Public Outreach During Vapor Intrusion Mitigation

ITRC has developed a series of fact sheets that summarize the latest science, engineering, and technologies regarding vapor intrusion (VI) mitigation. This fact sheet describes:

- common concerns of communities affected by VI
- specific vapor intrusion considerations for development of a Community Engagement Plan
- references to support preparation of a Community Engagement Plan

1   INTRODUCTION

It is important to engage the public at environmental contamination sites, but at vapor intrusion sites it is *essential* to engage the people who own, live, work or study in, or otherwise occupy impacted buildings. Their cooperation, not just permission, makes it possible to investigate, remediate, mitigate, and monitor properties contaminated with hazardous substances. You may be asking them to agree to allow intrusive or disruptive activities such as drilling holes through their floors, attaching fans and piping to their buildings, or rearranging their basements for investigation or mitigation.

Before the first announcement or knock on a door, the environmental team should implement a Community Engagement Plan that recognizes the unique character of each community and the form of planned investigation or mitigation. While the contents and logistics of a Community Engagement Plan for a vapor intrusion issue are listed separately below, they are integrally related and will need to be developed together.

2   POSSIBLE COMMUNITY CONCERNS FOR THE COMMUNITY ENGAGEMENT PLAN

Characterizing the community and listening to affected parties to determine their concerns are the first steps in developing a Community Engagement Plan. Some common concerns are listed in Table 2-1. The initial characterization will help determine when, where, and how to communicate in the future with the affected parties.

Table 2-1. Common affected party concerns.						
Possible Concerns						
Occupant/Use	**Communication Language Barriers**	**Operational Impact**	**Property Value (increase or decrease)**	**Health and Safety**	**Cooperation/ Trust**	**Access/Privacy**
Residential						
Homeowner	X		X	X	X	X
Manager	X	X			X	X
Renter	X			X	X	X
Other Stakeholders (e.g., tribal communities)	X		X	X	X	X
Non-Residential						
Commercial/Industrial	X	X	X	X	X	X
Retail Tenants (incl. customers)	X	X		X	X	X
Hospital (incl. patients)	X	X		X	X	X
School/Daycare (incl. parents)	X	X		X	X	X
Place of Worship	X	X		X	X	X
Public Facilities	X	X		X	X	X
Note: X indicates common potential concerns affecting various categories of occupants.						

3   UNIQUE TOPICS FOR THE COMMUNITY ENGAGEMENT PLAN

Refer to the ITRC Risk Communication section within *Technical Resources for Addressing Environmental Releases of PFAS – Per- and Polyfluoroalkyl Substances* (https://pfas-1.itrcweb.org/14-risk-communication/)) for generic, but in-depth, guidance on developing a Community Engagement Plan. The risk communication section addresses general topics including Role of Risk Perception; Risk Communication Challenges; and Risk Communication Planning and Engagement Tools.

A Community Engagement Plan specific to vapor intrusion is discussed in detail within section 7.0 of the ITRC Petroleum Vapor Intrusion (PVI) Guidance (October 2014) (https://www.itrcweb.org/PetroleumVI-Guidance/). The community engagement section addresses topics including Stakeholder Concerns; Community Engagement Plans; and Risk Communication. The PVI Guidance includes a robust description of the topics discussed within this fact sheet. However, note that the risk from PVI, which is the focus of the PVI Guidance, is generally lower than the risk from other contaminants such as chlorinated solvents.

A Community Engagement Plan specific to vapor intrusion may need to address the following concerns:

3.1 **Vapor intrusion is a unique and complex topic with which the general public is unfamiliar.** When exceedances occur, affected individuals do not have control to reduce the level of contaminants in air, which can cause substantial anxiety. It is important to inform people that screening levels are established to protect the most sensitive populations, often for a long-term exposure. Communicating the difference between acute and chronic exposure and the difference between acute and chronic health effects is important and may need to be done by state and local health department staff who specialize in health risk communication**.** People should not assume exceedances above the screening levels will cause illness in all people**.** Still, those are the levels by which regulators make risk decisions. The inherent variability with vapor intrusion due to so many factors further complicates the topic but must also be communicated. The *terminology* to explain vapor intrusion and health risks is also complex and unfamiliar. It is critical to use everyday language to keep the audience engaged and informed.

