Final Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion Executive Summary

Background

Toxic vapors can move from contaminated groundwater and soil to indoor air. This process is called vapor intrusion (VI). Vapors inside buildings can threaten human health. The science behind VI has been evolving quickly. To protect the health of the people living and working in California, the Department of Toxic Substances Control (DTSC) and the California State Water Resources Control Board (State Water Board), wrote a supplement to existing VI guidance. This document is called the *"Final Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion"* (Final Draft Supplemental VI Guidance). It is guidance and not regulation or a water quality control plan or policy and therefore is not intended to be binding. The Final Draft Supplemental VI Guidance presents an updated four-step approach that can be used to protect people from the dangers of VI.

At contaminated sites throughout the state, this approach can help determine:

- Which buildings to evaluate first
- How to screen buildings for VI
- Where and when to sample
- When to take additional steps

The Final Draft Supplemental VI Guidance also has information about:

- Following the U.S. Environmental Protection Agency (U.S. EPA) approach to screen buildings for VI based on underground vapor or groundwater contamination
- Using multiple lines of evidence to make decisions
- Considering special cases when vapors may move from sewers into indoor air
- Adding California-specific VI information to a publicly available database

This document is generally intended to add to, not replace, what is already in existing State guidance[1] to screen buildings near known or suspected spills or disposal of vapor-forming chemicals (VFCs). This guidance does not apply to leaking petroleum underground storage tanks (USTs) because USTs are governed under State Water Board's Low-Threat UST Case Closure Policy[2].

[1] DTSC 2011 Vapor Intrusion Guidance https://dtsc.ca.gov/wp-content/uploads/sites/31/2022/06/Final_VIG_Oct_2011_ada.pdf
San Francisco Bay Regional Water Quality Control Board 2014 Interim Framework
www.waterboards.ca.gov/rwqcb2/water_issues/programs/sitecleanup/TCE_Interim_VI_Framework.pdf

[2] State Water Board 2012 Low-Threat Underground Storage Tank Case Closure Policy
https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf

Four Steps to Evaluate Vapor Intrusion

The Final Draft Supplemental VI Guidance describes four steps that can be helpful to protect the health of people inside buildings from VI.

Step 1 – Decide which buildings should be tested first and how.

- When there are several buildings, use a "worse first" approach: start with those that are closest to the contamination and where people could already be exposed.
- If a building is above or very close to the spill, there are special cases that could allow toxic vapors to move from the sewer to the indoor air, or other likely health risk, it may be appropriate to skip Step 2 and go directly to Step 3.

Step 2 – Screen buildings from outside.

For each building, measure VFCs underground at these locations:

- Between the spill and the building
- Just outside the building
- From at least two depths at the same location(s)
- Consider if VFC concentrations may change with seasons

Step 3 – Test indoor air.

Measure VFCs in indoor air, beneath the building's foundation, and outdoor air at the same time:

- Test the air in three or more rooms, depending on the size of the building
- Test below the foundation near where the indoor air is tested to check if VFCs are coming from under the building
- Test the outdoor air to check if the VFCs are coming from outside
- Consider if results may change with seasons, and
- Test with the heater or air conditioner (on and off) to see if that changes the results

Use these test results to estimate if people are likely to be affected.

Step 4 – Act to protect people's health.

- To protect people living or working in the building, take action based on the amount of VFCs in the indoor air
- To protect people living or working in the building in the future, take action based on the amount of VFCs underground because the building characteristics can change over time
- When possible, the best response is to clean up the contamination (remediation)
- Use protective measures until the spill is cleaned up (mitigation)
- In extreme cases, occupants may need to be temporarily relocated

The overall cleanup should be designed when the contamination is fully understood and should consider the characteristics of each site.

Toxic Vapors May Move Through the Sewers under Certain Conditions

VFCs may enter sewer pipes that run through contaminated soil or groundwater. Once inside a sewer, vapors can move through the pipes and escape through cracks or openings, under or inside a building. If everything is working well, sewers are designed so that vapors and odors move away from buildings. However, if drains or the sewer are not working properly (e.g., dry P-trap; cracked pipe; loose joint), vapors can move from the sewers into the indoor air. Some of the traditional ways to test for VI could potentially miss VFCs moving through sewer pipes.

Vapor Intrusion Attenuation Factors

Attenuation factors are used to estimate how much of the vapors underground or in groundwater end up in the indoor air. The attenuation factors in the U.S. EPA guidance[3] may be used in California. These factors are based on a large study of buildings at contaminated sites throughout the United States, including several in California. These attenuation factors are commonly used nationwide.

California Vapor Intrusion Database

Data from sites evaluated using the approach described in the Final Draft Supplemental VI Guidance will be entered in a database that will be available to everybody. This data may be analyzed to learn how to better protect the people of California from VI.

Where to Find the Final Draft Supplemental Vapor Intrusion Guidance

Electronic copy of the Final Draft Supplemental VI Guidance is available at the following links:

State Water Resources Control Board Vapor Intrusion Website:
https://www.waterboards.ca.gov/water_issues/programs/site_cleanup_program/vapor_intrusion/

OR

Department of Toxic Substances Control Vapor Intrusion Website:

https://dtsc.ca.gov/vapor-intrusion/

[3] OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf