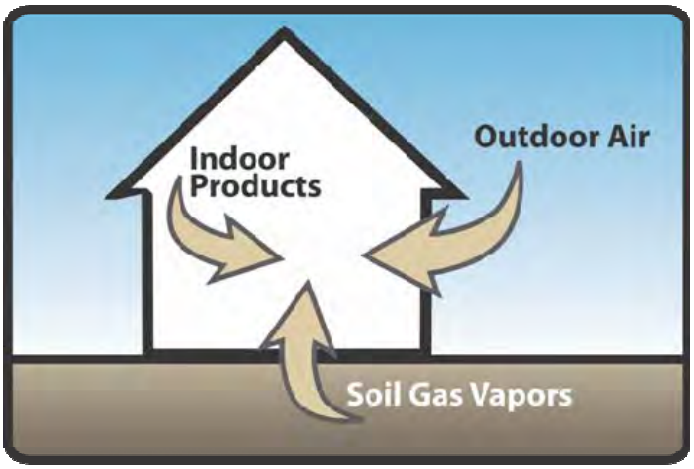
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

VAPOR INTRUSION
PUBLIC PARTICIPATION ADVISORY



FINAL

March 2012

FOREWORD

This document was developed by the Department of Toxic Substances Control (DTSC) under the direction of Ms. Debbie Raphael, Director, and Mr. Stewart Black, Deputy Director of the Brownfields and Environmental Restoration Program. Without their support, completion of this advisory would not have been possible.

The DTSC is issuing this *Vapor Intrusion Public Participation Advisory* (Advisory) for use on sites which have a potentially complete indoor air exposure pathway. The Advisory describes public participation approaches designed to facilitate effective communication and coordination with communities and stakeholders affected by or concerned with vapor intrusion.

DTSC developed the *Vapor Intrusion Public Participation Advisory* primarily as a guide for DTSC staff. Other agencies, environmental consultants, responsible parties, community groups, and property developers may find the Advisory useful.

DTSC encourages users of the Advisory to identify areas for improvement. Please submit comments and suggestions for improvement of the *Vapor Intrusion Public Participation Advisory* to:

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DTSC will review and incorporate comments as needed.

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This Advisory has benefited greatly from input provided by DTSC's Proven Technologies and Remedies Team, the Brownfields Revitalization and Advisory Group, and external peer reviewers.

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ACRONYMS AND ABBREVIATIONS

ATSDR	Agency for Toxic Substances and Disease Registry
CAG	community advisory group
DTSC	California Department of Toxic Substances Control
EERP	DTSC Enforcement and Emergency Response Program
EJ	environmental justice
HI	hazard index
IRIS	USEPA Integrated Risk Information System
LUC	land use covenant
O&M	operation and maintenance
PIO	Public Information Officer
PPS	Public Participation Specialist
TASC	USEPA Technical Assistance Services for Communities
USEPA	U.S. Environmental Protection Agency
VIMA	DTSC's *Vapor Intrusion Mitigation Advisory*
VIPPA	DTSC's *Vapor Intrusion Public Participation Advisory*

1.0 INTRODUCTION

The Department of Toxic Substances Control (DTSC) developed this *Vapor Intrusion Public Participation Advisory* (Advisory or VIPPA) to help determine and implement appropriate public participation coordination and activities for sites where a potential vapor intrusion[1] risk has been identified. The Advisory describes public participation approaches designed to facilitate effective communication and coordination with communities and stakeholders affected by or concerned with vapor intrusion. The Advisory draws on DTSC's experience and knowledge of sites with vapor intrusion concerns as well as the experiences of other agencies.

VIPPA is a companion document to DTSC's *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion into Indoor Air* (Vapor Intrusion Guidance) and DTSC's *Vapor Intrusion Mitigation Advisory* (VIMA). Because this Advisory is to be used in conjunction with the Vapor Intrusion Guidance and the VIMA, it does not repeat information provided in those documents. Please refer to the Vapor Intrusion Guidance and VIMA for background information regarding vapor intrusion and the technical aspects of evaluating and mitigating vapor intrusion.

This Advisory supplements DTSC's *Public Participation Policy and Procedures Manual* (Public Participation Manual). As a supplemental document, the Advisory does not supersede guidance provided in the Public Participation Manual.

The goal of this Advisory is to:

- provide public participation guidance to DTSC staff and practitioners for vapor intrusion-impacted sites
- assist DTSC staff and practitioners with public outreach activities at vapor intrusion-impacted sites
- provide examples of public outreach materials for vapor intrusion-impacted sites (see appendices)

DTSC staff, stakeholders, project proponents and responsible parties may use the Advisory whenever volatile chemicals are a concern during characterization or cleanup of a site. Please recognize that not all public participation elements discussed in this Advisory will be necessary or applicable to a given project. Hence, this Advisory is to be used on a case-by-case basis and to the extent applicable.

[1] Vapor intrusion is defined as the migration of volatile chemicals from the subsurface into overlying buildings (USEPA, 2002).

2.0 PUBLIC PERCEPTIONS AND CONCERNS

The risk posed by the vapor intrusion exposure pathway is often perceived as higher than other exposure pathways because people cannot avoid breathing the air of the environment in which they live and work. In contrast, one can choose to drink bottled water instead of tap water or prevent children from playing in the dirt. The heightened concerns about vapor intrusion risks can make informing individuals that chemicals may have entered their buildings a delicate and often difficult task. The project team should acknowledge, evaluate, and address concerns about the potential or known vapor intrusion risks throughout the investigation, evaluation, and if necessary, mitigation process.

When working on vapor intrusion sites, it is important to recognize that the public is concerned with more than indoor air quality. As regulators, we tend to believe that once we explain what the problem is and what the solution or remedy will consist of, the public will be satisfied. However, experience has shown that the public may still have concerns and questions that the project team should be prepared to address. For example, the public may be concerned about other potential exposure pathways, such as eating fruits and vegetables grown in contaminated soil. An occupant of a potentially affected building may be concerned about the potential health effects regardless of the contaminant source (e.g., subsurface contamination[2] or ambient[3] air). We should keep these additional public concerns in mind when developing communication strategies.

* * *

Examples of Public Concerns Associated with Vapor Intrusion

- Lack of clear information about exposure scenarios, symptoms, and medical treatment for exposure to toxic vapors
- Sense of helplessness regarding the issue
- Disclosure requirements and impacts on property values
- Fear of unknown and unseen chemicals in homes, workplaces and schools
- Whether mitigation measures are adequate for continued building occupation or whether relocation will be necessary
- Impacts to ambient air
- Privacy concerns, especially if indoor air samples are necessary
- Concern for existing lease arrangements
- Potential health risks to pets
- Potential health risks from past long-term exposure before contamination and/or vapor intrusion was identified
- Potential litigation and liability
- Availability of information and points of contact at the various regulatory agencies
- Frequency of sampling to monitor exposure conditions
- Time and funding sources for vapor intrusion investigations, source remediation, and mitigation
- Disruption of living or working arrangements
- Emissions associated with soil vapor extraction treatment or building mitigation systems
- Concern for ability to lease or sell property
- Impacts to children and health sensitive / compromised persons

[2] The term “contamination” or “contaminants”, as used in this Advisory, means a release of a hazardous substance or hazardous waste into the environment (California Health and Safety Code Section 25180.7).
[3] The term “ambient”, as used in this Advisory, means outdoor air at a vapor intrusion site, including concentrations of volatile chemicals from numerous anthropogenic sources in the area or region, such as vehicle exhaust, industrial stack emissions, etc.

3.0 PUBLIC PARTICIPATION CONSIDERATIONS FOR VAPOR INTRUSION SITES

Public participation at sites with potential vapor intrusion concerns is typically more extensive than sites affected by other exposure pathways. In addition to the public participation activities associated with a wider group of concerned community members and stakeholders (as would be conducted for any contaminated site), vapor intrusion investigations and any subsequent response actions require personal contact with property owners, business owners, and occupants of potentially affected buildings.

This section presents topics that are common to multiple steps in DTSC's Vapor Intrusion Guidance process (Figure 1). Although this section briefly summarizes DTSC's public participation framework, the intent is to emphasize elements that are particularly significant when working on sites with vapor intrusion issues. As with any contaminated site, DTSC's Public Participation Manual should be followed and a site-specific Community Relations Plan developed. Please refer to DTSC's Public Participation Manual for detailed discussion of DTSC's public participation framework.

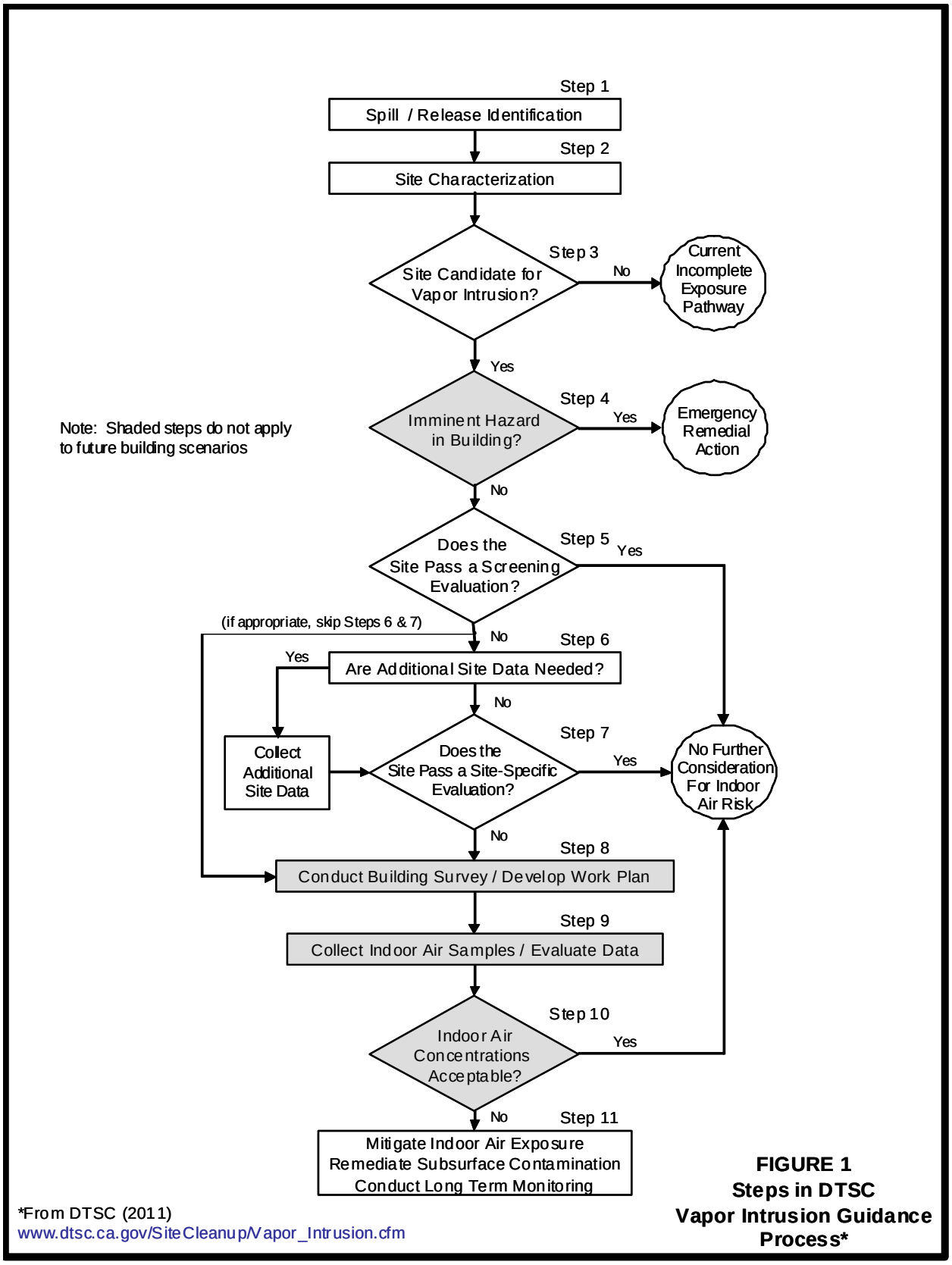
The DTSC project team should include a Public Participation Specialist (PPS) trained to deal with community concerns. The PPS should meet regularly with the other project team members to advise them of stakeholder or community concerns and to develop site-specific communication strategies.

3.1 COMMUNITY PROFILE AND PUBLIC PARTICIPATION PLAN

Evaluating the needs of a community facing vapor intrusion issues can be challenging. Typical approaches for characterizing a community (such as through demographics, newspaper articles, and file reviews) can provide relatively limited information. As discussed further in DTSC's Public Participation Manual, development of a Community Profile[4] and Public Participation Plan can provide more insight into a community. The exchanges between community members and the project team during the development of the Community Profile and Public Participation Plan help define the public participation strategy for a site, build trust and credibility, and provide a foundation for developing a comprehensive Public Participation Plan. Multiple formats may be needed for these exchanges. For example, it may be useful to have a forum in which any concerned community member can participate and then a smaller gathering of people whose property, business, or building is directly affected by vapor intrusion. As feasible, early development of the Community Profile and Public Participation Plan is particularly important for projects with vapor intrusion concerns.[5] Without it, knocking on doors to gain property access can be counterproductive.

[4] A Community Profile is a 'thumbnail' sketch of a community and is essentially a table of contents to the more comprehensive Public Participation Plan.

[5] Delayed development of a Community Profile or Public Participation Plan may be unavoidable in some cases, such as when an emergency response is needed.



*From DTSC (2011)
www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm

FIGURE 1
Steps in DTSC Vapor Intrusion Guidance Process*

3.2 IDENTIFYING COMMUNITY STAKEHOLDERS, ESTABLISHING COMMUNICATION AND WORKING RELATIONSHIPS

Preparation of a Baseline Community Assessment will assist project staff with determining the community's level of interest in the overall site impacts, the vapor intrusion issue, and the level and type(s) of community outreach that will be needed for the project. Please refer to DTSC's Public Participation Manual for details regarding its development and distribution. Preferably, the Baseline Community Assessment should be completed well before sample collection adjacent to, within, or beneath buildings and before the planned remediation approach is discussed and shared.

Informing property owners and building occupants that chemicals may have entered their buildings requires tact and diplomacy. Skillful interaction and planning are critical to successful investigation and response actions. Face-to-face meetings in small groups or individually likely will be necessary prior to any sample collection, and prior to any response actions. For some communities, it may be effective to work with community organizations to improve communications with residents. In the case of businesses, communication with both the business owner or employer and employees will be required. DTSC staff may find themselves caught between employers concerned with unnecessarily alarming their employees and the employee's right-to-know.

If schools are impacted, the interests, concerns, and communication needs of school administrators, teachers, students, and parents may be disparate. Presentations to school boards, meetings with the principal or superintendent, and outreach to parents and teachers will require extensive planning and expertise. The project team should consult with DTSC's Schools Evaluation and Brownfields Outreach Program.

For settings with a large number of building occupants and visitors, such as schools and commercial buildings, it may be difficult to identify those people who are directly affected by the vapor intrusion concern. One approach might be to post signs at entrances notifying people that the building is under investigation or subject to a long-term site management plan. The sign could include a web address or repository location where occupants or visitors can learn more.

3.3 MAILING LISTS

Establishment of project-specific mailing lists is important for communication with communities and stakeholders. Different mailing lists may be suitable for different types of outreach activities and for different project phases. For example, at some stages of a vapor intrusion investigation or response action, the distribution list may be focused on owners or occupants directly affected by the investigation or response action, rather than using the general public participation mailing list established for the overall project. The project manager and PPS should work closely to determine the appropriate mailing list for the specific project activity.

The general DTSC approach is to establish the initial mailing list using a quarter-mile radius from the project site boundary. This quarter-mile distance may not be adequate where (1) the soil vapor and/or groundwater plume extends beyond the project site boundaries and the quarter-mile limit; or (2) the estimated risk level isopleths extend beyond site boundaries and the quarter-mile limit. At a minimum, the mailing list should include residences or buildings that are within 100 feet of the outer limits of plumes or risk isopleths. Canvassing a neighborhood can help identify natural boundaries for developing the initial mailing list, such as changes in land use, natural physical barriers, and highways.

Other entities (also referred to as stakeholders in this Advisory) may be included in a mailing list if they have expressed interest, have political jurisdiction within or adjacent to the potential vapor intrusion area, represent community leadership or advocacy, or need to be aware of planned activities (such as those that will produce loud noises). They may include:

- local agencies
- law enforcement agencies
- non-government organizations
- city councils
- county supervisors
- other city or county departments with an interest in that area
- legislative representatives
- local school boards and officials
- sensitive use establishments (e.g. schools, hospitals) located within the community or in the near vicinity of the potential vapor intrusion area
- water purveyors
- environmental advocates
- neighborhood associations
- chambers of commerce
- realtor associations
- community advocacy groups
- government health officials
- likely healthcare providers for the community
- community service organizations
- other community organizations

DTSC's standard procedure is to address the mailings to "Owner / Occupant" or "Owner / Resident" to ensure all current owners or occupants receive the information. It is good practice to include the property owners on the mailing list even if they do not occupy the property.

The project team should consider the notification requirements of Proposition 65 when establishing the mailing list. See Section 5.1.2 for further discussion.

3.4 TIMING CONSIDERATIONS FOR PUBLIC OUTREACH

When people have been or may be exposed to contamination, providing them with accurate and timely information is extremely important. Timely sharing of information should be balanced against having enough information to answer the questions likely to be asked. *Moving forward with community outreach without being able to explain the potential health risks and how they are being addressed can lead to heightened concerns and potentially jeopardize good community relations.* The more knowledgeable the project team is about the source, toxicology, and vapor intrusion

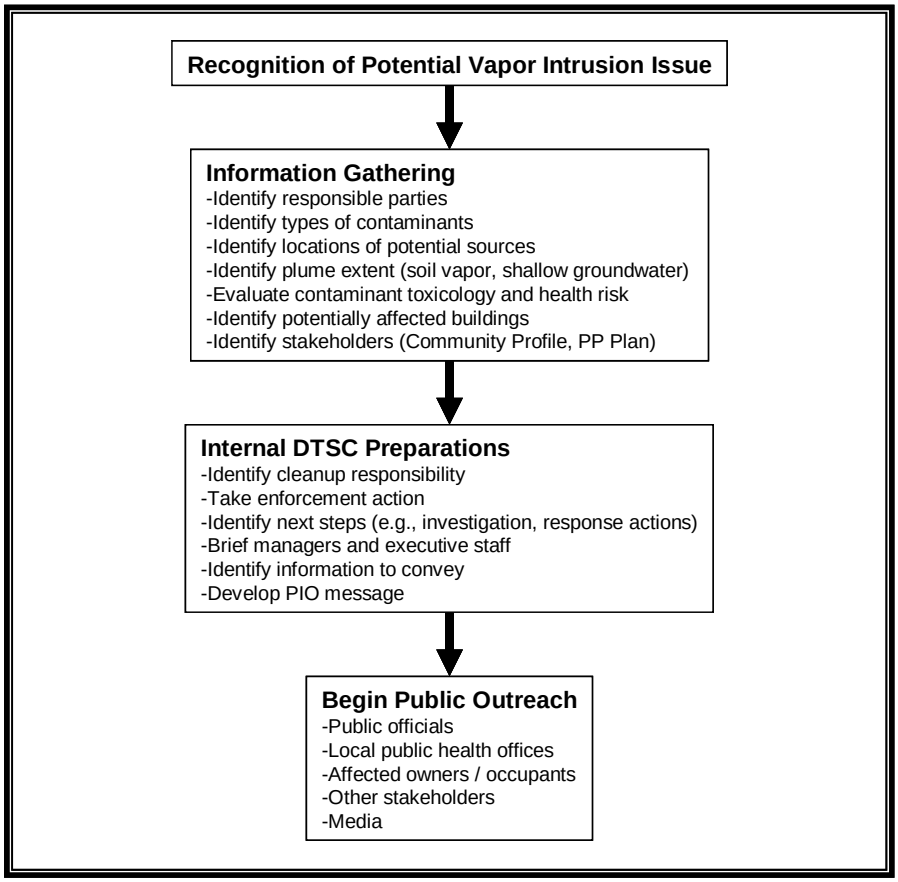
risks, the greater confidence the stakeholders and the community will have in DTSC and the work performed. Figure 2 provides a checklist for initial public outreach at vapor intrusion sites.

Site-specific circumstances may complicate moving forward with public participation. For example, a project may be delayed in moving forward because of a lack of resources (such as for a site with no identified responsible party).

Site-specific factors should be considered when scheduling community outreach activities. Examples of such factors include:

- safety concerns associated with community member attendance of a night meeting
- weekend or evening meetings might be preferable so that community members will not miss work
- conducting work on weekends or during vacations when school is not in session
- accommodating a building occupant's schedule

FIGURE 2
CHECKLIST FOR INITIAL PUBLIC OUTREACH AT VAPOR INTRUSION SITES



3.5 ON-GOING COMMUNICATION

Regular communication with the community and stakeholders is important for vapor intrusion projects during all phases of the investigation and remediation, including the operation and maintenance (O&M) phase (see Sections 5.6.5 and 5.6.6). Mechanisms should be established for reliable, regular and continued communication. Because of the long-term nature of vapor intrusion projects, establishing positive working relationships with a variety of stakeholders and having a consistent point of contact is crucial. The more frequently DTSC staff communicates with the community and stakeholders, the greater confidence they will have in DTSC and the work performed.

The method(s) selected for on-going communications is a project-specific decision. When developing written communications, the project team should consider how effective the materials will be for the target audience. For example, would the information be better conveyed through images than through text? The following factors should be considered on a case-by-case basis:

- language needs (e.g., translation of materials, interpreters, assistance for deaf or blind)
- communication frequency
- logistical needs
- DTSC resource availability
- stakeholder coordination
- funding sources
- privacy considerations (see Section 3.11)

Additional details and guidance for on-going communications are available in the Public Participation Manual. The VIPPA appendices provide communication tools specific to the vapor intrusion pathway.

* * *

Common Communication Tools

- Fact sheets
- Work notices
- Flyers or posters
- Neighborhood newsletters
- Agency contact list
- E-mail notices/updates
- Websites (e.g., DTSC website, project-specific website (if any))
- One-on-one and small group meetings
- Community meetings (e.g., public meetings, workshops, informational sessions)
- Community surveys
- Site diagrams and maps
- Proposition 65 notification forms
- DVDs
- Informational inserts (e.g., utilities bills)
- Public notices in newspapers
- Information repositories (e.g., libraries, community centers, web pages)
- Radio and television informational programs
- Community events (e.g., health or environmental fairs, kiosks, trainings, briefings)

* * *

3.6 PUBLIC MEETINGS OR WORKSHOPS

Public meetings or workshops likely will be needed to support multiple phases of work on a site with vapor intrusion issues. The decision to hold a meeting or workshop should be made on a case-by-case basis, with consideration of community feedback. The project team should brief appropriate parties (e.g., DTSC executive staff, community elected officials, building occupants, and property owners) when planning a public meeting or workshop. Participation of a DTSC toxicologist is often a key element of an effective public meeting or workshop concerning a vapor intrusion-impacted site. Participation of community health officials is also desirable if the project team anticipates receiving questions about symptoms and medical impacts of exposure.

During a public meeting or workshop, the presentation by regulatory staff should generally be limited to about 20 minutes, with the bulk of the meeting time devoted to public questions and feedback. Attendees should be given the option of submitting written questions during the meeting. Suitable community leaders should be invited to attend and, if appropriate, should be asked to give a presentation. To assist in communication, large poster boards showing site information should be prepared and made available to community leaders for their use in informing their constituencies about the issues. Please refer to the Public Participation Manual for detailed guidance for hosting public meetings or workshops.

The project team should carefully consider the presentation content to ensure that the complex concepts often associated with vapor intrusion sites will be clearly communicated. For example, the significance of the actual risk posed by the measured concentrations and the risk management thresholds can be difficult concepts to present (see Section 4 for further discussion). As another example, consistent concentration units for soil gas and indoor air data should be used throughout the meeting for all formats (e.g., verbal, written). The presentation should be targeted to the expected audience. When presenting materials to a wide group of community members, the presentation should also address privacy considerations for those directly impacted by the vapor intrusion issue (see Section 3.11).

3.7 COMMUNITY ADVISORY GROUPS

Formation of a community advisory group (CAG) provides a means through which a community can evaluate and give input on vapor intrusion-related response actions proposed by DTSC. A CAG can be particularly useful for vapor intrusion-impacted residential neighborhoods because these areas often have no organized representation. After DTSC receives a petition of 50 signatures or more to form a CAG, DTSC assists CAG development and formation by publishing a Public Notice soliciting potential CAG members that may be selected to represent the impacted community. Once established, DTSC regularly communicates and confers with members of the CAG and provides them with the opportunity to comment on activities related to the vapor intrusion issues. DTSC is not a CAG member, but participates in meetings to provide information and technical expertise.

* * *

PUBLIC MEETINGS

CASE EXAMPLE 1

DTSC conducted an indoor air study involving 27 residences overlying a trichloroethylene plume in soil vapor and shallow groundwater. Shortly after mailing a fact sheet, the DTSC project manager, PPS, and project toxicologist met with each household. The project team explained in detail the contamination underlying their homes, the vapor intrusion evaluation that was conducted, and the need to sample indoor air. Because acute health hazards were not an issue, it was explained that the concerns were potential long-term exposures. The project team explained the indoor air sampling plan and the possible actions to be taken based on the measured indoor air concentrations. Two rounds of indoor air sampling were conducted in each home. Following each round of indoor air sampling, the project team met with each building occupant to explain the results.

Because the sampling could be intrusive and disruptive, it was critical that a working relationship be established early in the process. In addition to individual homeowner's questions, the community also had concerns regarding the trichloroethylene plume and what this meant for other residents whose homes were not sampled. In addition to meeting with individually impacted homeowners, the project team also conducted public meetings. A community advisory group was formed. The project team presented relevant project information at monthly city council meetings. Finally, the project team provided briefings for the State Assemblyman representing the community.

CASE EXAMPLE 2

DTSC became involved with a community with vapor intrusion issues as part of its Environmental Justice Outreach Program. In addition to the vapor intrusion issue, the community was concerned about lead exposure to children, and foul smelling and tasting drinking water. In order to proactively engage the community early on, DTSC provided a two-hour interactive training course in basic principles of toxicology, which was well-attended and positively received.

CASE EXAMPLE 3

DTSC identified elevated levels of tetrachloroethylene in soil gas samples obtained during an elementary school site investigation. Indoor air sampling was conducted in classrooms that were being used. Thirteen classrooms were found to have indoor air concentration levels above the regulatory threshold and required mitigation. Because of concerns expressed by teachers, parents and community members, numerous public meetings were held at the school. The mitigation worked for all but two classrooms where the indoor air concentrations remained elevated. Because the indoor air investigation took more than one year, it was DTSC's opinion that the exposures in the two impacted classrooms were becoming chronic. DTSC relocated the teachers and children from these two classrooms. The numerous meetings and updates gave the teachers and parents enough information so that they were well informed of the situation. They felt relieved to know that DTSC was protecting the health of the children and teachers.

* * *

3.8 COMMUNICATION MEDIA INVOLVEMENT

Information about buildings considered vulnerable to vapor intrusion impacts should reach property owners, building occupants and local officials prior to media reporting. After they have been informed, the project team may proactively use the media (e.g., television, radio, internet, newspapers) to reinforce and distribute that message to a larger audience. Conveying information using a paid advertisement is likely to be the preferred approach for many sites because little control can be exerted over how reporters or editors handle an unpaid news release.

DTSC policy requires that a Public Information Officer (PIO) coordinate contact with the media. The PIO works with the project team to ensure a consistent, well-defined message and to anticipate questions and develop responses in advance of media interviews or events. Because of the nature of his or her work, the PIO also has the opportunity to develop working relationships with the media. The PIO understands how each medium gathers and presents news, as well as the different needs of each media type, and thus can build a trusting relationship with various media. This trust can facilitate positive interactions and improve the odds that the media will relay and use the information accurately.

3.9 USEPA TECHNICAL ASSISTANCE SERVICES FOR COMMUNITIES PROGRAM

The U.S. Environmental Protection Agency's (USEPA) Technical Assistance Services for Communities (TASC) Program offers educational and technical assistance to help communities better understand and become involved in the cleanup process at contaminated sites. TASC primarily supports the Superfund program administered under the Comprehensive Environmental Response, Compensation, and Liability Act. TASC also assists communities impacted by sites regulated under the Resource Conservation and Recovery Act or equivalent State programs, and environmental problems that affect air or water.

The TASC website provides information about program services, on-going and completed projects, and contact information. The website also provides a list of resources and answers to frequently asked questions. Under the TASC Program, USEPA hires a contractor to provide educational and technical assistance to the property owners and building occupants, and to work with the community to set goals for the project.

The DTSC PPS should inform impacted communities of this resource, especially those with low income and environmental justice (EJ) concerns. In the past, DTSC has assisted communities by using similar USEPA programs or grants. As a result, DTSC established trust in the community and helped the community become knowledgeable about the technical issues of the project.

* * *

CASE EXAMPLE – USE OF USEPA TECHNICAL ASSISTANCE PROGRAMS

On two vapor intrusion-impacted sites involving EJ communities, DTSC staff helped community members to apply for assistance under USEPA's Technical Outreach Services for Communities. This resulted in a USEPA grant that funded a third party technical review. The third party review of the project documents gave the community a greater understanding of the technical issues related to the projects. The technical assistance gave the communities more confidence in the data and helped assure the communities that their concerns were being addressed. This effort helped improve relations between DTSC and the community, turning initial distrust and anger into an amicable, cooperative partnership.

* * *

3.10 ENVIRONMENTAL JUSTICE

If a vapor intrusion-impacted site is located in a community that also has EJ concerns, applicable DTSC policies should be consulted and incorporated into the overall public participation strategy. Information on DTSC policy, fact sheets, and other useful information concerning EJ can be found in the Public Participation Manual and on the DTSC website. Cities and counties may also have EJ resolutions, policies, or other information which should be considered in the development of the site-specific public participation strategy. Additional guidance is available on USEPA's EJ website.

The project team should inform and advise communities regarding available resources for EJ communities. USEPA offers financial assistance to the EJ communities through grants and cooperative agreements. The Environmental Justice Small Grants Program provides financial assistance to eligible organizations to:

- build collaborative partnerships
- identify local environmental and/or public health issues
- envision solutions
- empower the community through education, training, and outreach

In addition, USEPA's Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program provides financial assistance for projects that address local environmental and/or public health issues in communities.

3.11 PRIVACY CONSIDERATIONS

The privacy rights of property owners and building occupants should be protected during the vapor intrusion investigation and remediation process. During various phases of the project, DTSC may receive, compile and maintain personal information about members of the public. For example, the indoor air sampling data and reports of results or survey may contain personal information such as the names of the property

owners and building occupants and addresses of homes where samples were taken or are planned. In general, personal information should not be released to the public if the release constitutes an unwarranted invasion of privacy. Such personal information may be exempt from disclosure under the Public Records Act (Gov. Code, § 6254, subd.(k); Gov. Code, § 11019.9; Civ. Code, § 1798 et seq.). Any privacy concerns should be addressed during activities related to a project with vapor intrusion issues, such as public participation actions, incidental communications with interested community members in the field, DTSC's response to requests made under the Public Records Act Request, and DTSC's response to press inquiries.

Information regarding investigation and response actions on private property and within private buildings (as opposed to public right-of-ways) should be handled in a discrete manner, both to maintain privacy and to address any concerns of the property owners or building occupants. For example, an owner may be concerned about how the information will affect the market value of his or her property if it is widely broadcasted to the public or media. To the extent allowed by law, this concern could be accommodated by providing the property owners and building occupants with the sampling results in a private letter while providing a general summary of the sampling results for public use. A general summary might consist of ranges of values for a given area (large enough to ensure that privacy is maintained) or a list of results that are not keyed back to a given sampling location.

Consideration should be given to how information is provided in work plans or reports of results. A redacted document can be prepared for public use as long as the redacted information is exempt from disclosure in the Public Records Act. For example, a report for agency use would identify the sampling locations by addresses of homes where samples were taken, whereas the companion report for public use would have such personal information redacted.

The privacy rights of the property owners and building occupants have to be balanced against the public's right-to-know. The balancing test should be used on a case-by-case basis, in consultation with DTSC's Office of Legal Counsel.

4.0 RISK MANAGEMENT COMMUNICATIONS

When exposure to volatile chemicals in indoor air is a possibility, it is extremely important to provide accurate and timely information to those persons who are potentially affected. People will be seeking details about the types of chemicals, the levels of exposure, and possible health effects. Through early and on-going outreach, the project team can develop a relationship with and an understanding of the community, and thus be able to convey this information in a manner that is salient to the given situation and audience. Because of the complex subject matter, the team members interacting with the community should have the appropriate skill mix, including individuals trained and experienced in risk communication and individuals knowledgeable in risk assessment concepts.

Effective communication may positively influence the perception of the risk and may provide a sense of empowerment and control over the issue. Key elements of effective risk communication include:

- providing information accurately and clearly,
- establishing and maintaining trust,
- acting with transparency and sincerity,
- developing mutual respect, and
- being responsive.

4.1 EXPLAINING RISK

Explaining potential health risks posed by vapor intrusion is not a simple task. As regulators and scientists, our inclination is to talk in scientific terms or to focus on the risk calculations. In contrast, the audience is likely to be unfamiliar with scientific terminology and unable to relate to the numbers being thrown at them. Rather, the stakeholders affected by the situation will be looking for a clear, concise description of the potential danger. Hence, the project team should be prepared to convey complicated concepts in plain language and in a straightforward manner.

