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# VAPOR INTRUSION Project Coordination A Case Study from the Midwest

Vapor intrusion (VI) can create an extremely difficult issue for property owners, responsible parties, and regulatory agencies because, in many cases, it directly affects the public. VI is the migration of volatile contaminants from the ground into overlying buildings and an increasingly prominent issue in subsurface investigations and cleanups, as well as real estate transactions.

VI-related investigations commonly involve off-site properties and coordination with these property owners and the general public is essential to investigating and, if necessary, mitigating VI. This article presents some considerations for coordinating these sensitive projects and a case study of the project coordination efforts undertaken to facilitate cooperation during a recent VI project in the Midwest.

## The VI Exposure Pathway

U.S. state and federal environmental regulatory agencies have identified the VI exposure pathway as a leading concern for public health and many

agencies have developed guidance to investigate, evaluate, and mitigate VI. Since VI can be associated with soil, groundwater, and soil gas/vapor plumes that are hundreds, or even thousands, of feet away from the contaminant source area, VI can impact large geographic areas, affecting numerous businesses and homeowners.

Unlike other exposure pathways, agencies typically require VI testing to be conducted directly beneath and/or within homes, buildings, or other structures, which directly affects building owners, tenants, and homeowners. To conduct this intrusive testing at homes or businesses, environmental consultants



and responsible parties must be sensitive to the needs of the affected parties and develop sound strategies to communicate with local government agencies and private property owners.

The public generally has little knowledge or understanding of the VI exposure pathway. The other more common exposure pathways, such as direct contact and ingestion of soil or groundwater, have been studied for decades. Most people have at least some understanding and familiarity of the risks associated with drinking contaminated groundwater or ingesting contaminated soils. Meanwhile, the terminology and scientific concepts associated with VI are not as tangible or easily understood. Additionally, the science behind VI and the development of appropriate action levels are extremely complex and still under development. This complexity results in a lack of awareness and understanding of the issue; and coupled with the intrusive nature of the investigation and remediation work, makes VI issues among the most difficult to manage.

To address these difficulties, VI investigators and overseeing agencies must develop a strong community outreach program to increase the affected community's awareness of VI. The purpose of this outreach is to notify and educate the local community about VI in a respectful and effective manner. This outreach might include attending public meetings, distributing fact sheets,

conducting face-to-face meetings with affected parties, and coordinating the project with local health departments. In many cases, it is also beneficial to notify local government officials at an early phase in the project to avoid any misunderstandings. In many cases, all of these approaches can be employed, but the appropriate plan of action should be based on the intricacies of the project and the needs of the local community.

### VI Case Study

To help illustrate the concepts identified above, a VI project for a former manufacturing facility in the Midwest is presented as a case study. The facility operated from the 1930s to the 1980s and used degreasing solvents, including perchloroethylene (PCE) and trichloroethylene (TCE). Releases associated with these solvents were identified in soil and groundwater on site and in the vicinity of the site. The surrounding properties were largely industrial, except for a residential neighborhood of approximately 60 homes located immediately adjacent to one portion of the site. Groundwater was present at a depth of approximately 20 feet and flowed from the contaminated property beneath a portion of the residential area.

The regulatory agency required the responsible party to conduct certain interim measures, investigation, and corrective measures, which included work in the off-site residential area. The required activities in the off-site areas included conducting a



door-to-door survey in the neighborhood to determine if the structures had basements and/or active water wells; collecting soil, groundwater, and soil gas samples throughout the adjacent residential neighborhood; evaluating the potential for VI into structures; and mitigating any potential risks associated with VI. Each of these tasks was conducted in step-wise fashion, with several phases of community outreach and coordination between each step.

### **Project Planning**

Prior to conducting any of the activities identified above, a fact sheet was prepared for distribution to all stakeholders. The fact sheet was developed as a communication tool to introduce the project to the local health department, local government, neighborhood groups, and residents. The fact sheet proved to be an extremely useful communication tool, since it was written in a direct and concise manner without heavy technical information or jargon. Additionally, the fact sheet communicated the anticipated work to be performed, proposed timeframes for completing the work, risks associated with the potential contaminants, and contact information for the project representatives.

In conjunction with developing a fact sheet, potential stakeholders were identified. They included government agencies (e.g., the mayor's office and the state environmental regulatory agency), the local health department, and affected property owners. During initial meetings with the government agencies, other important organizations and persons in the community were identified. This additional tier of stakeholders included the township administrator, the Department of Public Works representatives (who also had local environmental responsibilities), a local community development corporation, and a neighborhood group. Each of these stakeholders were introduced to the project in face-to-face meetings. During each of these meetings, stakeholders shared important, specific information regarding the neighborhood.

