

The Environmental Corner

By: Steve Henshaw



Vapor Intrusion Is On The Rise!

Last month the California Environmental Protection Agency (Cal/EPA) hosted two Vapor Intrusion Workshops. While we recognize that not all of the readers care about more strict California regulations being handed out, in the environmental world regulations and technology coming from California usually creeps across the country to other states like ivy on a tree. The workshops were held for Cal/EPA staff and other stakeholders, which were predominately environmental consultants. John Bird, Vice President of EnviroForensics, and one of the foremost leaders on vapor intrusion issues with over 12 years of hands on experience, was there to report on pending issues and new developments. Not so ironically, out of the seven projects that were presented by Cal/EPA during the workshops, two were projects that John served as lead scientist.

The workshop focused on the three Cal/EPA advisories and guidance's which either have been issued

or will be issued very soon. The first topic of discussion focused on proposed changes to a January 28, 2003 guidance document for the collection of subsurface vapor samples called "Advisory-Active Soil Gas Investigation". Without going into great detail, Cal/EPA recognizes that sampling protocols need to be more stringent and consistent. Current sampling approaches need to acknowledge that the vapor samples can be diluted by air entering from the top of a boring or drive point

device, resulting in sample dilution. Simply stated, fresh air can run along the side of a boring and enter the sample canister, mixing with the vapor sample thus resulting in a diluted sample (see figure below). So, Cal/EPA discussed proposed sampling changes to prevent sample dilution.

The new advisory, currently scheduled for release in August 2009, will deal with several technical issues like investigation flexibility us-

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ing Data Quality Objectives instead of prescriptive language. The Data Quality Objectives would include establishing site specific sample spacing, sample depth, the installation of permanent probes, detection limits for the samples and appropriate analytical methods. The new advisory will also address changes in leak check compounds and holding times for sample containers.

It's too early to tell what these changes will mean to the cost of the vapor sampling, since neither the laboratories nor the soil gas sampling contractors have had an opportunity to adjust their fees for adherence to the new advisory recommendations. Although the Cal/EPA was quick to point out that this new advisory is still just an advisory and not a requirement, we have never had a work plan or collected data approved in California that didn't follow their advisory and guidance document.

Cal/EPA is also revising the Department of Toxic Substance Control's (DTSC's) Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air from February 7, 2005. This new revision is not expected to be released until November 2009. The proposed changes include: Modifications to soil gas sampling to address specific factors for vapor intrusion, the need for installation of permanent monitoring probes, adjustment for using site specific sub slab attenuation factors and effective diffusion coefficients, and concerns with post remedial confirmation sampling of indoor air and soil gas.

And since the Advisory-Active Soil Gas Investigation are being rewritten to take into consideration the specific needs of a vapor intrusion study, the new guidelines will address the need for repeatable, specific, multiple depth soil gas samples