An example of a plain language message for an occupant is: "*Odorless toxic chemical vapors can enter a building from the subsurface through cracks and other openings. Breathing the vapors at elevated levels is not healthy and can cause cancer and other diseases if breathed over a long time. Some chemical vapors can cause health issues for you after a short exposure.*"

> ### *Public Outreach Example*
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> *It is often possible to tailor investigation and mitigation strategies to maximize cooperation between the community and the response team. Here is a recent example:*
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> *A groundwater plume with TCE emanating from an industrial facility beneath an environmental justice community put residents at risk for acute exposure to chemical vapors in their homes. After identifying approximately 50 homes with the highest concern, the consultant began requesting access, with limited success. The process to obtain access; schedule and perform sampling; and schedule and install mitigation became cumbersome, delaying necessary activities. In addition, within the area of study, homes first tested revealed indoor air concentrations well above the indoor air screening level for an imminent health risk. Due to the number of confirmed residences with an imminent health risk and the large number of homes still at risk of an immediate health concern, the regulatory agency approved an alternative strategy within an identified area. This strategy included canvasing the neighborhood with environmental regulators and consultants followed by paired air sampling and installation of a mitigation system in the same mobilization, prior to receiving analytical test results. As a result of this approach, critical trust was established, and disruption time decreased. The level of participation and rate of mitigating the exposure increased significantly.*

The Agency for Toxic Substances and Disease Registry (ATSDR) and some state health departments have fact sheets written for the general population on individual contaminants to assist with this risk communication. Chapter 4 of ITRC's *Risk Communication Toolkit* Step 5: Identify Messages discusses key components of composing a risk communication mesage.

Although not vapor intrusion related, the Food and Drug Administration provides multiple examples of how to use plain language in technical documents ([FDA, 2018](#))

3.2   **The definition of the many vapor intrusion screening levels and the implications on human health are difficult to communicate.** It is important to explain how risk to human health requires (1) a completed vapor pathway, and (2) exceedance of indoor air screening levels. Some screening level exceedances (e.g., sub-slab, conduit) do not mean that unacceptable exposure has occurred. For example, people may see high soil gas levels and mistakenly compare them to indoor air screening levels. Explain that mitigation is designed to minimize exposure by interrupting pathways where exposure is occurring, and that this interruption will be verified through monitoring. Consider explaining ways the performance metrics are used to verify that the system is working. Refer to Section 2.4 of the ***Operation, Maintenance, & Monitoring Process/Exit Strategies Fact Sheet*** for the applicable standards and performance metrics. Radon mitigation system resources may also be helpful.

3.3   **Various indoor sources of air contamination can interfere with the vapor intrusion sampling results.** These indoor sources from consumer products are commonly referred to as background sources. Vapor sampling could include monitoring soil gas, sub-slab vapor (soil gas beneath a building), indoor air, crawlspace air, and outdoor air to identify the source(s) of contamination. A diagram may be helpful to explain the difference between a background source and air impacted by vapor intrusion from an exterior contaminant source. If it hasn't been previously communicated, providing a list of interferences, or background sources, to occupants may help explain the pre-existing impacts to indoor air from common consumer products. Emphasize that indoor air sources are not the focus of the vapor intrusion investigation and that most vapor mitigation approaches will not reduce indoor air concentrations due to background sources. Refer to agencies that are responsible for educating about or regulating these background sources (e.g., county or state departments of health).