Table 1 highlights concepts that often need to be discussed when the project team explains the risk to community members. When communicating the risk assessment results, the project team should focus on the results that are most relevant to the audience, and should be prepared to explain risk probability in non-scientific terms. It is also important to convey the uncertainty associated with risk assessment.
When explaining risk, the team should be prepared to place the measured concentrations and risk posed by volatile chemicals in indoor air into context so as not to unnecessarily alarm those affected.

Table 1. Concepts to Consider When Explaining Risk

Type of Exposure

Acute Risk (Short-Term)

- Typically occurs in occupational settings where workers are using chemicals as part of their job.
- Often reversible, but depending upon the concentration and chemical inhaled, exposure may result in systemic toxicity with adverse effects to major organs.

Chronic Risk (Long-Term)

- Occurs at a lower dose.
- May occur in residential or commercial (e.g., office) settings.
- Health effects associated with chronic exposures may not be apparent for many years.

Health Effects[1]

Potentially Carcinogenic Chemicals

- Underlying assumption in risk assessment: no exposures that have "zero risk". Hence, some increased risk of cancer is present even at very low exposures to carcinogens.
- Often conveyed as the predicted number of cancer cases in a population of one million people from exposure to a carcinogenic chemical over a lifetime.
- For a given individual, a one-in-a-million cancer risk translates to negligible risk of developing cancer.
- Basis for designating a chemical as a carcinogen (e.g., shown to cause cancer in people, shown to cause cancer in animals).

Non-Cancer Health Effects

- Effects are varied and dependent upon the specific chemical (e.g., respiratory ailments, toxicity to major organs, blood disorders, birth defects, developmental disorders).
- Concept of a threshold dose (i.e., an exposure below which no toxicity will occur).
- Determined by comparing the actual or estimated level of exposure to a chemical to a level of exposure that will not produce toxic effects.

Chemical Toxicity[2]

- Concentrations of chemicals measured in indoor air are typically found in the parts per billion by volume range or lower, and are below thresholds that cause short-term effects (e.g., headache, respiratory irritation) in people.
- Higher concentrations of chemicals in indoor air, that may cause health effects, are typically found in occupational settings.
- Carcinogens have specific target organs (e.g., benzene causes acute myelogenous leukemia; vinyl chloride causes a very specific type of liver cancer).

Estimating Risk

- Examines issues related to specific contaminants, such as: environmental fate and transport; exposure assessment; and evaluating potential toxicity using the latest scientific knowledge. Each of these basic components is integrated in the risk assessment process to determine the potential risk associated with exposure to a chemical.
- Explain how DTSC uses risk assessment when making regulatory decisions, such as the need for mitigation or remediation of the risks posed at a site.
- For the vapor intrusion pathway, indoor air concentrations are either estimated based on vapor intrusion models or directly measured by indoor air sampling.
- Indoor air exposures and subsequent risks are defined for each specific exposure scenario, such as residential, school, industrial/commercial or recreational.
- As applicable, explain results in terms of sensitive populations who may have a greater susceptibility to the toxic effects of these chemicals (such as the very young, old and immuno-compromised individuals).

1 The project team should be prepared to discuss risks and health effects associated with site-related contaminants as well as other compounds that may be detected in indoor air.

2 Depending on a person's existing health conditions, additional support services may be required, including those of medical and/or public health professionals from the county or the State.

4.2 CHEMICAL-SPECIFIC FACT SHEETS

Chemical-specific fact sheets can be used to help convey toxicity information about volatile chemicals encountered at a given vapor intrusion-impacted site. When selecting or developing a chemical-specific fact sheet, the project team should evaluate the content to ensure that it is appropriate for the target audience. Care should be taken to ensure that toxicity information is conveyed in a manner that is understandable and useful to the community members. Some information sources may be too technical to meet the community's needs.

Chemical-specific fact sheets can be obtained from available sources of toxicity information, including:

- ToxFAQs, prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), Division of Toxicology, Center for Disease Control. Each chemical-specific summary is based on information from the ATSDR Toxicological Profiles and Public Health Statements. ATSDR ToxFAQs, Toxicological Profiles and Public Health Statements can be found at www.atsdr.cdc.gov.

- The California Environmental Protection Agency, Office of Environmental Health Hazard Assessment Toxicity Criteria Database, which provides California chemical-specific cancer slope factors, unit risk factors, acute Reference Exposure Levels, and chronic Reference Exposure Levels, along with detailed, supporting documentation. The Toxicity Criteria Database is available at www.oehha.ca.gov.

- The USEPA Integrated Risk Information System (IRIS), which provides summaries of key information on carcinogenic and non-carcinogenic health effects of chemicals as well as federal cancer slope factors, unit risk factors, reference doses and reference concentrations for specific chemicals. IRIS is available at www.epa.gov.

Readily available fact sheets may cover all possible toxic effects over a wide range of potential exposure levels. If these fact sheets are provided directly to community members, the project team should be prepared to interpret the fact sheet and to explain the fact sheet based on the estimated or measured indoor air concentrations.

If the project team elects to develop a project-specific fact sheet, these available fact sheets could be a useful resource. Appendix A includes a sample fact sheet for a commonly encountered volatile compound, tetrachloroethylene.

4.3 HOW RISK MANAGEMENT DECISIONS ARE MADE

Risk management is the process of integrating the risk assessment with other considerations, including, but not limited to regulatory requirements, technical feasibility, public acceptance, legal concerns and economic impacts. For vapor intrusion sites, it is not simply a matter of collecting indoor air samples, measuring concentrations of chemicals in indoor air and estimating potential indoor air risks. Rather, other confounding factors often need to be considered when making risk management

decisions. Such factors might include potential indoor sources of chemicals and levels of chemicals found in ambient air that may contribute to the indoor air environment. Some key factors to consider when explaining how DTSC makes risk management decisions include:

- potential indoor sources of volatile chemicals
- point of departure for the decisions
- response actions

4.3.1 Sources of Volatile Chemicals Other Than Subsurface Contamination

The project team should explain that building materials and household products may contribute significantly to volatile chemical levels in indoor air. Specific items to focus on are:

- new carpeting
- flooring or furniture
- dry cleaned clothes
- recent painting
- furniture or cabinet re-finishing
- spray adhesives or cleaners

To help put these background sources of volatile chemicals into perspective, USEPA recently published a technical report evaluating measured concentrations of volatile organic compounds in the indoor air of thousands of residences in the U.S. from sources other than vapor intrusion (USEPA, 2011). Appendix C provides an example educational handout that identifies some common sources of volatile chemicals in indoor air. Other resources include:

- *Chlorinated Chemicals in Your Home* (www.arb.ca.gov/research/indoor/clguide.pdf)
- *Reducing Indoor Air Pollution: A Serious Public Health Problem*, (www.arb.ca.gov/research/indoor/rediap.htm).

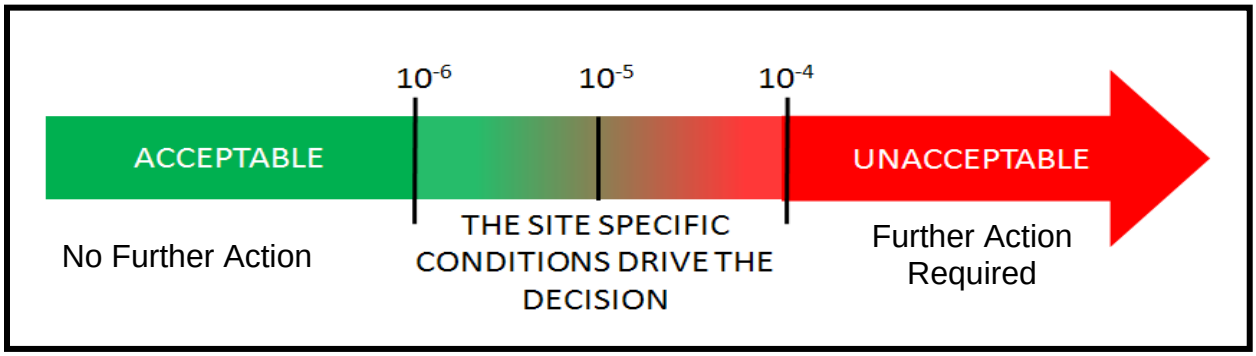
An important risk consideration to communicate to building occupants is the concept of ambient or background levels of volatile chemicals. Because volatile chemicals (e.g., benzene, trichloroethylene, tetrachloroethylene) may be found in the outside air of urban areas, removal of the indoor source may not reduce their concentrations in indoor air. This possibility should be explained to building occupants to avoid confusion. As an example, DTSC conducted an indoor air investigation in a southern California residential area where both indoor and outdoor air samples were collected. One resident was shocked to learn that the ambient air contained numerous chemicals and that the indoor and outdoor air concentrations were the same. The difficult concept here is that the risk from outdoor air may be significant, yet nothing may be done in the short term to reduce these ambient risks.

4.3.2 Point of Departure for Risk Management Decisions and Risk Management Range

Another concept that often needs to be explained is how DTSC determines when the potential risk posed by indoor air concentrations of volatile chemicals is acceptable risk and when it is not. For many decades a "one-in-a-million" cancer risk has been widely considered as an acceptable risk level. A "one-in-a-million" cancer risk (often denoted as 1×10^{-6}) is the probability of one additional cancer case in one million people exposed to a given concentration of a carcinogenic chemical. For the most part, regulatory agencies, including DTSC, have adopted a cancer risk of 1×10^{-6} and a hazard index (HI) less than 1 as a de-minimis risk, or level of risk that is too small to be of concern (sometimes referred to as a "virtually safe" level).

DTSC uses a cancer risk of 1×10^{-6} and a HI of less than 1 to be the "point of departure" for risk management decisions. If the estimated cancer risk and hazard are less than these points of departure, as indicated by multiple lines of evidence, generally speaking, no further response action for indoor air is necessary. For residential or school settings where sensitive receptors are involved, DTSC may require mitigation of vapor intrusion indoor air risks above 1×10^{-6}.

If the potential cancer risk is estimated to fall between 10^{-6} and 10^{-4}, the site-specific conditions will determine if the potential risk is acceptable or not. Conversely, indoor air concentrations of volatile chemicals associated with a potential cancer risk above 10^{-4} are considered unacceptable.



In communicating potential cancer risk, one should keep in mind that potential cancer risk estimates should be presented as having one significant figure because the uncertainty about these estimates is generally large (i.e., one order of magnitude or greater [USEPA, 1989]). It is important to communicate that although two risk estimates might be numerically different, when the uncertainty associated with the estimate is considered, the meaning of the numbers may indicate the same level of potential risk.

4.3.3 Response Actions

Sites with risk or hazard from volatile chemicals in excess of these points of departure may require a response action and may require long-term environmental monitoring. The project team should describe the potential response actions that can be taken based on the risk-management decision. Some examples of these actions include: source remediation, continued monitoring (e.g., soil vapor, sub-slab, crawl space vapor or indoor air quality), installation of a vapor intrusion mitigation system, and covenants to restrict land use. The team should emphasize that there is no simple "one size fits all" risk management guide. All risk management decisions are made on a site-by-site basis, supported by both site-specific and chemical-specific data as determined through multiple lines of evidence.

4.4 PAST EXPOSURE CONCERNS AND ADDITIONAL SUPPORT NEEDS

Once soil vapor or indoor air contamination is discovered, questions about past exposures may be raised. Because DTSC does not conduct epidemiology or health studies in communities, it cannot directly address these issues. However, DTSC coordinates and works closely with the California Department of Public Health which looks at past exposures and actual health effects. The DTSC project team also coordinates with county health officials to address health questions and concerns. These support agencies should be brought into the project early on as part of the communication strategy and public outreach.

4.5 ADDITIONAL HEALTH CONCERNS

Although the toxicologist on DTSC's project team can provide an explanation of the results of the site-specific health risk assessment, property owners and building occupants often express other health concerns or fears related to volatile chemicals. The project team should be sensitive to these health concerns. The primary concern is whether the contamination has caused or contributed to their health problems. Individuals with illnesses such as cancer or asthma sometimes assume that the blame lies with the site contamination. DTSC does not have the expertise or authority to conduct a public health and disease study. DTSC will coordinate with the California Department of Public Health and local health departments to help address the health concerns. Individuals should be encouraged to discuss their health issues with their physicians.

* * *

ADDITIONAL HEALTH CONCERNS

CASE EXAMPLE 1

For the existing and proposed schools of the Los Angeles Unified School District, public meetings concerning the vapor intrusion issues typically include a medical toxicologist from the County Department of Public Health. While these health issues are not site-related, concerned parents can ask questions about skin disorders, cold and flu symptoms and breathing difficulties such as bronchitis and asthma. It has also been beneficial to have a pediatrician present. The combination of toxicology and clinical medicine helps address community concerns and parent's fears and anxieties.

CASE EXAMPLE 2

For many sites where shallow groundwater has been impacted with VOCs, in addition to vapor intrusion, people often express concern about homegrown produce and whether fruits and vegetables are safe to eat. There are two peer-reviewed studies that address this concern. The first study was conducted in northern Utah. Groundwater contaminated with trichloroethylene migrated off-site into communities surrounding Hill Air Force Base. Utah State University conducted a multi-year monitoring program to investigate the potential uptake and transfer of trichloroethylene into fruit (Doucette et al., 2007). The second study was conducted by the State of Oregon, Department of Environmental Quality, which evaluated the safety of homegrown produce irrigated with contaminated groundwater near the Eugene Railyard. Both studies showed that volatile organic compounds did not accumulate in plant or fruit tissue and concluded that eating homegrown produce irrigated with well water containing low levels of solvents is safe for both adults and children. DTSC has used these studies to address the homegrown produce concern at several vapor intrusion sites where the issue was raised.

* * *

5.0 PUBLIC PARTICIPATION ACTIVITIES ASSOCIATED WITH STEPS IN THE DTSC VAPOR INTRUSION GUIDANCE PROCESS

While implementing DTSC's Vapor Intrusion Guidance process (shown in Figure 1)[6], the project team will need to carry out public outreach activities in conjunction with each step. Typically, the outreach will entail one-on-one interactions with those directly affected by the vapor intrusion issue as well as interactions with a wider group of community members and other stakeholders. Throughout the process, the project team will need to be sensitive to stakeholder concerns (see Section 2) and be conscious of the imposition that investigation activities and response actions may have on business operations and residential living.

This section outlines public participation considerations for each step in DTSC's Vapor Intrusion Guidance Process. Figure 3 illustrates possible public participation elements for each step. Please recognize that not all activities listed for a step will be applicable for a given project. The appendices contain materials to assist the project team with public outreach activities during various stages of the vapor intrusion evaluation process.

5.1 SPILL IDENTIFICATION, SITE CHARACTERIZATION, RECOGNITION OF POTENTIALLY COMPLETE VAPOR INTRUSION EXPOSURE PATHWAY (STEPS 1 THROUGH 3)

5.1.1 Stakeholder Identification

Identification of community stakeholders should begin shortly after a potentially complete vapor intrusion exposure pathway is discovered. See Section 3.2 and the Public Participation Manual for discussion regarding stakeholder identification. In cases where enforcement actions have been initiated, the relevant project files can be examined for public participation materials such as mailing lists, community profiles and public participation plans.

5.1.2 Proposition 65 Disclosure Requirement

When the vapor intrusion resulted from an illegal discharge or threatened illegal discharge of hazardous waste, certain DTSC employees may be subject to the disclosure requirement of California Health and Safety Code Section 25180.7, which is part of the Safe Drinking Water and Toxic Enforcement Act of 1986 (commonly known as "Proposition 65"). Designated government employees are required to disclose, to the appropriate local Board of Supervisors and the local health officer, actual or threatened illegal discharges or hazardous waste when such discharges are above a specified risk level. Appendix E includes an example of a Proposition 65 disclosure letter. The decision as to the applicability of the Proposition 65 disclosure requirement should be made in consultation with DTSC's Office of Legal Counsel.

[6] Please refer to the Vapor Intrusion Guidance for detailed discussion of the process.

