

GUIDANCE DOCUMENT

RECOMMENDATIONS REGARDING VAPOR INTRUSION RESPONSE IN OHIO

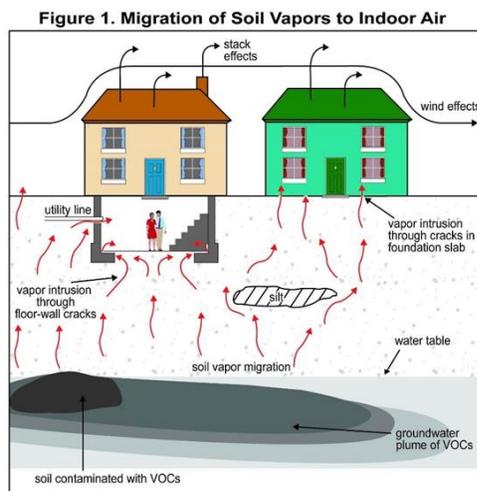
March 2020

Background and Purpose

Identifying, investigating, and completing necessary response actions for imminent hazards which pose an immediate risk to human health or the environment is a top priority for Ohio EPA. The purpose of this guidance is to provide a general framework for addressing imminent hazards which may result from the intrusion of chemical vapors from environmental contamination in soils and ground water into buildings. This document is intended to be a companion document which provides clarification on implementation of Ohio EPA's "Sample Collection and Evaluation of Vapor Intrusion to Indoor Air" (Ohio EPA 2020). These combined documents represent the Ohio EPA's position related to vapor intrusion and supersede any and all previous Ohio EPA vapor intrusion guidance documents or memorandums presented by the agency. This document does not have the force of law.

1.0 Introduction

Vapor intrusion (VI) is the movement of chemical vapors from contaminated soils and/or ground water into the indoor air of overlying or nearby buildings (Figure 1). The chemical vapors can enter buildings through cracks in basements and slab foundations or through



other openings such as sump pits, utility conduits and drains. Breathing contaminated vapors may pose an unacceptable risk to people in homes, workplaces, and businesses. The risk posed by VI may be chronic (risk resulting from a long exposure time, e.g., years or decades) or acute (risk resulting from short term exposure, e.g., days or weeks). Where the potential for adverse health effects or an imminent hazard exists from a short duration exposure, it is expected that the parties responsible for and/or investigating the contamination will proceed in a timely manner that is protective of human health.

2.0 Evaluation of Site Conditions

Ohio EPA recommends evaluating multiple lines of evidence in a systematic approach to investigate potential VI risk to receptors. Sampling strategy, development of a Conceptual Site Model (CSM), and evaluation of data for VI investigations should follow the guidance provided in “Sample Collection and Evaluation of Vapor Intrusion to Indoor Air” (Ohio EPA 2020). Generally, the most recent version of the U.S. EPA Vapor Intrusion Screening Level (VISL) calculator should be applied corresponding to an excess lifetime cancer risk of 1E-5 and a noncancer hazard quotient of 1. Consistent with the Comprehensive Environmental Response, Compensation, Liability Act (CERCLA), the Resource Conservation Recovery Act (RCRA) and State laws such as the Voluntary Action Program (VAP), it is expected that investigations continue until either environmental data support the conclusion that the VI pathway does not present an unacceptable risk or a remedy is implemented.

Having knowledge of the people living or working in a building aids in determining appropriate indoor air thresholds. Both U.S. EPA and Ohio EPA (e.g., VAP) have residential and nonresidential standards for the VI pathway. The standards are relatively consistent within State and Federal remediation programs. It should be noted that the Ohio VAP standards are promulgated in rules and may vary from U.S. EPA Screening Levels, those differences are relatively nominal with respect to remedy selection.