3.4   **There are situations when rapid response is needed as the vapor intrusion pathway may take time to address and mitigate.** States typically require more aggressive action at properties where short-term exposure risk is applicable due to the concentration of a contaminant. Some states include requirements for rapid response where the trichloroethylene (TCE) screening level is exceeded at locations with specific demographics. Special messaging in conjunction with state and/or local health departments is necessary to address sensitive populations. In some cases, a rapid response (see ***Rapid Response & Ventilation Fact Sheet***) may be appropriate and include relocation of the occupants (e.g., close a school or business) while a long-term plan is implemented. This includes a unique set of concerns for impacted parties.

3.5   **Mitigation may be long term and affected parties will have questions.** Typically, mitigation systems require some form of long-term operation, maintenance, and monitoring (OM&M). At the time mitigation is proposed, it should be clear who is

financially responsible for installation, initial OM&M, and long-term OM&M. Enforceable documents are recommended if responsibilities are split (e.g., responsible party performs installation and initial OM&M and property owner performs long-term OM&M).

3.6   **While many are worried about the effects of toxic exposure, people will also be concerned about other impacts to their lives.** For example, at residential properties, residents may be concerned that environmental responders will track mud on carpets or let out pets. At commercial properties, concerns may include interrupting the workday or discouraging business. At schools, officials may want to avoid any environmental work during school hours. The response team should make sure that building owners, managers, and occupants are aware of the incidental impacts of each of the mitigation technologies proposed for that building (e.g., noise, electricity, disruption). Table 3-1 shows how some impacts and concerns apply to mitigation options. In some cases, informed occupants can help response teams tailor their response to affected buildings. The leaders of the response team should make sure that the contractors performing the installation are aware and respectful of the concerns of building occupants, owners, and managers.

Table 3-1. Mitigation-specific impacts and concerns.								
	Noise	Aesthetics	Building Contents, Belongings	Cost	Permit	Long-Term Management & Institutional Controls	Property Value (increase or decrease)	Notification for Future Occupants
Sub-Slab Depressurization Systems	X	X	X	X	X	X	X	X
Passive		X	X		X	X	X	X
Air Purifying Units	X	X		X		X	X	X
Heating, Ventilation, and Air Conditioning	X			X		X	X	X
Sealing Floors		X	X	X*		X	X	X
Temporary Relocation			X	X		X	X	X
Barrier/Liner	X	X	X	X	X	X	X	X

*Usually the cost of sealing floors is low compared to other forms of mitigation, but there are exceptions.

4   LOGISTICAL CONSIDERATIONS FOR THE COMMUNITY ENGAGEMENT PLAN

The means of communication (e.g., door-to-door outreach [Figure 4-1], public meeting/presentation, flyers) will likely be determined by the goals of the communication, the scope of the project, and consideration of stakeholder/ audience needs as outlined above. Most communication regarding vapor mitigation installation will likely be in the affected structure or a nearby community building as appropriate. The vapor intrusion investigation process should be clearly communicated to the public through public meetings, websites, and social media. Additional efforts are often required to establish the level of trust necessary for an affected resident to grant access to modify their building by installing a mitigation system. The Community Engagement Plan should define the roles and responsibilities of each stakeholder, including responsible parties and their consultants, regulators, state and local health departments, local governments, community advisory groups, etc.

Some things to consider:

- Strategy for door-to-door outreach
  - Sometimes visiting a home multiple times is necessary to make contact, as well as to build needed trust. Consistency and persistence are key. With the advent of video doorbells, fewer people may be answering the door if they are not expecting someone.

Figure 4-1 – Door-to-door outreach.
Source: Getty Images

  - Advance notice is very important. Furthermore, the environmental response team should anticipate such potential inefficiencies or delays when establishing schedules and preparing cost estimates.
  - Use the knowledge of affected parties along with likely concerns for each mitigation type from the attached matrices to anticipate questions. For example, a homeowner may want to know who will pay for the electricity to operate an active vapor mitigation system.
- It is rare that building occupants, managers, or owners know anything about vapor intrusion, which is inherently a complex, technical subject. It may take slow, relaxed discussions at their location or repeated presentations at public meetings to earn their confidence. Multiple forms of communication will likely be necessary.