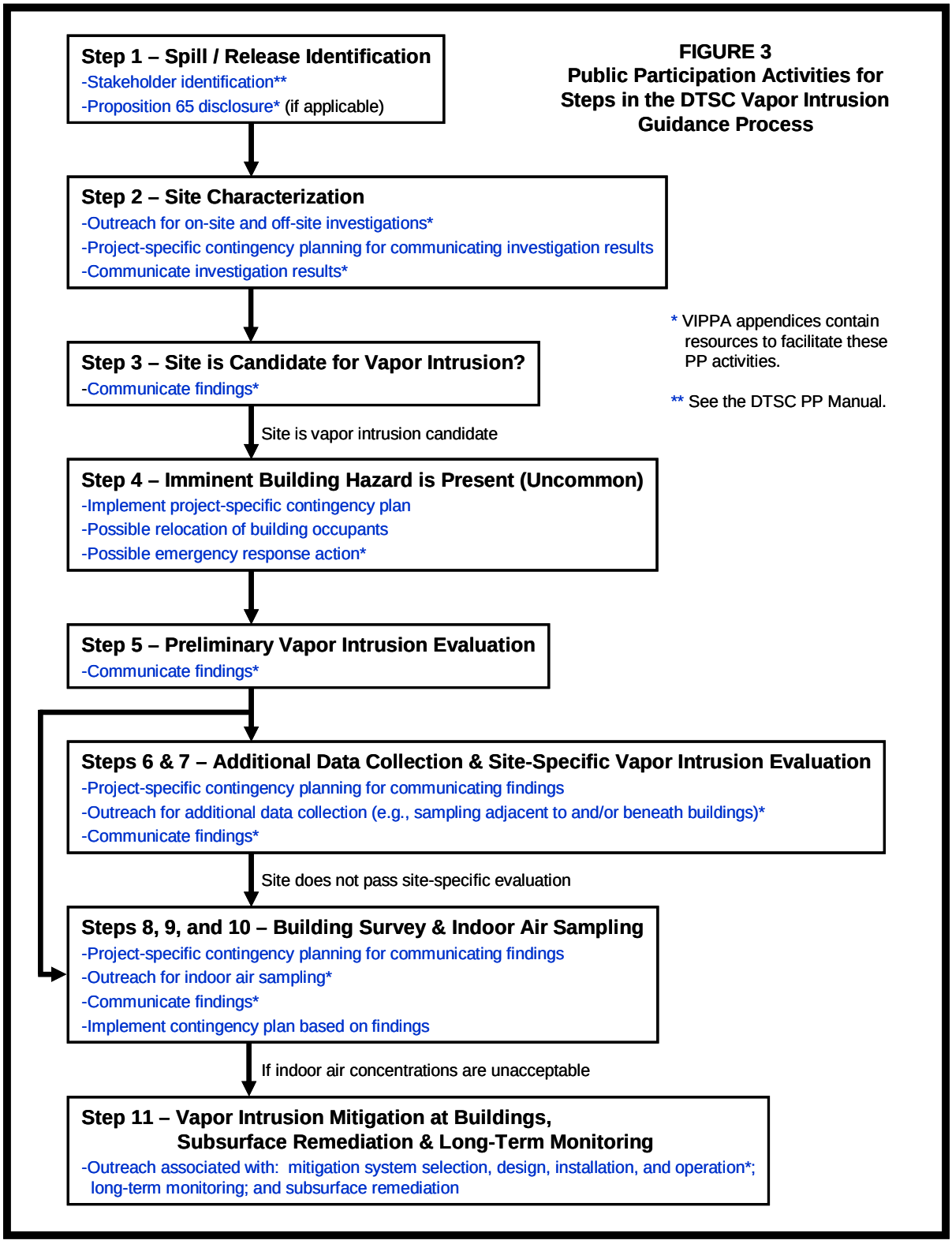


FIGURE 3
Public Participation Activities for Steps in the DTSC Vapor Intrusion Guidance Process

* VIPPA appendices contain resources to facilitate these PP activities.

** See the DTSC PP Manual.

5.1.3 Off-Site Characterization Activities

Community members should not first learn about potential vapor intrusion issues in their neighborhood from a drilling crew in front of their homes. For investigation activities within the public right-of-ways, outreach typically targets the neighborhood or community in which the activities will be conducted. The outreach might include an informational fact sheet about the site and planned investigation activities. If community feedback is forthcoming about the drilling or sampling activities, a public meeting may be scheduled to explain the purposes of the activities. Subsequent outreach materials might include a work notice notifying the community of the investigation schedule and informational fact sheets conveying the investigation progress.

Additional public outreach will be necessary if characterization activities progress onto private property. At this stage, the project team will have one-on-one interactions with property owners in order to discuss the investigation activities proposed or planned for that particular property, and to negotiate an access agreement. As feasible, the project team should adjust the outreach approach to accommodate the concerns and needs of the specific property owner.

When developing the work plans for off-site characterization activities, the project team should develop a project-specific contingency plan that includes triggers for subsequent steps in the investigation, specific response actions, and the types of outreach activities that will be needed for those directly affected by the investigation, the neighborhood or community, and other stakeholders.

The outreach activities appropriate for a given project should be determined on a case-by-case basis, as discussed in Section 3.5. Appendix A contains of the following outreach materials that might be useful at this stage in the project:

- Example Fact Sheet: Investigation Findings
- Example Fact Sheet: Site History
- Example Fact Sheet: Initial Off-Site Investigation
- Example Fact Sheet: On-Going Investigation
- Sample Fact Sheet: Vapor Intrusion
- Guidelines for Access Agreements

5.1.4 Communication of Vapor Intrusion Exposure Pathway Findings

Once people are made aware of the investigations in their community or neighborhood and/or a potential vapor intrusion issue, on-going communications will be needed to keep them informed of the investigation progress and findings. See Sections 3.4 and 3.5 for discussions regarding possible outreach approaches and timing considerations for this outreach.

5.2 IMMINENT VAPOR INTRUSION HAZARD (STEP 4)

Step 4 requires the evaluation of acute hazard in an existing building. An imminent hazard may be identified based on measured volatile chemical concentrations, the presence of odors in the building under investigation, observing illnesses in building occupants that may be linked to inhaling volatile chemicals indoors, or other building-specific factors. While this situation is not very common, indoor air concentrations in some instances (such as around former dry cleaning operations) have approached acute threshold levels. Communication of acute hazard (see Section 4.1) is especially challenging as it will likely entail relocation of the building occupants and an emergency response action. In addition, the DTSC project team will need to be prepared to address other concerns associated with occupant relocation.

Emergency response actions can include additional soil vapor or indoor air sampling to better estimate the risk posed by vapor intrusion. The results of this sampling can trigger the need for rapid implementation of vapor intrusion mitigation measures. All potential decisions and actions should be presented and discussed with the occupants prior to any sampling and analysis activities so that there are no surprises resulting in undue fear or panic. Cooperation and permission from property owners and building occupants are needed for access to the building. Appendix A includes guidelines for developing access agreements.

When a building evacuation or emergency response is needed, the DTSC project team should consult with DTSC's Enforcement and Emergency Response Program (EERP) staff. USEPA's relocation guidance, *Superfund Response Actions: Temporary Relocations Implementation Guidance* (USEPA, 2002a) is the best available guidance for use in such situations.

At the present time, DTSC generally has two options for facilitating temporary relocation of building occupants or performing an emergency response.

Option 1. If a responsible party or project proponent has been identified, it will be asked to implement the emergency response action under DTSC's oversight. The process for coordinating with the responsible party or project proponent (including funding mechanisms) should be included in the project contingency plan.

Option 2. If a responsible party or project proponent has not been identified to provide funding for the emergency response action, DTSC's EERP Performance Manager can submit a Request for Federal Action to the USEPA Region 9. The DTSC project manager, toxicologist, PPS, and PIO should collaborate with EERP to provide the information needed for the request. Appendix E includes an example of the Request for Federal Action.

* * *

Common Concerns Associated with Occupant Relocation

- Who is responsible for the relocation costs?
- What are their costs for food and lodging?
- If they cover costs up front, will they be reimbursed? If so, when?
- How will elderly, disabled, and children with special needs be accommodated?
- How will pets be accommodated?
- How can relocation be arranged so that normal daily activities are not impacted?
- Will they have some access to the property?
- Will their visits to the property need to be supervised?
- How will they continue to receive their mail?
- How long will the relocation last?
- Can they refuse relocation?
- What happens if relocation adds time and distance to performing everyday functions like driving to school and work?

* * *

5.3 ADDITIONAL SITE DATA COLLECTION AND SITE-SPECIFIC VAPOR INTRUSION EVALUATION (STEPS 6 AND 7)

The additional data collection during Step 6 typically entails sampling beneath buildings (e.g., within crawl spaces, below the slab) and thus are more intrusive than the activities that occurred during Steps 1 through 3. The project team will have direct interactions with owners and occupants of the building under investigation, both to arrange for the investigation and to convey the results. Additional public outreach may be needed to inform and to address concerns of other stakeholders. VIPPA contains the following resources to facilitate Steps 6 and 7:

- Sample Letter to Occupants and Owners (Appendix B)
- Sample Fact Sheet: Subslab Sampling (Appendix B)
- Sample Fact Sheet: Vapor Intrusion (Appendix A)
- Sample Fact Sheet: Site History (Appendix A)
- Guidelines for Access Agreements (Appendix A)
- Guidelines for Results Transmittal Letters (Appendix D)

5.3.1 Investigation Work Plans

The investigation work plan should have sufficient details so that property owners, building occupants, and the sampling team have a clear understanding of the activities that will or may occur.[7] The work plan should address concerns of the building occupants as well as the considerations identified in Table 2. Additionally, privacy considerations may warrant redacting the personal information from the work plan for

[7] Please refer to DTSC's Vapor Intrusion Guidance for a detailed discussion of crawl space or subslab sampling methods.

public use (as long as the redacted information is exempt from disclosure under the Public Records Act, as discussed further in Section 3.11).

The project team is encouraged to include a contingency plan in the work plan that identifies what response actions will be taken based on the concentrations measured during the investigation. For example, the contingency plan can identify a concentration threshold below which the risk posed by vapor intrusion is not a concern and a concentration threshold above which the building would be designated as having a imminent building hazard. Each response action should have an associated outreach strategy that identifies who, how, and when building owners, occupants, and other stakeholders will be informed.

The project team should develop a fact sheet to facilitate the public's understanding of the work plan and the sampling process (see Appendix B for an example). Project-specific factors (such as language translation needs, occupant knowledge or education level, past communications) should be considered when preparing the fact sheet.

Table 2. Public Participation Elements in Investigation Work Plans That Include Subslab and/or Indoor Air Sampling

Public Participation Elements
▪ A communication strategy that addresses the most effective method for keeping the occupants informed of the upcoming sampling event.
▪ Interactions with occupants regarding access to the target sampling locations.
▪ Expected disturbances within the building (e.g., for sub-slab sampling, how flooring will be restored to a condition acceptable to the occupant)
▪ Considerations for accommodating occupants' schedules or other time constraints.
▪ Identification of sampling team members and their expected roles (including a translator if necessary).
▪ How the occupant's personal information will be managed (see Section 3.11).
▪ How data will be presented for agency, occupant/owner, and general public use (see Section 3.11).
▪ Anticipated method and timing for communicating the sampling results to the property owners and building occupants.[8]
▪ A contingency plan to ensure that the project team, building owners and occupants, and other stakeholders understand actions to be taken based on pre-established action levels.

[8] The estimated timeframe for providing sampling results should reflect laboratory turnaround time, quality assurance/quality control of the data, review and analysis by regulatory staff, and time to generate notification letters and follow-up fact sheets. Careful consideration should be given to the method of communication (e.g., individual letters, one-on-one meeting, group meeting) that will best allow the project team to address questions.

* * *

Example of Communication Strategy for Investigation Work Plans
(listed in order of occurrence)

- First contact by mail via a personalized letter or fact sheet.
- Project team contacts the building owner by telephone to schedule a meeting. Alternatively, contact the tenant by telephone to schedule a meeting, provided that the property owner has been informed and is agreeable to that approach.
- Face-to-face meeting with occupants during which sampling locations and schedules are discussed, and any property restoration requirements are addressed. For indoor air sampling, the pre-sampling interview may also be conducted during this meeting.
- Follow-up reminder letter prior to the sampling event.
- A day or two before the sampling event, telephone reminder or flyer to the occupant regarding the sampling appointment.

* * *

* * *

Indoor Air and Subslab Sampling Etiquette

- Be professional in approach and appearance.
- Arrive at the scheduled time. Occupants should be notified if the sampling crew is delayed.
- Regulatory personnel should wear their identification badges.
- Bring plenty of business cards.
- Sampling crew should be composed of at least two people.
- Follow the norms of the household. The field crew should wipe their feet before entering the home and remove their shoes if warranted.
- Ask for permission before entering any room of the home and be accompanied by the occupant/owner at all times. Only take photographs if given permission.
- Bring material to protect flooring around sampling points and minimize dust generation during slab drilling and probe installation.
- Collect all investigation-derived waste after completion of probe installation and sampling activities.
- If applicable, bring cushioning material (such as bubble wrap) to protect furniture surfaces from the sampling canisters.

* * *

5.3.2 Considerations for Crawl Space and Subslab Sampling Activities

The project team should accommodate the building occupants' schedules and minimize disruption or inconveniences to the extent feasible. The team should also be sensitive to any concerns of the property owners or building occupants during the sampling activities. It may be useful to provide the following during sampling events:

- responses to questions and additional information as requested, including translated material and access to an interpreter when necessary or requested
- DTSC expertise, and as needed, support from other agencies
- written information concerning the sampling process, including dates and details on how and when the sampling results will be communicated (see Appendix B for an example)
- contact information for questions and concerns

5.4 BUILDING SURVEY AND INDOOR AIR SAMPLING (STEPS 8 and 9)

Steps 8 and 9 will require multiple visits to the buildings to be sampled, including visits for the pre-sampling interview with building occupants, placement of air sampling equipment, retrieval of air sampling equipment, and discussion of indoor air sampling results with building occupants (see Section 5.5). VIPPA contains the following resources that may be useful for Steps 8 and 9:

- Sample Notification to Tenants (Appendix C)
- Sample Letter to Occupants / Owners (Appendix C)
- Sample Fact Sheet: VOCs in Household Products (Appendix C)
- Sample Instructions to Occupants (Appendix C)
- Sample Fact Sheet: Vapor Intrusion (Appendix A)
- Sample Fact Sheet: Site History (Appendix A)
- Guidelines for Access Agreements (Appendix A)
- Guidelines for Results Transmittal Letters (Appendix D)

5.4.1 Indoor Air Sampling Work Plan

The indoor air sampling work plan[9] should address considerations for the building occupants, the public participation elements identified in Table 1, and the considerations discussed in Section 5.3.1. As discussed in Section 5.3.1, the project team should prepare a fact sheet to facilitate the occupant's understanding of the work plan, sampling process, and possible contingencies. The team should discuss the public participation approach with occupants to ensure that their needs are met. In communications with occupants of impacted buildings regarding the indoor air sampling activities, the project team should emphasize the importance of providing accurate information, following sampling event instructions, and being available at the scheduled sampling time.

[9] Please refer to DTSC's Vapor Intrusion Guidance for a detailed discussion of the indoor air sampling work plan and other activities.

As discussed in DTSC's Vapor Intrusion Guidance, the work plan should include a contingency plan to be implemented based on the indoor air sampling results. DTSC's Vapor Intrusion Guidance provides examples of possible contingencies based on indoor sampling results. Some examples of contingencies include: no further remedial action if the risk is below the point of departure for risk management decisions (see Section 4); monitoring; vapor intrusion mitigation (see Section 5.6); and source remediation. If an acute hazard is identified (not common), another contingency might be the relocation of building occupants (see Section 5.2). The project team should discuss the contingency plan with building owners and occupants and should provide materials explaining action levels and actions that will be taken based upon the indoor air sampling results. Occupant and owner involvement in the planning process will help build and maintain their trust in, and cooperation with, DTSC, and help avoid misunderstandings and misconceptions. The project team should identify the outreach activities to be implemented in conjunction with the contingency plan, including the approach, timeframe for outreach, and identities of those who will be contacted.

5.4.2 Indoor Air Sampling Events

Indoor air sampling events may heighten anxiety of building occupants because of concerns about potential exposure and disruption of daily routines. The possible contingencies associated with measured indoor air concentrations should be clearly conveyed to the property owners and building occupants prior to the sampling event. Sensitivity to the concerns of the owners and occupants is essential during indoor air sampling. The project team should accommodate the building occupants' schedules and minimize disruption or inconveniences to the extent feasible. Project staff may have to conduct sampling after normal work hours or in the evening when the occupants are available or the area is accessible.

Staff should consider providing the following during the pre-sampling interview and/or sampling event:

- fact sheet identifying household products that commonly contain volatile chemicals (see example in Appendix C)
- instructions to occupants (see example in Appendix C)
- written information concerning the sampling process
- responses to questions and additional information as requested, including translated material and access to an interpreter when necessary or requested
- DTSC expertise and as needed, support from other agencies
- contact information for questions and concerns
- dates and details about how and when the sampling results will be communicated

5.5 INDOOR AIR SAMPLING RESULTS EVALUATION, RESPONSE ACTIONS, AND CONTINGENCY PLAN IMPLEMENTATION (STEP 10)

Communicating indoor air sampling results to property owners and building occupants can be difficult for multiple reasons. For example, detectable concentrations of subsurface contaminants are often encountered, even if vapor intrusion is not transpiring at the building in question. Also, the potential risk posed by the indoor air concentrations can be challenging to explain. In addition, concentration units for air samples can be difficult to explain and understand. The project team typically conveys the indoor air sampling results to property owners and building occupants individually or in small groups given the privacy considerations (see Section 3.11). The team members providing the results should have suitable expertise (e.g., toxicologist, PPS) so that questions and concerns can be adequately addressed. As appropriate, the project team should have support from other agencies (e.g., county health department, California Department of Public Health). Although having the right expertise is important, the number of team members should be appropriate for the situation (e.g., small project team for in-home discussion).