In workplace settings (commercial and industrial) Ohio EPA and the Occupational Safety and Health Administration (OSHA) jurisdictions may overlap. OSHA is the primary regulatory agency tasked with protecting workers while on the job. OSHA’s regulatory thresholds for workers are called Permissible Exposure Levels (PELs) and include standards for indoor air. OSHA recognizes that many of its PELs are outdated and inadequate for ensuring protection of worker health, since the PELs were initially promulgated in the 1970’s. To provide employers, workers, and other interested parties with a list of alternate occupational exposure limits that may serve to better protect workers, OSHA has annotated the existing Z-Tables with alternate occupational exposure limits although these are not regulatory limits for OSHA.

OSHA is the primary regulatory agency when contaminated media is not the source of the detections of chemicals in indoor air for commercial and industrial workplaces. Ohio EPA defers to OSHA indoor air regulatory thresholds for these properties. When chemicals of concern are used in the business (e.g., included in the OSHA Hazard Communication program with an expectation for employees to be made aware of the chemicals and associated risks), OSHA PELs will generally apply. However, changes in processes or OSHA’s jurisdiction must be considered for future exposure scenarios. Even when regulated by OSHA, it is recommended that businesses with VI impacts communicate the risks associated with VI to employees.

When indoor air contamination is solely derived from VI from environmental media in a commercial or industrial scenario, Ohio EPA standards will apply. When contaminated media is the source of the chemical vapors in a nonresidential building/workplace, U.S.

EPA “does not recommend using OSHA’s PELs for purposes of assessing human health posed to workers by the vapor intrusion pathway...arising in nonresidential buildings” (OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, 2015). Thus, Ohio EPA standards for VI are used at certain workplaces instead of OSHA PELs. When it is unclear whether the indoor air exceedance is derived from environmental media sources or business use, coordination with Ohio EPA may be required to determine the appropriate response and use of action levels.

3.0 Response Timeframes

The National Contingency Plan preamble (55 FR 8704) states “EPA expects to take early action at sites where appropriate...to eliminate, reduce, or control the hazards posed by a site.” As a policy, U.S. EPA considers possible early action at concentrations exceeding Regional Removal Management Levels (RMLs). Regarding RMLs, US EPA states: “Comparison of site concentrations to RMLs is only one factor used in determining the need for a removal action at a site. While EPA’s expectation is that removal actions are generally justifiable above the RML, EPA has the flexibility to determine that case specific conditions do not warrant a removal action” (<https://www.epa.gov/risk/regional-removal-management-levels-rmls-users-guide>). Similarly, Ohio EPA recognizes that concentrations of chemicals exceeding RMLs warrant early action to control hazards and will evaluate response actions and timeframes based on case-specific conditions. Vapor intrusion investigations, on or off-site, should be conducted at a timely pace. Sites with people that are more sensitive to harm from VI or with chemicals with acute/short-term potential health risks should be assessed with urgency. If a responsible party will not or cannot meet the necessary sampling objectives and/or timeframes, Ohio EPA may take a variety of actions to ensure receptors are protected, including but not limited to referral of the site to U.S. EPA or use of the Director’s statutory authority to conduct investigations or implement remedies.

If, at any time during site assessment and evaluation, the party investigating the site suspects that an imminent hazard may be present, the assessment process should be expedited to ensure protection of human health. Expedient assessment may include bypassing certain steps in a typical assessment process to more rapidly evaluate the VI pathway (i.e. moving directly to indoor air sampling or implementing an interim action). While prompt response is expected, timeframes for action vary due to site-specific factors including, but not limited to:

- contaminant concentration
- building construction
- off-site access arrangements
- receptor type and location
- preferential pathways
- presence of indoor sources

Professional judgment should be applied to these criteria in determining the timeframe appropriate to evaluate imminent hazards and/or implement remedial actions. While site-specific factors may impact action timeframes, as previously noted, it is expected that the

parties responsible for and/or investigating the contamination will proceed in a timely manner that is protective of human health.