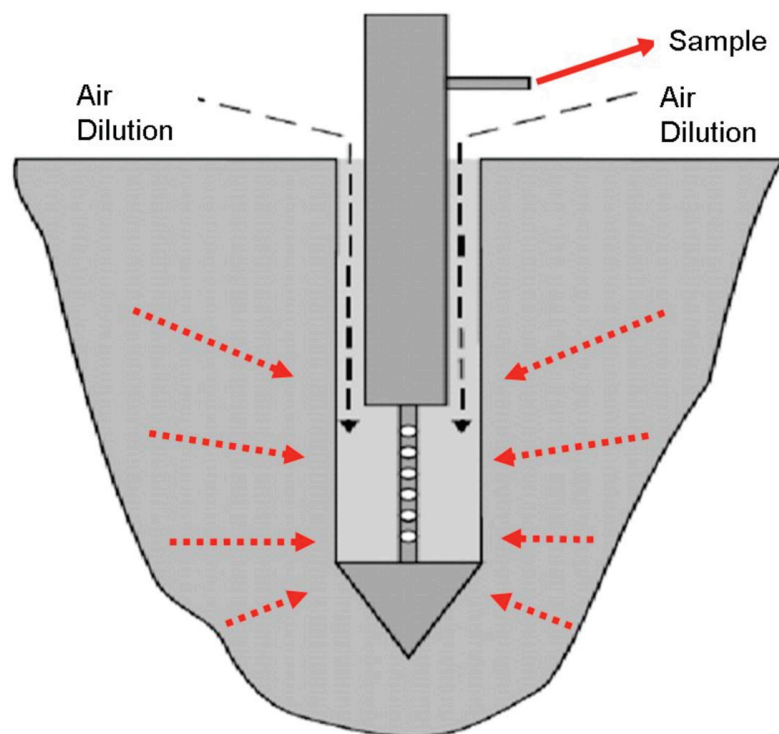
from the source areas at the site. This equates to having permanent monitoring points at many dry cleaning sites, much like the groundwater monitoring wells that you see around gas stations. The guidance will require a keener understanding of the site soils, and the physical parameters of the potential indoor air pathways. In the past guidance, a number of assumptions were used to estimate the potential exposure including a sub slab attenuation factor and the effective diffusion coefficients for site soils. The new guidance will want a thorough study of those factors during the soil gas investigation. These requested items alone are certain to significantly increase the cost of a vapor intrusion study in California in the very near future. .

The last document discussed is the DTSC's Vapor Intrusion Mitigation Advisory (VIMA). This document was originally issued in April 2009 and later revised and reissued on May 8, 2009. DTSC issued the VIMA for immediate use on sites

that may be impacted by soil vapor intrusion into indoor air. The mitigation alternatives described in the Advisory are response actions designed to interrupt or monitor the vapor intrusion pathway and ensure public safety until volatile chemical concentrations in soil, soil gas, and/or groundwater are confirmed to have been restored to concentrations at or below levels considered safe for human exposure. It's important to point out that the Cal/EPA does not consider the indoor air mitigation measures to be remediation of the contamination, just barriers to human exposure.

The VIMA addresses the following technical points: establishes a risk management framework for vapor intrusion mitigation decisions; describes various mitigation technologies; and provides detailed guidance for post-installation operation and maintenance of mitigation

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technologies. The risk management framework is not necessarily new. The framework is the same as the Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air. It uses part of the 11 step evaluation process discussed in the previous guidance document. The VIMA assumes that a completed pathway exists to a home or a business.

The VIMA's recommended mitigation alternatives include sub slab ventilation (SSV) and sub slab depressurization (SSD), but doesn't rule out other engineering alternatives like sub slab liners, building pressurization, or indoor air treatment. Their preferred alternative for existing buildings is SSD which requires the installation of a sub slab piping system and full time operating blower to induce a lower pressure below building floor by removing sub slab air, rather than by forcing air into a building, which ends up diluting the vapor concentrations inside the building. The Cal/EPA appears to want to use this system over the other engineering alternatives for existing buildings, even though building pressurization has been shown to be effective in reducing vapor concentrations at a significantly lower cost. The Cal/EPA instead tried to use extreme examples of building heating and cooling cost problems associated with building pressurization, which frankly we don't agree with.

These mitigation measures that the Cal/EPA has recommend have been used successfully in dealing with Radon gas across much of the country. The costs of mitigating Radon gas is borne by the homeowner and is considered part of living in an

area with the natural (radioactive) breakdown of uranium in soil, rock and water. So who pays the installation and long-term operations and maintenance of these systems if these systems are installed to take care of soil and groundwater contamination from an off-site source? This long term cost issue may be the elephant in the room, particularly for some large groundwater plumes that effect residential housing tracts. California has yet to implement any large scale

vapor mitigation controls for residential housing tracts, but that time is coming according to the Cal/EPA representatives. The VIMA document doesn't address the long-term costs associate with the mitigation and only time and legal battles will likely resolve the issue.

In the meantime, the Cal/EPA continues to take the lead in addressing the vapor intrusion issues and as such, the costs for complying with such requirements is sure to rise.