o Knowledge of the community will help determine the best time of day to contact residents, occupants, managers, or owners. Some states have specific requirements for the number and timing of communication attempts.
o Timing is important. It is essential to make an effort to directly connect with occupants prior to a media announcement.
o Address cultural language barriers by making sure fact sheets and other sources of information are in languages spoken by the community.
o Address technical barriers by creating fact sheets in layman's language keeping in mind that illustrations are very helpful for understanding what a mitigation system does. Illustrated fact sheets are helpful to leave with affected parties both to reiterate presented information and to provide points of contact for further questions. Various state and federal agencies provide generic and site-specific fact sheets that can be given to the affected parties. Links to several fact sheet examples are provided in Table 4-1.

Table 4-1. Links to example fact sheets.
Government Organization and Reference
Agency for Toxic Substances and Disease Registry (ATSDR) VI Fact Sheet • https://www.atsdr.cdc.gov/docs/atsdr_vapor_investigation.pdf
California Department of Toxic Substances Control (DTSC), California Environmental Protection Agency (CalEPA), VI Public Participation Advisory (Appendix E): • https://dtsc.ca.gov/wp-content/uploads/sites/31/2016/01/VIPPA_Final_03_05_12.pdf
Maryland Department of the Environment, Citizen's Guide to Vapor Intrusion, What You Need to Know: • https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/LRP%20-%20Vapor%20Intrusion%20Citizens%20Guide%20Fact%20Sheet%20Update_Sept%202019%20(1).pdf
Minnesota Department of Health Vapor Intrusion Website: • https://www.health.state.mn.us/communities/environment/hazardous/topics/vaporintrusion.html
Minnesota Pollution Control Agency Vapor Intrusion Website: • https://www.pca.state.mn.us/waste/what-vapor-intrusion • https://www.pca.state.mn.us/waste/understanding-your-vapor-intrusion-test-results • https://www.pca.state.mn.us/waste/communication-vapor-intrusion-projects
New Hampshire Department of Environmental Services VI Environmental Fact Sheet: • https://www.des.nh.gov/organization/commissioner/pip/factsheets/rem/documents/rem-30.pdf
New Jersey Department of Environmental Protection VI Pathway Website and Community Outreach for VI Sites: • https://www.nj.gov/dep/srp/guidance/vaporintrusion/ • https://www.nj.gov/dep/srp/guidance/vaporintrusion/community_outreach_guidance.pdf

Table 4-1. Links to example fact sheets.
Government Organization and Reference
New York Department of Health VI Fact Sheets: • https://www.health.ny.gov/environmental/indoors/vapor_intrusion/fact_sheets/
Wisconsin Department of Natural Resources VI Resources for Environmental Professionals: • https://dnr.wi.gov/topic/brownfields/vapor.html • https://dnr.wi.gov/topic/Brownfields/Vaporpublic.html

USEPA
    R9 Triple Site, Sunnyvale, CA Fact Sheet Example
• https://cumulis.epa.gov/supercpad/SiteProfiles/
   index.cfm?fuseaction=second.scs&id=0900265&doc=Y&colid=38595&region=09
   &type=SC
    VI Community Involvement Information
• https://semspub.epa.gov/work/11/176269.pdf

Where new construction is planned, local governments with planning jurisdiction have a key role. Cities, if they are informed and partner with environmental regulators, can use their building approval authority to reinforce the requirements developed by regulators. In some states, local governments are responsible for conducting and/or approving environmental impact studies that impose conditions on development. Furthermore, local officials are often the first to be contacted by people affected by vapor intrusion investigations, as well as by the media covering such investigations. The requirements for a Community Engagement Plan will evolve over the life of the project. It is important that the environmental team repeatedly assess the effectiveness of the communication tools they are using.

5   REFERENCES AND ACRONYMS

The references cited in this fact sheet are included in a combined list with references cited in other fact sheets and technology information sheets prepared by the ITRC VI Mitigation Training team. This reference list, along with an acronym list and glossary, is available on the ITRC web site.