In addition to any verbal discussion, the project team should consider providing an individualized letter about the sampling results (see Appendix D for guidelines). Additional explanatory information (such as chemical-specific fact sheets) may also be appropriate. To reduce the communication time for the sampling results, the letter and any additional materials should be developed ahead of the sampling event. The project team should work closely with its PPS to ensure that the materials are developed in accordance with the Public Participation Manual, DTSC policies, and the established Community Relations Plan. The materials should address any specific concerns of the property owners and building occupants.

Depending on the indoor air sampling results, the contingency plan included in the work plan may need to be implemented. If the contingency plan is implemented, the project team should work closely with the PPS to anticipate and answer questions or concerns. As discussed in Section 5.4.1, the project team should have identified the outreach activities associated with the contingency plan as part of its development. Hence, at this point, the project team can simply implement the pre-planned outreach activities, as applicable.

5.6 VAPOR INTRUSION MITIGATION AT BUILDINGS (STEP 11)

When vapor intrusion mitigation becomes necessary, the project team will need to work with the owners and occupants of existing, affected buildings during the vapor intrusion mitigation system selection, design, and installation process.[10] Public outreach will also be necessary for future buildings constructed in areas with vapor intrusion concerns. In addition, the vapor intrusion mitigation systems may need to operate for an extended time while the subsurface source of the volatile chemicals is remediated. While the

[10] Please refer to DTSC's VIMA for a discussion of vapor intrusion mitigation methods.

system is operating and associated monitoring is being performed, outreach activities will need to continue.

5.6.1 Vapor Intrusion Mitigation System Selection

Property owners and building occupants should be included in the process of evaluating and selecting a vapor intrusion mitigation system for their building. During this process, it is important to convey the mitigation options and any related long-term requirements (see Sections 5.6.5 and 5.6.6). Meetings with occupants and focus groups can be useful methods of gathering input and can serve as a forum for answering questions. A follow-up fact sheet may be useful for outlining the process for selecting the mitigation approach and describing various mitigation options (see example in Appendix E). Section 3.5 identifies other possible outreach approaches. In addition, mandated public participation activities may be required in conjunction with selection of the vapor intrusion mitigation system (see Chapter 5 of DTSC's VIMA and the Public Participation Manual for further discussion).

5.6.2 Vapor Intrusion Mitigation System Design

Once a vapor intrusion mitigation system is selected, the DTSC project team should meet with property owners and building occupants to discuss the system (e.g., type, physical configuration, performance characteristics, noise, power source), where it might be located, and how long the system is expected to be in operation. To the extent possible, input from property owners and building occupants should be considered in the ultimate vapor intrusion mitigation system design and in the associated O&M requirements. For example, they may have input on where the above-ground system components are located in the building or the appearance of these features on the building exterior. The project team should provide appropriate follow-up materials to ensure that property owners and building occupants understand how the system will look in their residence or building.

5.6.3 Vapor Intrusion Mitigation System Installation in Existing Buildings

Vapor intrusion mitigation system installation may disrupt and inconvenience building occupants, and may require temporary relocation (see Section 5.2). The project team should have one-on-one discussions with the property owners and building occupants to ensure that they understand the installation process and logistics. This dialogue will help ensure that their needs and preferences are accommodated as much as possible.

After the vapor intrusion mitigation system is installed, the project team should meet with the property owners and building occupants to answer any questions they may have and to provide an information packet such as the following:

- description of vapor intrusion mitigation system and its basic operating principles
- checklist that can be used by the property owners and building occupants to ensure that the vapor intrusion mitigation system is operating properly
- identification and contact information of individuals responsible for system operation

- a list of actions to take if the system warning device or indicator degrades or fails
- information about the potential risk posed to the occupants between the time that the vapor intrusion mitigation system becomes non-operational and until it is repaired
- contact information for comments or concerns

5.6.4 Vapor Intrusion Mitigation Systems for Future Buildings

As discussed in the VIMA, mitigation for future buildings may be proposed to allow site development ahead of the completion of any required remediation activities. Although mitigation for future buildings may be less complicated (as it does not involve any building occupants), public participation issues still need to be addressed. For example, if the final remedy required for the property includes a Land Use Covenant (LUC), any restrictions on the land use and other requirements of the LUC should be discussed with the prospective buyers of the property and new building occupants (see Section 5.6.7). A public workshop or public meeting may be an effective forum for discussing the proposed mitigation and any required LUC, and to gather input and answer questions. The project team should have on-going communications with the responsible parties, project proponents, property owners, prospective building occupants, community members, and local agencies regarding the building mitigation requirements.

5.6.5 Operation and Maintenance of Vapor Intrusion Mitigation Systems

A vapor intrusion mitigation system may have to operate for years before the source of the contamination is remediated and thus can require on-going O&M, long-term monitoring (see Section 5.6.6), and on-going access. The O&M requirements for a vapor intrusion mitigation system are typically included in an O&M plan (see the VIMA for further discussion) and need to be periodically discussed with the property owners and building occupants. The project team may need to periodically update or re-provide the information packet described in Section 5.6.3 or to provide the packet to new building occupants. Mechanisms should be established for reliable, regular and continued communication with the building occupants and property owners to ensure that they have a consistent point of contact at DTSC for the duration of the O&M activities. See Section 3.5 for further discussion.

5.6.6 Long-Term Monitoring

When monitoring is required as part of the O&M plan, the property owner and building occupants should receive the results on a regular, predetermined schedule. The project team should provide the monitoring data in an easily understandable format and should develop the content, format, and distribution mechanism for monitoring data with input from the building occupants and property owners. Once developed, the reporting format and content should be included in the O&M plan. Consistent concentration units should be used in the monitoring reports.

Presentation formats for monitoring data may include:

- graphical presentation of data in charts and plots, indicating the remediation progress and mitigation system performance
- presentation of data in tabular format
- clear and concise summaries of the information (i.e., understandable to the general public)

The formats should also accommodate privacy concerns (see Section 3.11).

5.6.7 Outreach to Prospective Buyers and New Occupants

The project team should inform new members of the community about the vapor intrusion concerns and where building mitigation has been, or is required to be, implemented. Outreach efforts should reach individuals who may purchase, or have just purchased, properties or buildings known or suspected to be impacted by the subsurface contamination. For example, a new occupant may present an opportunity to assess buildings not previously sampled because the previous owner refused access. The team should determine the extent of these efforts based on the specific circumstances of the project.

Examples of outreach efforts may include one or more of the following:

- Providing information regarding any restrictions on the land use and other requirements of the LUC (see VIMA Section 7.2.4), where to find a copy of any required LUC for the property, and the regulatory agency contacts.
- Direct mailing to prospective buyers of the property and new building occupants to provide general information, most recent fact sheets, location of additional information (repositories, web address, etc.), and regulatory agency contact information.
- Visits to new property owners and new building occupants to provide an information packet (see Section 5.6.3), answer questions, and make access agreements. These visits may be combined with the routine site inspections to the extent feasible.

If a LUC is required for the property, the LUC would require the owners and occupants to provide access for any inspection, O&M, monitoring and other activities deemed necessary by DTSC.

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APPENDIX A. INITIAL CONTACT MATERIALS

Example Fact Sheet: Investigation Findings

Sample Fact Sheet: Site History

Example Fact Sheet: Initial Off-Site Investigation

Example Work Notice

Example Fact Sheet: On-going Investigation with Vapor Intrusion Concerns

Sample Fact Sheet: Vapor Intrusion

Sample Fact Sheet: Tetrachloroethlyene

Guidelines for Access Agreements

Fact Sheet, March 4, 2010

GROUNDWATER AND SOIL CONTAMINATION LOCATED AT NAVAL BASE POINT LOMA, OLD TOWN CAMPUS

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

Si desea información en español, comuníquese con Jeanne Garcia al (818) 717-6573

The Department of Toxic Substances Control (DTSC) is issuing this fact sheet to inform the community about groundwater and soil contamination located at the Old Town Campus facility (Facility). The 60-acre Facility is located at 4297 Pacific Highway, alongside the Interstate 5 Freeway approximately three miles north of the San Diego International Airport. The Facility is part of Naval Base Point Loma, and is a government-owned and contractor-operated facility currently used by Lockheed-Martin and the Navy. Previous operations included aircraft, rocket, and missile assembly and manufacturing.

As part of an ongoing investigation and cleanup process being conducted by the Navy, of which DTSC is a participating lead state agency, very high concentrations of volatile organic chemicals (VOCs) were found in groundwater and in soil gas in the northern portion of the Facility. Lower levels of the contamination have moved beyond the Facility boundaries and may have reached adjacent properties beyond Pacific Coast Highway. The VOCs found include trichloroethylene (TCE), tetrachloroethylene (PCE), and vinyl chloride (VC). These three chemicals are all classified as causing cancer. The State of California and the U.S. EPA regard vinyl chloride as a known human carcinogen (cancer causing agent).

These VOCs are able to move in the environment, from soil to groundwater, from groundwater to soil and from groundwater or soil to air. The shallow groundwater in this area is not used for drinking water or other household/industrial purposes. Of particular concern is the potential movement of VOCs into the inside of buildings where people could be exposed to contaminated indoor air. This process is called vapor intrusion into indoor air.

DTSC is working with the Navy to determine whether there is a potential current or future potential health risk to people who may be exposed by any means to any chemicals at the Facility and the properties in the vicinity.

To evaluate whether there is vapor intrusion of the VOCs into properties in the vicinity, in January 2010, DTSC conducted indoor air quality monitoring at office buildings adjacent to the Facility. Preliminary results indicate no acute air quality hazard. The Navy recently also conducted preliminary indoor air monitoring in a Navy building at the Facility. Trace levels of TCE were detected from the indoor air samples collected at the Facility.

The DTSC will conduct additional air sampling and monitoring as required. The Navy will also conduct additional indoor air sampling as part of an upcoming investigation.

Both DTSC and the Navy are concerned with the elevated concentrations of VOCs in this area. The Navy has proposed steps to reduce the concentrations of VOCs in soil gas. DTSC supports this proposal, as well as further steps to:

(1) Reduce the concentrations of VOCs in ground water and soil gas;

(2) Identify the extent of the groundwater contamination and the extent of the soil gas contamination;

(3) Conduct indoor air sampling where required; and

(4) Ensure that no one is harmed from exposure to contaminants.

FOR MORE INFORMATION

Where to find documents relating to this issue

Documents for the Facility are available for public review at the following locations:

Point Loma Branch Library (Hervey Library)
Reference Desk
3701 Voltaire Street,
San Diego, CA 92106
Phone: (619) 531-1539

DTSC's EnviroStor website at
www.envirostor.dtsc.ca.gov/public/

Who to contact for further information

The following DTSC and Navy contacts are available to answer your questions and concerns:

Alan Hsu, DTSC
Remedial Project Manager
5796 Corporate Avenue
Cypress, CA 90630
(714) 484-5395
ahsu@dtsc.ca.gov

Allison Basche, Navy
Remedial Project Manager
(619) 556-0193
allison.basche@navy.mil

Tim Chauvel, DTSC
Public Participation Specialist
(714) 484-5487, or (toll free) (866) 495-5651, choose option "4" and press 2.
tchauvel@dtsc.ca.gov

Sandra Friedman, DTSC
Public Information Officer (Media inquiries)
(714) 484-5383
sfriedma@dtsc.ca.gov

Notice to Hearing-Impaired Individuals

You can obtain additional information about the site by using the California State Relay Service at 1 (888) 877-5379 (TDD). Ask them to contact Tim Chauvel at (714) 484-5487 regarding the Naval Base Point Loma, SPAWAR/OTC.

For more information about DTSC

Visit our website at www.dtsc.ca.gov

For more information about the Navy

For general information regarding the Navy's Installation Restoration Program at Naval Base Point Loma, please contact the Navy point of contact above for information regarding the Naval Base Point Loma Restoration Advisory Board.

Sample Fact Sheet, March 2012

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

[SITE NAME, LOCATION]

[MONTH / YEAR] UPDATE

INTRODUCTION

The Department of Toxic Substances Control (DTSC) continues to oversee soil, soil gas, and groundwater investigations for the [site name] located in [location]. The purpose of the investigation is to find the nature and extent of on-site and off-site contamination. This fact sheet contains information concerning site background, results of recent investigation activities, planned investigation activities, and information contacts.

SITE BACKGROUND

The [site name] is located in a commercial and residential area at [address] (see Figure 1). [Entity] has owned and operated the [site name] since [year] and primarily used the site for [description of activities]. In [month and year], [entity] entered into a [type of agreement] with DTSC that committed [entity] to a site investigation and cleanup with DTSC oversight at [site name]. The [agreement type] outlines a series of investigations to evaluate the type and extent of chemical contamination in soil, soil gas (vapor found in soil), and groundwater both on and off the site. Subsurface investigations conducted on-site between [years] discovered that a number of [chemicals types] leaked into soil and groundwater from [source areas]. Please review a map of the site in Figure 1.

RECENT INVESTIGATION ACTIVITIES

In [month / year], [entity] completed an investigation to see if site contaminants have migrated off-site to the [direction]. Measurements of soil gas concentrations obtained at depths of [#] feet below ground surface within the local streets indicate that contaminants are present in shallow soil gas in the [name of neighborhood] to the [direction].

PLANNED INVESTIGATION ACTIVITIES

DTSC has found that the concentrations of contaminants in soil gas need further study to see if these contaminants have gone beneath nearby homes and businesses and thus could potentially degrade indoor air quality. Workers will collect samples beneath the building slab foundations (referred to as subslab samples see enclosed fact sheet for further information). The subslab sampling results will allow DTSC to better assess the potential health risks to [insert appropriate term, e.g., residents, building occupants].

DTSC CONTACTS

[Names, titles, contact information]

Figure 1. Example Site Location and Feature Map.

May 2004

Example Fact Sheet

Wyle Laboratories, Inc.
Norco, California

Sampling Near Northwestern Boundary

DTSC is one of six Boards and Departments within the California Environmental Protection Agency. The Department's mission is to restore, protect and enhance environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Why we've prepared this information packet

As you are aware, the California Department of Toxic Substances Control (DTSC) is the lead agency overseeing the environmental investigation and cleanup at Wyle Laboratories (Wyle), located at 1841 Hillside Avenue in Norco, California. On Thursday, May 6, 2004, we notified you that based on preliminary soil gas and groundwater sampling results taken on the boundary of Wyle, we wanted to take additional soil gas samples along Golden West Lane. We have received preliminary results that necessitate additional soil gas samples in your neighborhood.

This fact sheet is intended to help you understand why we need to take additional samples, what the sampling will consist of, and who to contact if you have any questions. We are also planning to hold a public meeting in mid-June (location to be determined) to update the entire community. We will notify you separately once the location has been determined.

Site history and background

Wyle is a testing facility that serviced the defense, aerospace, and manufacturing industries. It consists of 429 acres of land, divided geographically into several areas. Each area typically consists of one or more small buildings, structures, and/or outdoor testing areas built for certain testing procedures and to house specific testing apparatus.

Activities at the site included the use of hazardous substances such as chlorinated solvents, petroleum hydrocarbons, explosives, and munitions residues and rocket motor fuels. These operations have resulted in the release of hazardous substances to the soil in localized areas and groundwater. The primary chemical of concern is the solvent trichloroethylene, or TCE.

Who's in charge of the Wyle site cleanup

From 1999 to mid-2003, the California Regional Water Quality Control Board -Santa Ana Region (RWQCB) was involved with limited investigations conducted at the site. The site was transferred to DTSC in mid-2003. On October 3, 2003, DTSC executed Consent Order HSA-CO 03/04-042 with Wyle and Arrow Electronics, Inc. to address surface and subsurface contamination at the site. The Order requires full site-wide characterization and remediation, if necessary.

Site boundary assessment

DTSC requested a site boundary assessment to evaluate if contaminants on the Wyle property are migrating offsite and to assess current and future risk to the surrounding community from site-related contaminants.

As part of the investigation, 76 samples were collected on the site along the north/northwestern, western, and southwestern boundaries. Figure 1 shows the sample locations.

Elevated levels of TCE were detected at only one location (ESB-34) at the northwestern corner of Wyle property.

Off-site soil gas sampling on Golden West Lane

Off-site soil gas sampling was conducted to assess if contaminants detected on Wyle property are migrating off-site; and to define the northern extent of the TCE soil vapor plume if necessary. Sixteen (16) soil gas samples were collected along Golden West Lane. Figure 2, enclosed herein is an aerial photo which shows the approximate sampling locations and preliminary sampling results.

TCE was detected in three locations (ESG-5, ESG-6, and ESG-7) above a preliminary screening level of 100 µg/L.

No immediate health risk along Golden West Lane

The TCE concentrations detected in the soil gas along Golden West Lane do not pose an immediate threat to human health. The maximum concentration detected is 350 µg/L. Concentrations of TCE would have to reach a level above 10,700 µg/L to pose an immediate risk to health.