The purpose of these meetings was to ensure all parties understood the project scope and objectives, identify any early community concerns, as well as discuss the plan for notifying the residents. The need to conduct the activities in an open and collaborative fashion was stressed by all parties. The

local government representatives recommended that the health department be involved with the outreach efforts by assisting the responsible party's consultant with the house-to-house survey and any associated follow-up activities. According to the local government officials, the presence of the local health department representatives provided "credibility" to the situation, since these representatives were familiar with the neighborhood. In addition, an informational letter was developed and sent out (with the attached fact sheet) to property owners and residents before commencing the door-to-door surveys.

Another piece of the community relations puzzle involved dealing with the local neighborhood organizations. In this case, there was an active neighborhood group that met on a monthly basis to discuss community issues. Attendees of these neighborhood group meetings included residents, representatives from adjacent businesses, local school teachers, and police and fire personnel. The responsible party also met with the active neighborhood group and regularly attended its meetings. The presence of the responsible party at these meetings reinforced the commitment to the community and kept the lines of communication open throughout the project.

### **Project Implementation**

Once these initial coordination and outreach activities were conducted, the door-to-door survey was performed in conjunction with the health department. Because of the preceding letter, most homeowners were aware of the survey and the response rate was excellent. While follow-up phone calls were made to several properties, all of the necessary information was completed within approximately two weeks. Any questions or comments regarding the fact sheets were addressed during the door-to-door survey.

During commencement of the initial phases of the project, the potential for VI in several of the properties was identified. As a result, additional work was required in the neighborhood, including indoor air sampling and, ultimately, the installation of VI mitigation systems in several homes. During each phase of investigation/mitigation, information was communicated to the regulatory agency and



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stakeholders, and a plan to further evaluate and address any concerns was immediately put into action. Individual meetings were held with homeowners to explain the proposed testing or mitigation and discuss various issues, such as, heating, ventilation, and air conditioning (HVAC) operation; household chemical storage issues during testing; other items that could impact testing results; and the overall risks associated with VI. After receiving sample results, this information was discussed with the health department and communicated to homeowners.

As expected, some homeowners had concerns regarding health hazards, property values, and the overall intrusiveness of the mitigation work. Face-to-face meetings were conducted, as needed, to further discuss their concerns. The primary concern was property value and potential difficulty of selling a home that was impacted by VI, followed by health concerns. The responsible party offered mitigation systems in each of the homes and provided assurance that the systems would be maintained and the electrical costs for operating the systems would be covered. It was explained to the homeowners that the systems would greatly reduce any potential VI threat, as well as reduce naturally occurring radon, which was prevalent in the area. These meetings were always attended by the responsible parties' consultant and a health department official. Questions of risk were consistently addressed by relaying the conservative nature of the calculations used to determine "safe" levels.

In cases where VI mitigation systems were installed, the responsible party provided regular updates to each of the property owners. System inspections were conducted regularly and by the same people, so property owners could develop a level of comfort with the consultant and the health department representatives.

### **Lessons Learned**

Below are some of the key lessons learned from this project.

**A stratified approach to community involvement was critical to the success of the project.** During the early phase of the project, local government and health department officials advised that

lower-level, boots-on-the-ground stakeholders, such as neighborhood groups, local community development corporations, and other parties, be notified and informed throughout the VI project. Thus, all stakeholders from the mayor's office down to the local neighborhood group and the field representative for the local health department were aware of the work activities and could be used as resources if the impacted parties had questions or concerns.

**A consistent project team should be used throughout the course of the project.** Stakeholders, especially homeowners, became much more open and comfortable when they were greeted with a familiar face. This consistency provided a high level of trust and allowed any problems or questions to be addressed quickly. The project team must not only be consistent, but also be composed of the "right" people for the job. The project personnel should speak and look professional, be respectful and be comfortable in sometimes difficult situations.

**Ongoing communication efforts are required for the project to succeed.** Communication included attending monthly neighborhood meetings, arranging regular face-to-face meetings with the stakeholders, and developing a consistent message.

### **Conclusion**

Since many VI projects involve off-site properties, it is essential to establish a project coordination and community outreach program at the outset of the project. Stakeholders should include not only the local government/health agencies and the impacted parties, but also neighborhood organizations, community development corporations, and other local stakeholders. All stakeholders need to be kept informed and the message and its delivery should be clear and consistent. While there can be challenges with any project, a strong community outreach program can help alleviate some of the hurdles associated with this type of project. **em**