4.0 Communication

Communication with Ohio EPA DERR is recommended for sites with current VI problems on or off-site and when a site does not contain buildings, but a potential future VI problem exists. Communication is especially important when off-site assessment and/or residential sampling is required. While Ohio EPA recognizes that property owners and/or building occupants may not be receptive to communication attempts, it is expected that responsible parties will make and document reasonable and frequent attempts to communicate with interested parties. Prior to conducting residential sampling, the person undertaking the VI investigation should consider how the potentially impacted community and local government should be notified. Proper community involvement efforts are critical to the effective implementation of sample collection, evaluation, and risk communication. Ohio EPA should be involved early in the risk communication planning process to ensure proper interagency notification and coordination with the U.S. EPA, Ohio Department of Health, and local health departments, as appropriate.

Early and frequent communication allows for responsible parties and agencies to collaborate on vapor intrusion sites and respond quickly to new information (e.g., new laboratory data, information from impacted residents, etc.). If residents are exposed above a regulatory standard, at a minimum, the Ohio Department of Health and the local health department should be engaged. Depending on site-specific regulatory authorities, the Ohio EPA, Ohio Department of Health, the local health department, or U.S. EPA may be the lead agency for coordinating communication to private citizens.

Coordination with
Ohio Department of Health.

ODH may be notified by phone at:(614)
728-9452 (business hours)
(614) 722-7221 (after hours)

It is imperative to keep potentially impacted individuals informed by providing information at each step of the process (e.g., sampling, laboratory result evaluation, and remedial action). Regardless of the results of sampling data (e.g. non-detect, below standards, or above standards) results, associated risk, and next step(s) should be immediately communicated to building occupants (residential and nonresidential). In order to ensure that results can be communicated in a timely manner, responsible parties should request contact information from building occupants and owners prior to sampling. Communication of results for off-site properties should be coordinated with State and local Agencies, to ensure that they have the same information as building occupants and are able to answer questions they may receive.

5.0 Mitigation Systems

Vapor intrusion mitigation systems may be installed at any time during the VI investigation process as a presumptive remedy, interim action, or long-term remedy. In addition to permanent mitigation systems, other alternative remedies are available to provide temporary protection for building occupants (e.g., air purifying units). The effectiveness

of any VI mitigation system or temporary remedy must be tested to make sure that it is providing protection to the building occupants. Permanent remedies or mitigation systems will need to reliably operate over many years to provide protection during timeframes for soil and ground water contamination to be remediated. One component of the testing is multiple rounds of confirmatory indoor air sampling to account for differences in atmospheric conditions.

Ohio EPA will work with responsible parties through orders, permits, and regulatory programs such as the VAP to develop requirements/obligations for operation and maintenance (O&M) of permanent mitigation systems. Provisions must also be made to ensure current and future property owners/occupants are aware of mitigation measures, so their integrity is not damaged by building renovations or repairs. It will be assumed that responsible parties will implement O&M as long as a VI threat persists.

In addition to mitigation, long term protectiveness often includes institutional controls to limit use and occupancy (i.e., commercial land use restriction). Institutional control restrictions must be recorded in an environmental covenant to ensure that future owners or occupants are aware of the restrictions required to protect future occupants.

Where there is no responsible party and a governmental agency (U.S. EPA or Ohio EPA) installs a mitigation system in residences or commercial structures, O&M responsibilities will be transferred to the current and future property owners. However, Ohio EPA will continue to be available to assist with resolving VI questions or concerns. It will be the responsibility of the current property owner to ensure that future property owners or occupants are informed of the environmental issues that lead to the installation of the mitigation system and the need for continued operation of the mitigation system.

6.0 Summary

Intrusion of chemicals from environmental contamination in soils and ground water (VI) can pose risks to current and future building occupants. Vapor intrusion sites where imminent hazards exist require active management and frequent communication to ensure site specific timeframes for responses are identified and met. While site-specific conditions are considered, the general requirements for responsible parties to evaluate and respond to imminent hazard situations includes, but may not be limited to: expedited assessments; rapid implementation of temporary remedial or permanent mitigation systems; communication with regulators, property owners and building occupants, both current and future; verification of remedial effectiveness for the short and long term; and, continued O&M of mitigation systems.