Additional soil gas sampling planned for selected residential properties on Golden West Lane

DTSC is requiring additional soil gas sampling on select residential properties along Golden West Lane in proximity to areas where the 100 µg/L screening level for TCE was exceeded. The screening level refers to a value above which further assessment is needed due to potential concerns from long term exposure.

Wyle is seeking authorization from homeowners to obtain access to properties where sampling is required. Enclosed is the authorization request form from Wyle. DTSC anticipates sampling in mid – June. This is contingent upon the receipt of signed property access authorization forms.

How soil gas sampling works

Soil gas sampling is a tool used to help detect areas where volatile organic compounds were spilled or spread out from a spill area. Soil gas is the air in the tiny spaces between the soil particles. When spilled on the soil surface, volatile organic compounds (such as TCE) tend to move down into the soil, slowly vaporize from the liquid state into gas, and spread through the tiny spaces in soil. Sample collection for soil gas involves getting a sample of the gas spread among the soil particles.

Soil gas sampling equipment used

Soil gas sampling uses a truck-mounted rig, or smaller limited access equipment to hydraulically push or hammer a 2-inch tube into to the ground to create a small-diameter hole. The hole is fitted with a tube, partially filled with sand and sealed with cement. The sampling process does not generate a significant amount of dust. A syringe is used to collect the air sample from the tube. The air in the filled syringe is analyzed by a mobile lab parked on the street following procedures developed by DTSC and the U.S. Environmental Protection Agency. Every reasonable effort to return the property to the condition it was in prior to sampling will be made.

Where you can get more information about the site

Copies of the Wyle site-related documents are available for review at the following locations:

Norco City Hall
2870 Clark Avenue
Norco, California
Corona Library
650 South Main Street
Corona, California

Dept of Toxic Substances Control
5796 Corporate Avenue
Cypress, California
714-484-5300
Call Ms. Julie Johnson to make an appointment.

DTSC contacts

Should you have any questions, please contact:

Mr. Derrick Alatorre
Public Participation Specialist
714-484-5474
e-mail: dalatorr@dtsc.ca.gov

Mr. Shahir Haddad
Project Manager
714-484-5368
email: shaddad@dtsc.ca.gov

Media inquiries

Ms. Jeanne Garcia
Public Information Officer
818-551-2176
email: jgarcia1@dtsc.ca.gov

Community Advisory Group

A community advisory group (CAG) has been formed to advise DTSC on community concerns. The CAG invites citizen participation so that questions or concerns regarding any aspect of the contamination problems - past, present or future - may be addressed; and encourages local associations and community groups to invite CAG representatives to its meetings.

For further information, please contact Dr. Jeanne Guertin, CAG Chair at: 4370 California Avenue, Norco, CA. 92860, (909) 582-9010.

Notice to the Hearing Impaired

TDD users can use the California Relay Service (1-888-877-5378) to reach DTSC Public Participation Specialist Derrick Alatorre at 714-484-5368.

DTSC website

For more information about DTSC, please visit our website at www.dtsc.ca.gov

Department of Toxic Substances Control

The Mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

California Environmental Protection Agency

Work Notice August 2008

Additional Information on the Groundwater, Soil, and Soil Gas Testing inside the Marchant Building

The Department of Toxic Substances Control (DTSC) is providing additional information on the groundwater, soil, and soil gas testing inside the Marchant building.

Drilling inside the Marchant building basement will begin on Tuesday, September 2, 2008 and will occur over a two week period.

On Saturday, September 13, 2008 drilling on the first floor of the Marchant building will begin. Work on the first floor will be completed that same day.

Current Health Risk

There is no immediate health risk to visitors and workers at the Marchant Building from the volatile organic compounds (VOCs) present in subsurface soil, groundwater, or indoor air.

- Measurements of basement indoor air, where VOCs levels were expected to be highest, showed that VOCs in basement indoor air do not exceed Cal-OSHA permissible exposure limits.
- Any potential exposure to VOCs in indoor air has been further reduced by the basement ventilation system, which has been renovated and placed back into operation. Basement air is vented directly to the outside, preventing the potential build up of contaminant vapors.
- Groundwater beneath the building is not used as a source of drinking water. Tap water in the building is supplied by East Bay Municipal Untility District (East Bay MUD). There is no risk from direct contact with the contaminated soil and contaminated groundwater which are beneath the building.

Health Risk During Soil, Groundwater, and Soil Gas Investigations

The following procedures will be implemented during the soil, groundwater, and soil gas investigations in the building to ensure that the health and safety of the building occupants are not adversely affected. The principal safety concern is the intrusion of VOC-contaminated soil vapor into indoor air.

- Air monitoring will be used to ensure safe indoor air conditions at each work location.
- Air monitoring devices will operate continuously, with readings recorded every 15 minutes. These devices provide warnings if VOC levels exceed acceptable levels.
- If unacceptable levels of VOCs are detected in indoor air at a work location, steps will be taken to restore the indoor air conditions to acceptable levels and to ensure

that the health and safety of the building occupants and workers are not adversely affected (e.g., by stopping work, ventilating the area to dissipate vapors, monitoring air on the next upper floor).

- Borings in the basement and on the first floor will be properly resealed.

Groundwater, Soil, and Soil Gas Testing Activities

Testing in the Basement of Marchant Building

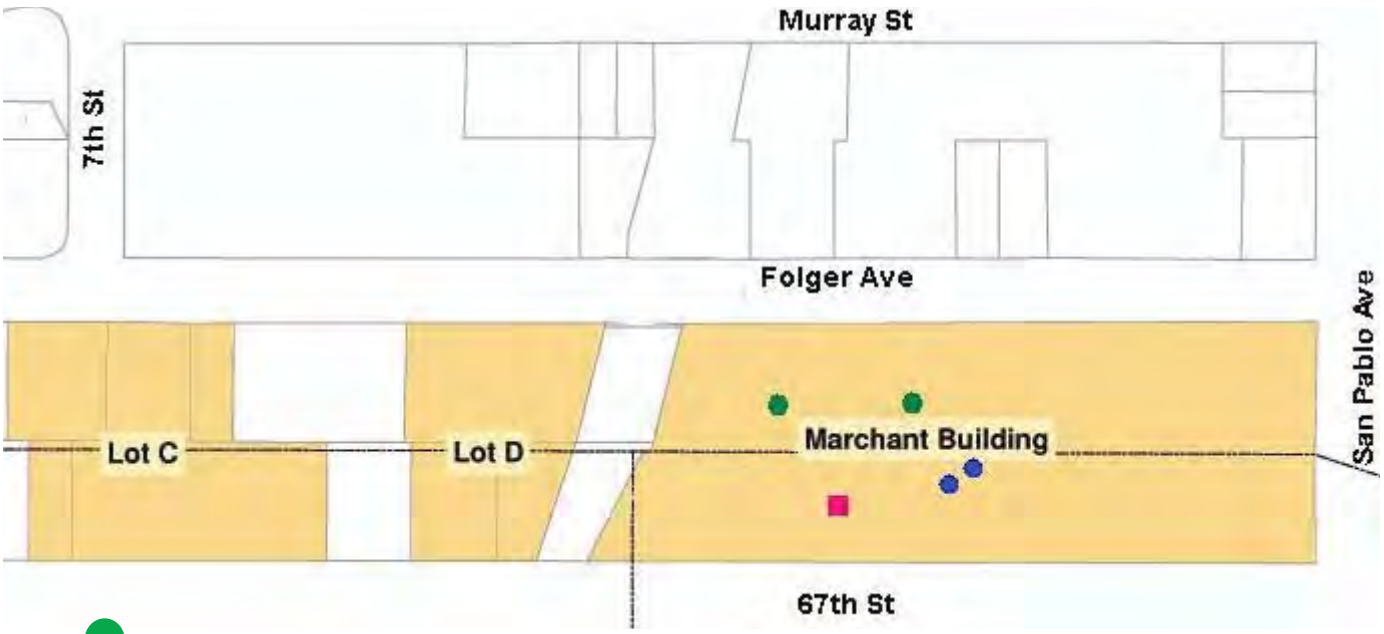
- Work in the basement will begin Tuesday, September 2, 2008
- The basement drilling equipment will be brought in through the southwest basement entrance
- Drilling will occur in 3 locations in the basement (see map)
- The drill holes in the basement will be 4 to 10 inches in diameter; groundwater and soil samples will be taken from these drill holes.
- A groundwater monitoring well will be installed at one of the drill holes. The well head will be properly sealed to prevent vapor intrusion

Testing on first floor of Marchant Building

- Work on the first floor will take place on Saturday, September 13, 2008
- The drilling equipment will consist of a manual hand held drill
- Drilling will occur in 2 locations on the first floor (see map)
- The drill holes on the first floor will be 3 ¼ inch in diameter
- Soil gas samples will be taken from these drill holes using a sealed collection system.

Results Will Be Available

DTSC will make sampling results available to the public after laboratory analysis is conducted and a final report is completed. The sampling results and final report will be available at the information repositories listed on the next page.



Identifies the location of the first floor soil gas sampling

Identifies the location of the basement soil and groundwater sampling

Identifies the water well location for groundwater sampling

Information Repository

The Remedial Investigation Workplan for the groundwater, soil, and soil gas testing activities is available for review at the information repositories listed below:

Golden Gate Branch Library
5606 San Pablo Avenue
Oakland, California 94608
(510) 597-5023
(Call for hours)

Department of Toxic Substances Control
File Room
700 Heinz Avenue
Berkeley, California 94710
(510) 540-3800
(Call for appointment)

The Remedial Investigation Workplan and other site-related documents are also available online at DTSC's EnviroStor website: www.envirostor.dtsc.ca.gov/public/. Enter "Berkeley" as the City then click "Get Report." Find the "Marchant Corporation Site" then click on the "Report" link next to the site name.

For More Information

If you have any questions or would like additional information regarding the groundwater, soil, and soil gas activities and schedule, please contact: Allan Fone, DTSC Project Manager, at (510) 540-3836 or by e-mail to AFone@dtsc.ca.gov.

For public participation questions, please contact: Chao Thao, DTSC Public Participation Specialist, at (916) 255-3649 or toll-free at (866) 495-5651 or by e-mail to CThao@dtsc.ca.gov.

Members of the media should contact: Claudia Loomis, DTSC Public Information Officer, at (916) 255-6578 or by e-mail to CLoomis@dtsc.ca.gov.

Si prefiere hablar con alguien en español acerca de ésta información, favor de llamar a Jacinto Soto, Departamento de Control de Substancies Tóxicas. El número de teléfono es (510) 540-3842.

如閣下對此清理計劃有疑問, 請致電DTSC 職員 Henry Wong 黃先生, (510) 540-3770.

Department of Toxic Substances Control

Preventing environmental damage from hazardous waste, and restoring contaminated sites for all Californians.

State of California

California Environmental Protection Agency

Fact Sheet, August 2006

Soil Gas and Indoor Air Sampling to be Conducted Related to Bonnie Beach Facility

We want to let you know that during the month of September 2006, the Department of Toxics Substances Control (DTSC) will be supervising sampling of soil gas otherwise known as vapors within the soil and conducting indoor air sampling in the vicinity of South Bonnie Beach Place. This sampling is part of DTSC's investigation of the contamination found at and around the former Univar Bonnie Beach facility (BBF) located at 1363 S. Bonnie Beach Place (the facility) in Los Angeles, California. This is a follow-up of the soil gas investigation that took place in 2004.

The sampling that was conducted before was within the public right-of-ways. The investigation found high levels of volatile organic compounds (VOCs) in the soil gas that extend beyond the facility property. VOCs are chemicals that contain carbon and evaporate easily at room temperature. Products that contain VOCs include paint, cleaning chemicals, and vehicle exhaust. The highest VOC concentrations were detected onsite, near the south portion of the facility and to the east of the facility along South Bonnie Beach Place.

DTSC and Univar are working cooperatively to collect additional sampling in the area where high concentrations of chemicals were found. The purpose of the additional sampling is to determine how far these chemicals have migrated from the facility. Additional soil gas sampling will be done in the yards of the residential homes and commercial buildings. Also, DTSC plans to conduct indoor air sampling

DO YOU HAVE A WELL?

DTSC needs to be aware of all wells in the vicinity to insure protection of the groundwater.

If you do please contact Yolanda Garza at (818) 551-2955.

Community Outreach

We encourage community involvement and will publish additional fact sheets as significant milestones are reached. After the additional sampling is completed, DTSC will mail out another fact sheet or information letter letting you know of the sampling results and further actions.

in selected homes and commercial buildings near the facility. Prior to any indoor air sampling, the residents of these homes will be contacted individually by DTSC staff to obtain access from the residents and to explain procedures. The Univar Consultant, Rubicon Engineering Corporation will conduct the indoor air sampling with DTSC oversight. The additional sampling will be conducted at the facility and in the immediate vicinity to the east.

Our agency is the Department of Toxic Substances Control. Our mission is to protect human health and the environment by overseeing the investigation and cleanup of the facility.

Facility History and Investigations

The Bonnie Beach Facility (BBF) is located on the border of Commerce and Los Angeles in California. The facility covers approximately 8 acres in a mixed industrial, commercial, and residential area. Univar had been the owner of the BBF from 1958 until 2003 and operated the BBF until December 2000. The BBF had been used for the blending and distribution of various chemicals. Between 1971 and 1985, a portion of the BBF was used for recycling industrial solvents.

Underground investigations conducted between 1986 and 1990 discovered that a number of solvents at the BBF leaked into the soil beneath the recycle facility area and the former underground storage tanks (USTs). The USTs were removed in 2001.

In June 1995, Van Waters and Rogers Inc. (now Univar USA Inc.) entered into a consent agreement with DTSC. The agreement committed Univar USA, Inc. to a hazardous waste investigation and cleanup at the BBF with DTSC oversight. The agreement outlines a series of investigations to evaluate the type and extent of chemical contamination of soil and groundwater onsite and offsite.

A Phase I investigation conducted in late 1995 and early 1996 confirmed the presence of solvents in soil in the former recycle area and around the former USTs, and identified solvents in ground water. Additional data was needed and from November 1996 to April 1997, Phase II of the facility investigation was performed, which included collecting soil, soil gas and ground water samples both onsite and offsite. The results of the investigation indicate that solvents are present in soil gas and groundwater beneath the facility and offsite.

Phase III investigations began in December 1997 and focused on assessing the presence of vapors in soil gas beneath the BBF warehouse and evaluating the presence of solvents in deeper zones. Phase IV investigation conducted in late 1999 through 2002 included further evaluation of solvents and hydrogeologic conditions in the shallow and intermediate groundwater zones in offsite, down gradient (lower) areas. Results of the investigations to date indicate contamination has extended offsite and DTSC has determined that additional investigations were necessary to determine the extent of offsite soil gas contamination.

In December 2000, all operations ceased at the BBF. Since then, the northern portion of the facility has been purchased and is being used as a warehouse. Currently, soil and groundwater investigation and remediation are ongoing activities at the facility. In 2004, DTSC conducted soil gas investigations at the facility and in the immediate vicinity to the east, west and southeast to further evaluate subsurface conditions.

What is Being Done Now

To reduce potential soil gas contamination from the facility, a soil vapor extraction treatment (SVET) system has been installed at the facility to remove chemical vapors from the soil. The extracted soil vapors are treated by a catalytic oxidizer that reduces the chemicals to carbon dioxide, water and a small amount of sodium chloride (table salt) and sodium bicarbonate (baking soda).

The SVET system is intended to remediate the deeper zones of soils beneath the former underground storage tank (USTs) area and southern portions of the facility. In addition, soil vapor extraction, with vapor treatment by a

carbon absorption system is installed to clean up the shallow soils surrounding the former USTs.

The SVET system has been installed by Univar under DTSC oversight and has been operating under a permit issued by the South Coast Air Quality Management District (SCAQMD). The SVET system will be maintained and operated until soil gas vapors are reduced to an acceptable level.

Corrective Measures Study and Remedy Selection

The facility investigations are being performed in accordance with the federal Resource Conservation and Recovery Act (RCRA). The results of the investigations, called the RCRA Facility Investigation (RFI), will be used to determine the different ways cleanup of the contamination can be achieved. This is reported in a document called a Corrective Measures Study (CMS). This CMS will form the basis for selecting the final cleanup for the facility.

After the RFI is complete and DTSC has defined the full extent of the contamination, Univar will prepare a CMS. In the CMS, different cleanup remedies are identified and evaluated, and DTSC will recommend the best cleanup remedy. DTSC will present the draft CMS document for public review and comment. The final remedy selection process is also subject to the California Environmental Quality Act (CEQA). CEQA requires DTSC to report to the public any impacts to public health or the environment that could occur from the cleanup. A draft CEQA determination will also be provided to the public for review and comment.

DTSC will review and respond to all public comments in writing and will send a copy of the response and comments to all persons who submitted comments and to those who request a copy. After responding to public comments and if necessary DTSC may revise the CMS before finalizing the remedy selection. Once the remedy selection is finalized, a final cleanup plan will be prepared and implemented. Future fact sheets will serve to inform the community of the plan's implementation and the progress of the final remedy.

