

## The Environmental Corner

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### Vapor Intrusion; Who's DEFAULT is it?

As most drycleaners know, at some time in the not too distant future, you or someone you know will have to deal with the accidental release of perchloroethylene (Perc) or Stoddard solvent. Even if the release is decades old and unknown to the current owner/operator, soil and/or groundwater contamination may come to light during a property transaction, a refinance or through the course of standard due diligence investigations. This finding commonly results in a demand by the state environmental regulatory agency to determine the extent of the contamination and if necessary, remediate the contamination.

Environmental regulatory agencies often prioritize contaminated sites based on whether or not people may come into contact with, or be exposed to toxic chemicals. The three primary ways (or pathways) that people can come into contact with these chemicals is by getting contaminated soil or groundwater on their skin, eating and ingesting contaminated soil or groundwater,

or by inhaling the chemicals that volatilize from the contaminated soil or groundwater. If it is determined that one of these potential exposure pathways is complete, it becomes a priority to abate the exposure immediately, even before the extent of the impacts have been fully defined.

While it certainly makes sense to stop ongoing exposures to hazardous chemicals, some potential exposure pathways take more time, effort and money to evaluate than others. For example, the distribution and movement of contaminants in groundwater

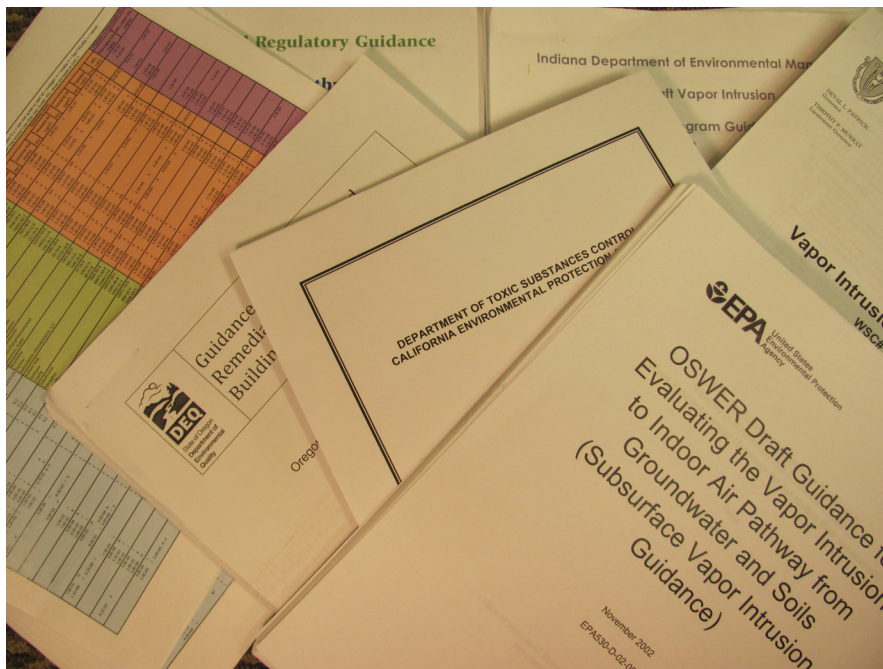
have been researched and studied for many years. Regulatory guidance documents are pretty consistent in their recommended investigation and assessment approaches. It is fairly standard practice to predict the area near a cleanup site where people drinking the groundwater would be at risk. If there is a well pumping groundwater for human consumption in the impacted area, someone is probably being exposed. Groundwater usage can be halted quickly and an alternative water supply can be installed or provided. This assessment can usually be conducted during the standard course of subsurface

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*As Seen In...*

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investigation activities without great delay to the overall project.

It is much more difficult to assess who may be breathing impacted vapors emanating from subsurface impacts. Vapors from subsurface releases of hazardous chemicals, such as Perc, can migrate through soil and bedrock and make their way into occupied structures, which is known as Vapor Intrusion or VI. Perc is a very volatile chemical, which is one of the properties that make it a good solvent for drycleaning.

As everyone should know by now, the assessment of VI issues is on the regulatory agency's mind at nearly every drycleaner site where soil or groundwater contamination has been identified. In fact, their top priority is to eliminate ongoing exposures. The difficulty is that there is not a consensus among regulators across the country of exactly how to investigate the VI exposure pathway and where it needs to be investigated. That is to say that there is not a consistent approach that can be applied by dry cleaners and their consultants who

are assessing VI.

