PCE, but its (excess lifetime) cancer-risk goal is one in 10,000, not the more appropriate one-in-a-million used in neighboring California. Similarly, EPA's Emergency Response program, which still includes the investigation at the CTS Asheville site in North Carolina (recently proposed for the NPL), is also limited to a one-in-10,000 cancer risk standard. Furthermore, New York State's protective approach to TCE does not apply to PCE, because state standards are still based on old findings that did not recognize PCE's carcinogenicity.

4. Inclusion of major vapor intrusion sites will make it easier to move beyond mere mitigation (such as sub-slab depressurization), which should be considered a temporary measure. On the NPL, vapor intrusion sites will be subject to strategies for permanent remediation of the soil and/or groundwater that serve as the source of the offending vapors. For example, at the MEW Superfund Study Area here in Mountain View, EPA's Second Five-year Review recommended accelerated remediation because of the continuing potential for vapor intrusion. The authorities associated with listing will also make it easier to continue operations and maintenance, monitoring, and public notification for the life of the contamination. There are also many sites, such as Carver Day Care Center, Evansville, Indiana, where vapor intrusion is recognized—as evidenced by evacuation and closure—but plume delineation has not yet occurred. The listing process should help such investigations to move forward

5. EPA's inability to conduct vapor intrusion investigations at sites where there is no other pathway means that large numbers of people in major cities such as New York, Philadelphia, and San Francisco are likely to be unacceptably exposed to highly toxic vapors from unidentified VOC groundwater plumes. These "rogue" plumes, often detected by accident, are usually unrecognized because local aquifers are not used for drinking water. **Therefore, there should be a mechanism for addressing densely populated urban areas with a large number of unknown sources through the Superfund program, because of the magnitude of the risk.**

As with other pathways, not all vapor intrusion sites merit inclusion on the NPL. As with the groundwater pathway, the scoring of vapor intrusion sites should consider the magnitude of the source and the number of potential receptors**. I suggest, in addition, that there be a "bonus" score for structures with essentially involuntary occupancy, such as schools, hospitals, and detention facilities. Even workplaces where those exposed have no say in approving or rejecting mitigation may deserve bonus scoring.**

The root-mean-square algorithm for combining pathways into a single score seems like an appropriate method of allowing either a single pathway or a combination of pathways to qualify a site for the NPL, but as the number of pathways increases, I suggest that EPA conduct sensitivity analysis to ensure that sites that have qualified in the past retain their scores, as well as ensuring that vapor-intrusion-only sites not be kept from qualification by the absence of other pathways.

Furthermore, it should also be recognized that not all sites that score high enough for listing are likely to be placed on the NPL. If already being addressed satisfactorily under other EPA or state programs, then listing may be deferred. In such cases, the existence of a qualifying score serves to remind all parties that listing could occur if the existing programs become ineffective.

While the Summa canister with laboratory analysis is the "tried and true" technology for sampling indoor and subsurface vaporsk, new technologies are emerging, including passive samplers and real-time/near-real-time sensors. **Therefore, the HRS should allow flexibility in sampling technologies and strategies. However, sampling should include "worst-case" events, in which buildings are sealed and unventilated.** Otherwise, results could simply show ambient concentrations. I remember visiting a home in Tallevast, Florida where residents said their home was sampled with the windows open. Under such conditions, it's unlikely that vapor intrusion would ever be detected. Of course, sampling may also include non-worst case scenarios in addition to worst-case. I analyzed data from Information Technology High School, in Long Island City (Queens, New York), which was sampled with the ventilation system on and with it off. The data showed elevated levels of PCE inside, but it also convinced me that the source was outdoor air, not the contaminated subsurface. Worst-case sampling should also consider climate. While the heating season is generally indicated in the Midwest and Northeast, other times of year may be appropriate elsewhere.

In most cases, the driver for action—and thus listing—should be exceedances of the 10^{-6} excess lifetime cancer risk exposure standard for the contaminant or contaminants of concern. It is reasonable to set a higher threshold for occupational scenarios than residential scenarios, but it is not appropriate to "risk away" the exposure by assuming that the receptors will only be exposed for a limited number of weeks, months, or years, because unfortunately in our modern society even those who move away may be exposed to the same or similar contaminants in the future.

EPA's listing strategy should not be dependent upon existing proof that people are being exposed to unacceptable VOC concentrations in their indoor air, because such data has rarely been compiled. Instead, it should accommodate three scenarios:

1. <u>At sites where data has already been collected for the purpose of evaluating the vapor intrusion pathway</u>. At such locations, where soil gas and indoor air concentration data is already available, screening should consider both established and potential vapor intrusion. I recommend a matrix similar to those used by New York State to determine actions at vapor intrusion sites. Instead of taking action based upon a single number, New York has tables in which the rows represent subslab soil gas concentrations and the columns represent indoor air concentrations. Either a high level of the contamination in the soil gas (indicating potential exposures) or a high level in indoor air (indicating confirmed exposures) can trigger a response, or a combination of moderate levels in both media can trigger a response. Similarly, the HRS score could be boosted by high VOC concentrations in soil gas, high VOC concentrations in indoor air, or moderate concentrations in both.

2. At sites with confirmed groundwater contamination. The Hazard Ranking System should also recognize that any VOC plume in the shallow-most aquifer has the potential for vapor migration into overlying or nearby structures. (Any information about potential preferential horizontal soil gas pathways, such as utility trenches, should also be used to identify potentially impacted buildings.) Though groundwater concentrations are an imperfect quantitative predictor of indoor air concentrations, groundwater concentration data is the information that is usually collected first at a site. For each contaminant of concern, there should be a *default* shallow-most aquifer groundwater concentration that is used to determine the number of potentially impacted buildings and receptors. It should be based upon existing knowledge of attenuation factors as well as current exposure standards. This screening concentration should be based upon 95th percentile exposures, not the average.

In my evaluation of sites with TCE and PCE in shallow groundwater, I currently use 50 parts per billion as a starting point, recognizing that site-specific conditions, including the hydrogeology and the condition of overlying structures (considering factors such as wet basements, dirt basements, gaps between slabs and walls, and degraded slabs), may cause adjustments. EPA should be able to develop more precise, robust screening values. Furthermore, the likelihood of groundwater plume migration should be considered when delineating the area, on the surface, that might be impacted.

When relying upon groundwater data, it should be rccognized that the density of groundwater monitoring locations may not be high enough to accurately define the area, on the surface, potentially impacted by vapor intrusion. Thus, it may be necessary to take additional groundwater samples to determine, using groundwater screening levels, which structures and receptors are potentially impacted.

3. In urban areas with "rogue" plumes, unmapped plumes generally of unknown origin. In areas where groundwater investigations have not been conducted, EPA should collect Phase One, Phase Two, and other investigation reports to determine how widespread VOC groundwater plumes are. In the absence of Superfund listing, it is unlikely that the vapor intrusion risk in many urban areas that import their drinking water will ever be thoroughly investigated or addressed. In some of these areas, it is possible that the Superfund response—as developed using the nine criteria of the National Contingency Plan—may rely primarily upon engineering and institutional controls, as opposed to full source remediation.

Evidence is emerging that vapor intrusion is a completed pathway throughout the country, from large volatile organic compound plumes emanating from industrial or military sources to "neighborhood" contamination from dry-cleaning and automotive service facilities. It is essential that EPA have the full suite of response tools, including Superfund Remedial Action, available to deal with largest and most serious of these sites.

Sincerely,

Lenny Siegel
Executive Director