Who to Contact for More Information

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Glendale, California 91201
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For media inquiries

Jeanne Garcia
DTSC Public Information Officer
Phone: (818) 551-2176
E-mail: jgarcia1@dtsc.ca.gov

Where to Find the Documents

You can get more information about the project at the local library. You can find details about the indoor air sampling and analysis plan (SAP) as well as other documents pertaining to the RFI. The libraries are at the following locations:

Bristow Public Library
1466 S. McDonnell Avenue
Commerce, CA 90040
Phone: (323) 265-1787
Hours: 2 p.m.- 8 p.m. Mon. & Tues.
1 p.m.- 8 p.m. Wed. & Thur.
2 p.m. - 6 p.m. Friday

Our Lady of Victory Church
Rectory Office
1316 S. Herbert Avenue
Los Angeles, CA 90023
Phone: (323) 268-9502

Department of Toxic Substances Control
Regional Records Office
1011 N. Grandview Avenue
Glendale, CA 91201
Contact: Jone Barrio
Phone: (818) 551-2886
Hours: 8 a.m.-5 p.m. Mon-Fri

Notice to Hearing-Impaired Individuals

You can obtain additional information about the site by using the California State Relay Service at (888) 877-5378 (TDD) or by calling Treva Miller, DTSC Public Participation Specialist, at (818) 551-2846.

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

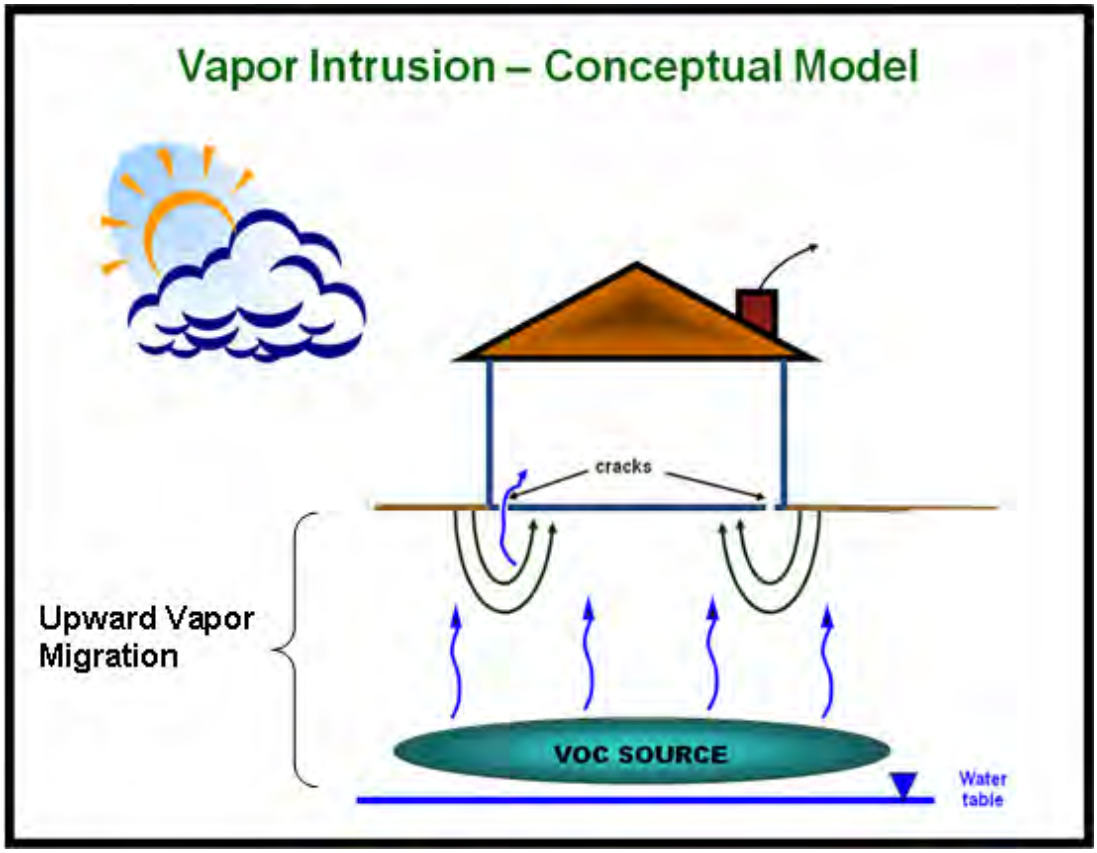
The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

Vapor Intrusion

A. What is Vapor Intrusion: Vapor intrusion is a term used to describe a below ground source of indoor air pollution in which vapors enter people's homes or businesses through cracks or other openings in the foundation such as those for piping (e.g., plumbing and sewer lines) and electrical conduits. Concentrations of volatile chemicals may reach levels that become a health concern if people inhale them for many years.



B. What is the Department of Toxic Substances Control (DTSC)? The DTSC is a State of California Agency charged with ensuring that pollution released into the ground is cleaned up to a level where there will be no real risks to the people of California. In some cases where there is significant groundwater contamination, one of the State Regional Water Quality Control Boards may be the lead California state agency.

C. Air pollution, both indoor and outdoor are health concerns: Most people have some awareness of the problem of air pollution released from industry, power plants and tailpipe emissions from vehicles. The chemicals released from all these sources put people at increased risk of health effects from long-term exposure (such as cancer, heart disease and asthma). Over several decades, federal and state government agencies have had ongoing efforts to improve air quality by controlling the sources of the pollution. Agencies such as the California Air Resources Board (CARB) and Air Quality Management Districts (AQMDs) regulate sources of outdoor air pollution. The DTSC does not regulate this type of pollution.

People are less aware of the issue of indoor air pollution, which can also contribute to increased health risks. Sources of indoor air pollution include:

1) the same outdoor air pollution from vehicles and industry which also enters buildings.

2) common household items which can slowly release gases into air, such as cleaning solvents and lubricants, dry cleaned clothes, building materials, and some plastic products.

3) soil and groundwater contaminated by human activities

4) rarely, natural sources in the ground such as petroleum deposits which are found in many places in California. Even rarer in California although more common in other places in the United States is the occurrence of radon, a radioactive gas which is produced by the radioactive decay of natural deposits of uranium found in some soil.

D. Common Sources of Human Caused Vapor Intrusion: The most common sources of vapor intrusion are volatile chemicals, commonly referred to as volatile organic compounds or VOCs. VOCs may be released from a variety of industries, leaking landfills, leaking underground storage tanks at gas stations and dry cleaners.

The two most common categories of VOCs are:

1) A mixture of chemicals in petroleum products including gasoline and diesel fuel.

2) A class of volatile chemicals that are known as chlorinated VOCs. These chemicals are most often solvents used for removing oil and grease from metal such as during the manufacturing of a variety of machined products. This type of chemical is also used in dry cleaning. Use of many of these chlorinated VOCs have already been or are currently being discontinued because of environmental concerns. However, these chemicals have already released into the environment and can remain for many decades providing a possible source of vapor intrusion. The two most common chlorinated VOCs that are encountered are tetrachloroethylene (also known as perchloroethylene or PCE) and trichloroethylene (TCE).

E. VOCs that are common vapor intrusion problems and their potential health effects

Benzene: Benzene is naturally occurring and found in crude oil and refined petroleum products like gasoline. Found everywhere in urban air, benzene is a major source of increased cancer risks for both outdoor and indoor air pollution. Benzene is known to cause some cancers in people. Workers exposed to high amounts of benzene have increased risks of acute myeloid leukemia and leukemia-related blood disorders; other cancer types may also be elevated. Benzene may be a possible vapor intrusion problem associated with contaminated soil and groundwater from releases from petroleum refineries and from leaking storage tanks at gas stations. Benzene is broken down by bacteria in soil, detoxifying the chemical. However in some locations, the amount of benzene may be very high or the type of bacteria which may break down benzene may not be able to thrive. In such cases the benzene contamination of soil and groundwater may be a long-term source of health risks.

Tetrachloroethylene (PCE) and Trichloroethylene (TCE): PCE is a chemical that is still used in dry cleaning. PCE and the closely related chemical TCE are still used in some applications for cleaning metal parts. Both chemicals are considered by the State of California as probable human carcinogens, based mostly upon observations of the cancer-causing effects on animals and understanding that the chemical is similarly metabolized in humans. Although many workers and some communities have been exposed to elevated levels of these chemicals, the evidence is not clear as to whether these populations have higher rates of cancers.

Vinyl Chloride: Vinyl chloride is a chemical that can be released as a vapor from plastic products such as polyvinyl chloride (PVC), also known as off-gassing. In the environment, vinyl chloride results from the breakdown of PCE and TCE and therefore may be an important source of vapor intrusion health risks. Vinyl chloride may form and also be rapidly detoxified by bacteria in soil and groundwater. Under some conditions, vinyl chloride can form and exist long enough in the ground to pose a VI risk. Vinyl chloride is a known human carcinogen. Workers exposed to high amounts of vinyl chloride have elevated risks of a rare liver tumor known as angiosarcoma, and possibly other types of cancer.

Other health effects besides cancer risks: Besides the increased risks of cancer, the above-mentioned chemicals as well as other VOCs not discussed here may have health effects in which specific organ systems may be damaged. However, it is important to understand that these health effects require exposure to much higher concentrations that are typically associated with vapor intrusion and are therefore are less likely to be the major health risk concern for vapor intrusion. For solvent vapors, the most common target is the central nervous system. For example, many people have experienced the short-term effects such as headaches and dizziness after inhaling gasoline vapors. Because many solvents are metabolized in the liver and kidney, these organs are common targets for toxicity. The amount of VOCs which are needed to produce these non-cancer health effects, especially the short-term health effects, are hundreds and thousands of times higher than the amounts which are thought to lead to a very small but still relevant increased risk of acquiring cancer in one's lifetime.

F. How does the DTSC determine if there is VI in your home or business? The first step is to identify whether there has been a release of chemicals into the soil or groundwater from a responsible party (e.g., an industry or dry cleaner). The soil, groundwater and the gas in the small air spaces in the soil (soil gas) will be measured to determine whether these chemicals are at high enough levels to potentially impact indoor air. If a source of possible vapor intrusion is found, soil gas immediately under the foundation of your home and the air inside your home may be sampled to measure the concentrations and determine 1) whether they are from the subsurface; and 2) whether they pose a threat to the residents.

Apparatus used to sample soil gas near a building.

Summa canisters are used to collect a subslab sample (lower left) and a companion indoor air sample (center) in an office building.

G. If the chemical is found in soil, groundwater, or soil gas, are building occupants in danger of increased heath risks? Not necessarily. In many cases the soil and the building foundation can serve as barriers to vapor intrusion, although there is no way to determine this by visually examining the building. This is why we may need to measure the air in your home or business.

H. If the chemical is found in indoor air, am I in danger? Not necessarily. Many chemicals are found in indoor air at very small concentrations, which do not pose a health concern.

I. How do you know if the chemicals in indoor air came from vapor intrusion or other sources of indoor air pollution? The chemicals used in your home or business will be examined to see if they might also contain the chemicals also found below ground. The outdoor air will also be sampled to determine if the chemicals found inside your home are elevated over those found in the normal outdoor environment. This is often the case for chemicals such as benzene, which is a major air pollution problem in all urban areas.

J. If vapor intrusion is found what can be done about it? If the concentrations are found to be high enough and pose a potential indoor air risk to the occupants, modifications can be made to your home or business to prevent vapors from entering. Example modifications include sealing cracks in the foundation and pressurizing the building. Other options include placing pipes under the building to vent the soil gas before it can enter a building. In the longer term, the source of the vapor intrusion in soil and groundwater should be cleaned up. In the rare circumstances where there is a chance that there could be short-term health risks to sensitive people from very high levels, we may recommend that the building not be occupied until changes can be made to protect the occupant's health.

K. Who is responsible for paying for this work? The DTSC will identify the responsible parties to have them pay for this work. If no responsible party can be found, there are state or federal funds, which may sometimes be used, especially if the health risks are significant.

L. What if indoor air pollution is found that may pose a health risk but does not come from vapor intrusion? What will be done about it? The DTSC will inform you of what is found so that you can remove the chemical. However the DTSC does not regulate consumer products and it will be your responsibility to remove these products. If the chemicals come from outdoors, there is nothing that can be done if the air pollution is a regional problem. Outdoor air sources cannot be mitigated. In the very rare occurrence of a local industry that might be contaminating the outdoor air from their activities, the Regional Air Quality Management District will be contacted.

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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State of California

Cal/EPA

Sample Fact Sheet, March 2012

Tetrachloroethylene -- Vapor Intrusion Fact Sheet

A. What is tetrachloroethylene and why is it a concern for the environment?

Tetrachloroethylene is a man-made chemical solvent typically used for dry cleaning clothes and for cleaning metal parts in manufacturing. It is also used to make other chemicals and may be found in small amounts in some consumer products. Other names for tetrachloroethylene include PCE, perchloroethylene, PERC, and tetrachloroethene. Like all solvents, it is a liquid but evaporates quickly. When spilled onto the ground it can soak into the ground and make its way to groundwater through the small pores in the soil. In rare instances where groundwater comes back up to the surface, it can also impact surface water such as streams or lakes. More commonly PCE evaporates underground and makes its way back up to the surface in vapor form and passes into buildings where it may be a source of indoor air pollution. This process of vapors moving from the subsurface and entering into buildings is called vapor intrusion.

B. How are people exposed to tetrachloroethylene?

PCE has been measured in outdoor air, in drinking water, and in food. Most people are exposed through air and drinking water. While the levels in air have decreased greatly as the regulation of PCE and phase-out of some uses of PCE has been occurring, concentrations in outdoor air are still measurable. In most locations the levels are very low. Statewide measurements from an air monitoring network in 2010 (the most recent data available) reported a median concentration of 0.03 parts per billion, with measurements of 0.17 parts per billion or less. It is likely that at some locations near businesses that still use PCE, the levels may be higher. PCE has also contaminated shallow groundwater, and in some locations, the deep aquifers from which drinking water is withdrawn. PCE in drinking water is regulated by the state and federal governments. The maximum allowable concentration in drinking water is 5 parts per billion.

C. What should I know about tetrachloroethylene and indoor air pollution?

Most people have some awareness of the problem of outdoor air pollution, but are less aware of the issue of indoor air pollution. When solvent vapors such as PCE occur in indoor air, they can become contributors to increased health risks. Sources of PCE in indoor air include:

1) Outdoor air pollution from dry cleaners and industrial manufacturers which also enters buildings;
2) PCE in household items such as common cleaning liquids, lubricants and glues which give off vapors, and recently dry cleaned clothes; and
3) Vapor intrusion into buildings from contaminated soil and groundwater.

As discussed above, outdoor levels while measurable, are usually low (<0.17 ppb). A recent U.S. Environmental Protection Agency (US EPA) analysis of reported levels of PCE in people's homes in North America (not due to vapor intrusion) ranged between <0.002 parts per billion to over 1.4 parts per billion, with 63% of samples having some measurable concentration. The reasons for these levels include outdoor air pollution as well as the fact that some consumer products still contain PCE. A common consumer-related source of PCE is recently dry cleaned clothes, which can temporarily raise indoor air levels.

Indoor air measured in people's homes near sources of soil and groundwater contamination with PCE is usually in the same low ranges of background concentrations discussed above. In some cases the concentrations may be higher and therefore a cause for concern.

D. What are the potential health effects of breathing tetrachloroethylene?

As a rule, the health effects of any chemical vary depending upon the amount of chemical and the amount of time to which an individual may be exposed. The shorter the amount of time that an individual is exposed, the higher the concentration required to produce a toxic effect. PCE has been associated with a range of possible health effects in humans and animals when they are exposed to very high amounts of the chemical. These high amounts are likely to only be encountered when directly handling PCE in confined spaces such as in an occupational setting. In fact almost all of the information on PCE toxicity comes from studies of animals exposed to very high levels of the chemical and workers who were exposed to PCE for many years (also referred to as chronic or long-term exposures). Table-1 (see page 4) provides a list of indoor and outdoor background levels, the relevant health effect thresholds, and worker regulatory levels. The range of possible concentrations from vapor intrusion into homes near sources of environmental contamination can not be fully known. However, in the large majority of cases, levels are usually near background concentrations.

D. Potential health effects of breathing tetrachloroethylene *(Continued)*

At the very low amounts typically observed in outdoor or indoor air, the only health concern is potential cancer risks from very long-term exposure. The State of California has determined that if one million people were exposed to 0.1 ppb for 30 years, one person may get cancer due to the PCE exposure. In other words, the probability of getting cancer is one-in-one-million, which is considered negligible by DTSC. In the large majority of cases, regulatory decisions will be based upon a comparison with background levels and the potential increased cancer risks.