The initial studies of VI at regulated environmental cleanup sites go back as far as 1989. Nearly a decade later the New Jersey Department of Environmental Protection issued some of the first guidance to assist with the investigation of VI. It wasn't until 2002, however, that the U.S. EPA issued subsurface VI guidance methods that could be applied at environmental cleanup sites across the country. Up through 2004, only a handful of states had released VI guidance documents and these were based largely on the 2002 U.S. EPA VI Guidance. Most of these guidance documents were considered draft in nature. At present there are over 30 individual states with their own VI guidance documents (either draft or final), plus those developed by the U.S. Department of Energy and the individual branches of the military, among others.

Some of the VI investigation methods currently being enforced by state regulators are narrowly based on the 2002 U.S. EPA guidance, yet

some have been revised or were developed in later years when advances in the study of subsurface vapor migration, human toxicology and predictive screening approaches could be incorporated. Fortunately, there are many private and public research organizations studying all aspects of VI issues and their findings are constantly being incorporated into revised and re-issued guidance documents. In fact, it was announced in 2010 that the U.S. EPA is updating its own guidance document from 2002, but it is not expected to be released until late 2012.

So with all of these guidance documents available for use during the investigation process, anyone should be able to simply determine whether potential health risks exist to neighboring residences or renters. Not quite. Individual state agencies also recognize that the field of VI study is rapidly developing and that many existing guidance documents, perhaps even their own along with the EPA's, are becoming outdated. This has created a situation where the regulators are probably promoting or enforcing overly conservative methods during the assessment of VI issues. As a "Default" approach, it is not uncommon for regulators to consider every home, business or other occupied building within 100-feet of a significant groundwater plume of volatile contaminants (e.g. Perc) as a potential VI concern. The most conservative approach is to then collect indoor air samples and vapor samples just beneath the concrete floor (sub-slab samples) from the buildings and analyze them for Perc and other volatile organic chemicals.

In our experience with drycleaner sites and where they are located, this

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could include the need to enter and collect samples from a large number of buildings, houses and apartment complexes. While this broad, brush-stroke approach will definitely determine in which buildings VI may pose a true health risk; it may also expose the business and/or property owner to needless legal issues. Imagine your consultant knocking on your neighbor's door and asking him or her if you can put a stainless steel canister in their house because you need to collect indoor air samples that could be affecting their health. Not a pretty picture.

Another common Default method for investigating the potential for VI concerns includes a tiered approach where data from groundwater and soil gas is collected in successive steps to identify those buildings that may "screen out" of the assessment prior to actually approaching building owners and occupants to request the collection of indoor air samples. While this approach could help rule out buildings that require no further assessment, it is also complicated by the fact that the levels considered safe to breathe for some solvent constituents are under continual revision.

The evaluation of the VI exposure pathway is a complicated mixture of screening levels, attenuation factors, partition coefficients, preferential pathways and regulatory guidance. A good environmental consultant needs to be sophisticated enough to extract the appropriate information from the latest research and be able to present a strong argument to the regulatory agency whereby the VI assessment is appropriate, but not overblown and excessively conservative. Your

consultant should have the experience and knowledge to work with the regulators so that creative, but correct and effective investigation and screening methods, known as Non-Default methods, can be considered and implemented. Remember that guidance and regulation are based on scientific research and databases. As research advances are made and databases are updated, your consultant needs to be one step ahead of regulation.

***Stephen R. Henshaw, P.G. President & CEO - With over 20 years of experience, Mr. Henshaw holds professional geology registrations in numerous states. As President and CEO of EnviroForensics, Henshaw serves as a client and technical manager on projects associated with site characterization, remedial design, remedial implementation and operation, and litigation support and insurance coverage matters. He has acted as Project Manager or Client Manager on over 200 projects. These projects have included landfills, solvent and petroleum refineries, foundries, metal plating shops, food processors, wood treating facilities, chemical manufacturers and distributors, mines and quarries, heavy equipment manufacturers, computer manufacturers, and transporters. He has also served as a testifying expert on behalf of individual landowners and facility operators at several sites impacted by industrial activities and continues to provide technical and litigation support services. Contact him via e-mail: shenshaw@enviroforensics.com.***

***Jeff Carnahan is a Senior Project Manager and a Licensed Professional Geologist (LPG) with 13 years of environmental consulting and remediation experience. Carnahan's expertise has been developed during the investigation and interpretation of subsurface releases of hazardous substances and controlling risk and cost implications for his clients. While managing sites ranging in size from retail gas stations and dry cleaners to large integrated steel mills, Carnahan has extensive experience working with releases of chlorinated solvents within voluntary and enforcement cleanup programs for various State agencies and the U.S. EPA. Additionally, he has specialized experience in providing technical support to the legal community regarding the cause, origin, transport and potential cost of environmental releases. Carnahan has over 8 years experience relating to the investigation and mitigation of vapor intrusion issues and is leading the VI Assessment Team at EnviroForensics.***