At higher levels the main non-cancer health concerns are neurological effects on vision, muscle coordination, and reaction time. The minimum risk level (MRL) for exposure periods of longer than one-year is 40 ppb of PCE in air. This MRL is based upon these possible neurological effects. The MRL for exposure periods of less than one-year (also referred to as a short-term or acute exposure) is a concentration of 200 ppb, and is based on concerns that some sensitive individuals might have neurological effects after only days of exposure. Rarely will levels measured in homes be as high as these health effect thresholds.

Some studies with higher concentrations of PCE suggest liver and kidney toxicity in animals and workers. There is also some evidence for reproductive toxicity such as increased risks of infertility and spontaneous abortions, although the evidence is less strong than the other toxic effects. No thresholds of concern have been established for the liver, kidney and reproductive toxicities because such thresholds would be even higher than those for the neurological effects or there is not enough scientific information to quantify the hazards.

Healthy adult individuals can tolerate relatively high levels of PCE without any obvious short-term effects. The long-term health effects from these high concentrations to which workers may be exposed are fairly subtle. The Occupational Safety and Health Administration (OSHA) 8-hour permissible exposure limit for workers handling PCE is set at 100,000 ppb, although the American Conference of Governmental Industrial Hygienists recommends a lower threshold limit value of 25,000 ppb. At very high concentrations, above the levels established to protect workers from short term exposure, PCE can cause dizziness, nausea and coordination loss, with unconsciousness at increasing concentrations. PCE is also a skin irritant from chronic occupational exposure.

TABLE-1 Comparison of PCE background concentrations, health effect thresholds and worker regulatory levels	
Concentration, Threshold, or Level	PCE Concentration in Air [1] [Parts Per Billion (ppb) in Air]
Background Concentration	
[2] One in a million cancer risk	0.1
[3] Maximum California PCE in outdoor air in 2010 from ambient air monitoring network	0.17
[4] Upper end of range (95th percentile) of PCE background concentrations in North American homes	1.4
Health Effect Threshold	
[5] Neurological effects from one year or more of exposure	40
[5] Neurological effects from short-term (days) exposure	200
Worker Regulatory Level	
[6] OSHA eight-hour permissible exposure level	100,000
[6] OSHA acceptable maximum peak concentration (for five minutes every three-hours)	300,000

[1] The units "parts per billion" (also referred to as "ppb") are only one of many ways of expressing concentrations of chemicals in air. Other ways include micrograms per cubic meter of air (written as either mcg/m^3 or μg/m^3) or micrograms per liter of air (mcg/l or μg /l). These concentrations are not equivalent, meaning that 1 ppb does not equal 1 mcg/m^3 which also does not equal 1 μg /l. If assistance is required in converting concentrations so they can be compared with those presented here in parts per billion, please contact the DTSC for assistance. The telephone number is at the end of this fact sheet.

[2] California Human Health Screening Levels for Indoor Air: http://www.oehha.ca.gov/risk/Sb32soils05.html

[3] California Air Resources Board, Annual Statewide Toxic Summary: http://www.arb.ca.gov/adam/toxics/statepages/percstate.html

[4] Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990–2005): A Compilation of Statistics for Assessing Vapor Intrusion, June 2011, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC 20460, EPA 530-R-10-0011

[5] U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels. http://www.atsdr.cdc.gov/mrls/index.asp

[6] Occupational Health and Safety Administration (OSHA) Permissible Exposure Levels: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9993

E. Should I be concerned about exposures above the thresholds?

The regulatory levels for PCE are considerably lower than the concentrations which caused the toxic effects in the studies upon which they were based. The thresholds were developed from studies where real health effects in humans or animals came about following exposure to very high concentrations. For the non-cancer health effects, safety factors of up to a 1,000 were applied to protect people that may be sensitive to chemical exposure, such as children, the elderly, or those who are ill. Exposure to PCE at the thresholds listed in Table-1 does not mean that an individual will develop health effects and is not proof that any health effect encountered by an individual is in any way associated with PCE exposure. Rather, when encountering indoor air at these concentrations, state regulators will perform additional health risk evaluations and may require that actions that reduce the PCE concentrations present in indoor air.

If you believe you or your children have symptoms caused by PCE exposure, please contact a physician. You should tell the physician about the symptoms and about the nature and duration of your exposure to PCE.

F. Where can I get more information?

If you have any questions about the information in this fact sheet or would like to know more about PCE, please contact [name and position of DTSC contact for the project] at [phone number], [e-mail address], or [mailing address].

GUIDELINES FOR ACCESS AGREEMENTS

Introduction

The following guidelines have been prepared to assist with the development of access agreements at vapor intrusion sites. There is no right or wrong way to construct an access agreement. However, the following information may help streamline the process by drawing on the experience gained on previous projects.

Purpose

The purpose of an access agreement is to provide authority to conduct activities on private property. An access agreement should be secured prior to collecting any samples on private property.

Parties to the Agreement

The parties to the access agreement will usually be some combination of the following:

- responsible party (or representative)
- property owner (and/or the lessee)
- regulatory agency

In most cases, the environmental consultant acting on behalf of the responsible party will be the lead party requesting access. However, the access agreement should include language granting access for the regulatory agency (in order to allow for oversight of the activities). In certain circumstances, the regulatory agency may act as the lead party requesting access (such as when the responsible party is either unwilling or unable to act as the lead, or when the community distrusts the responsible party). If DTSC is the lead party requesting access then the access agreement should be drafted in consultation with the Office of Legal Counsel.

In cases where DTSC is the lead because of community distrust or the request is for access into private residences or businesses for indoor air sampling, DTSC recommends arranging a meeting with the resident or business manager (whether a renter and owner) before requesting access. At a minimum, the project manager and the Public Participation Specialist should meet with the resident/owner/manager or renter. Many times, the situation will call for having a toxicologist also present. The project team should prepare prior to initiating these meetings.

When meeting with a resident or business owner, please start the meeting by listening to the person and putting yourself in their position. Build personal trust and creditability by empathizing with the residents/owners and stressing our desire to keep disruption and inconvenience to a minimum. Do expect a variety of reactions (humor, health concerns, distrust, reassurance, confusion, appreciation, sarcasm, desire for more

technical information, cost concerns, even anger and confrontation). Please do not take anything as a personal attack. Residents and or workers react in different ways based on their cultural background, personalities, previous experience with government or with other authority figures, ability to adopt to change, and so on.

Using personal pronouns makes what we say much less threatening. "We want to sample your air so we can see if there is a problem that we can resolve" is easier to hear than "DTSC intends to use this Summa canister to sample your air to see whether there is any risk to the inhabitants." All statements about the need for access need to be positive. "We want to find out what may be wrong so we can clean it up as soon as possible." Also, please use language that the resident or owner will understand clearly.

Content of the Agreement

The access agreement should include, at minimum, the following:

- property information (e.g. address and/or APN)
- purpose for which the access is being granted
- name(s) of the parties for which access is granted
- scope of the access provided (e.g. what activities are covered)
- duration or term of the agreement
- date, name (printed) and signature of property owner
- contact information (e.g. home and/or mobile telephone number)

The access agreement may include any other conditions as agreed by the parties.

Holder of the Agreement

The access agreement should be provided in duplicate so that the property owner can return one copy to the lead party requesting access and retain a copy for their records. A copy of the access agreement should be provided to the regulatory agency.

Translation

The access agreement should be translated, as appropriate, based on the community demographics and past practice for the project. However, it is important that the property owner / occupant sign an English version of the access agreement.

Monetary Compensation

In some cases monetary compensation is offered (or requested) in order to secure access. Usually when this occurs the level of compensation is limited to measurable and actual costs incurred. Some large entities (e.g., railroads) have a formal process for requesting access, including a template agreement, and may require a fee in order to process the application.

Indemnification

The property owner may request that the lead party requesting access provide indemnification against damages and liabilities resulting from access. Most governmental agencies (including DTSC) cannot agree to indemnify a property owner as a condition of access.

Denial (Refusal) of Access

The property owner may elect to deny access to the property. This is a relatively common occurrence and should be anticipated. In fact, it is good practice to include an optional section on the access agreement for the property owner to complete to signify their desire to deny access.

If access is denied, then the lead party requesting access should document the decision. The decision to deny access is adequately documented if the decline section of the access agreement was completed. Alternatively, a letter can be sent (certified mail, return receipt requested) to the property owner documenting and confirming that a request for access was made and access was not granted.

APPENDIX B. SUBSLAB SAMPLING

Sample Letter to Occupants / Owners

Sample Fact Sheet: Subslab Sampling

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

SAMPLE LETTER TO OCCUPANTS / OWNERS

[Date]

[Name]
[Address]
[City, State, Zip Code]

INVESTIGATION ACTIVITIES CONTINUE AT [SITE NAME]

Dear [Appropriate addressee (e.g., resident, occupant)]:

As you are likely aware, [entity] [will investigate, has and continues to investigate] the subsurface vapor contamination in the [community name] with oversight from the California Department of Toxic Substances Control (DTSC). Within [timeframe], a representative from [entity] will call or visit you to invite your participation in a subslab sampling program.

[Entity] appreciates and needs your voluntary participation to prepare an accurate assessment of contaminant concentrations beneath your [residence or building]. We are planning to visit [#] residences and businesses in your neighborhood, including yours, beneath which we will collect subslab samples. Subslab sampling is planned for [month, year].

If you agree to participate, we will schedule a convenient time to conduct four visits to your home or business. The first visit will allow us to work with you to identify the best sampling locations. The second visit will allow us to install the sampling equipment. The third visit will allow us to conduct the sampling. We are also planning a follow-up subslab sampling event in about six months to confirm the first set of sampling results and to see if concentrations in soil vapor beneath your home or business vary on a seasonal basis. This visit will use the same sampling locations and equipment.

To help you better understand the testing process and why we are conducting this investigation, please read the following enclosures:

- Fact sheet describing the site history
- Fact sheet describing subslab sampling activities

- An access agreement to provide us with permission to sample the soil vapor beneath [residence or building]
- Postage-paid return envelope for the access agreement

[Entity] will mail you the test results for your home or building when they become available (about [#] weeks after retrieval of the sampling equipment). Sampling results for a particular [home or building] will also be provided to DTSC. We will design any report or information shared with the public to protect your privacy.

If you have questions or concerns about the subslab sampling program, please contact [name, company/agency, title] at [phone number]. We look forward to communicating with you soon.

Sincerely,

[Name]
[Title]

Enclosures

Sample Fact Sheet, March 2012

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

SUBSLAB SAMPLING ACTIVITIES

Overview

[Entity] wants to address the potential vapor intrusion in the [community or neighborhood name]. As part of this commitment, [entity] offers to conduct subslab sampling beneath select residences and businesses within the potential vapor migration area. We use the subslab soil gas data to see whether contaminants have accumulated directly under the building at concentrations that could degrade indoor air quality.

There is no cost to you. To accept the offer, please sign the enclosed access agreement and return it using the enclosed postage-paid envelope. [Entity] representatives will contact you once we receive your signed access agreement.

Steps Involved in Subslab Sampling:

1. Visit 1. Our sampling team will work with you to identify sampling locations that will produce an accurate measurement of any contaminant concentrations beneath your [home or building] while minimizing the impact to the slab and any subslab utilities. We also want to consider aesthetics when selecting sampling locations. Typically, at least two subslab probes are installed in homes. More probes may be needed for other types of buildings, depending on the square footage and layout. During this visit we will also work with you to conduct an inventory to identify any household or business products that may interfere with the sampling effort.

2. Visit 2. Our sampling team will install a probe through the slab at the selected sampling locations. To accomplish this, carpets and floor covering may need to be pulled back or removed temporarily before a small hole (about 1.0 to 1.25 inches in diameter) can be drilled through the slab. A metal probe is then inserted into the hole and sealed. The top of the probe is flush with the top of the slab.

3. Visit 3. About two hours after probe installation, one of our staff will place a steel canister on the floor next to each sampling location and connected to the probe with tubing. The vacuum-sealed canister will draw the subslab vapor through the tubing. Sample collection typically takes about [#] minutes. Once the sample is collected, the canister will be sealed and shipped to a laboratory for analysis. The tubing material will be removed. Workers will then place the flooring material back over the probe.

4. We will share the sampling results with you approximately [#] weeks after sample collection. These results will also be shared with the California Department of Toxic Substances Control (DTSC) and will be included in a report of results for the investigation activities.

5. Visit 4. Steps 3 through 5 will be repeated approximately six months later. The probe will be removed and the slab patched after the subslab investigation is complete for the residence or building. Flooring material will be restored after probe removal.

DTSC Contacts

[Names, titles, contact information for DTSC staff]

Summa canisters are used to collect a subslab sample (lower left) and a companion indoor air sample (center) in an office building.

APPENDIX C. INDOOR AIR SAMPLING

Sample Notification to Tenants

Sample Letter to Occupants / Owners

Sample Fact Sheet: VOCs in Household Products

Sample Instructions to Occupants

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
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Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

Notification to Tenants of
[Address]
[City], California
[Date]

Why We Are Here

The [entity], with direction from the Department of Toxic Substances Control (DTSC), is investigating the sources of dry cleaning solvent contamination in soil vapor and groundwater at [address]. The solvent contamination comes from past dry cleaning operations conducted at [address]. The dry cleaners are no longer there, but the contamination remains in soil, groundwater and air.

The main contaminant of concern is perchloroethylene (also known as "perc", "PCE", and "tetrachloroethylene"). Depending on the amount and duration of exposure, PCE can have adverse human health effects such as kidney and liver damage and has caused cancer in laboratory animals.

What We Found

On [date], indoor air samples were taken to determine if PCE contamination found in the soil gas under the building from earlier tests has migrated into the building's air, and if so what concentration. Indoor air sampling results show no immediate health threat. However, the concentrations reported do pose a problem in that they exceed what is considered safe for people living or working in the building over an extended period of time.

What actions are being taken to solve the problem?

DTSC has notified the building owner ([owner name]) and occupants about the problem so that they are aware of the potential health risks.

There are means of reducing the concentrations of the chemicals in the indoor air and preventing the chemicals from migrating into the building. Increasing the air flow in the building can reduce the concentration of contaminants indoors, and pressurizing the building can help prevent toxic vapors from migrating inside. The building owner has contacted a heating ventilating and air conditioning contractor to see what can be done

to increase the air flow indoors. A low pressure barrier can also be created beneath the building to prevent vapor migration from below.

The [entity] is continuing its investigation of the solvent contamination at the site to obtain the environmental information needed for developing short and long term solutions to the problems. We will work closely with the [entity], building owner and tenants to make sure that your health is protected.

Project Contacts

If you have questions, please contact one of the following individuals:

[name]
DTSC Project Manager
[phone number]
[email address]

[name]
DTSC Public Participation Specialist
[phone number]
[email address]

[name]
DTSC Toxicologist
[phone number]
[email address]

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

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Edmund G. Brown Jr.
Governor

SAMPLE LETTER TO OCCUPANTS / OWNERS

[Date]

[Name]
[Address]
[City, State, Zip Code]

Dear [Resident]:

As you may be aware, the Department of Toxic Substances Control (DTSC) is coordinating a voluntary indoor air study in your community. This package contains information on our indoor air study including documents that must be completed to participate. Please take the time to review the package. Shortly, [name of the DTSC staff] will contact you to provide additional information and to answer any questions you may have.

DTSC is the lead agency providing oversight of the investigation and cleanup of the [name] facility located at [address], [city], California. Historically, [facility name] managed hazardous waste, including volatile organic compounds (VOCs). The VOCs released from the facility have migrated off-site towards neighboring properties and may impact indoor air quality through a process called vapor intrusion.

With your consent, DTSC will arrange for the collection of indoor air samples to see if VOCs may be entering your home. Please be assured that if VOCs are found to be entering your home, we can use relatively simple mitigation measures to lessen the problem. We will complete all the proposed activities, including sampling and mitigation measures (if required), at no cost to you.

In order to provide you with additional information and resources, please find the following enclosures:

- Vapor Intrusion Fact Sheet - provides additional information on vapor intrusion.
- VOCs in Household Products Fact Sheet – provides information about volatile chemicals in common household products.
- Sample Collection Instructions - please read prior to sample collection.

- Access Agreement Form – by signing this, you are signifying your desire to participate in the indoor air study and willingness to allow DTSC staff to come onto your property.
- Return Envelope - for the access agreement

If you have any questions regarding this letter, please contact:

[name]
Project Manager
[phone number]
[e-mail address]

or

[name]
Public Participation Specialist
[phone number]
[e-mail address]

Lastly, DTSC will host a public meeting to provide information to [name of community or neighborhood] and to answer questions. The meeting will be held at [time] on [date], at [location]. We welcome your participation in this meeting.

Sincerely,

[Name]
[Title]

Enclosures

Sample Fact Sheet, March 2012

VOLATILE ORGANIC COMPOUNDS (VOCS) IN COMMONLY-USED PRODUCTS

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

Many of the products that we use in our businesses and households contain certain kinds of chemicals that enter the air as gases very easily. Known as volatile organic compounds or VOCs, they are ingredients in commonly used products. Because of their widespread use, VOCs can be found in the air in just about any indoor setting.

Examples of Products	Possible VOC Ingredients
Personal care products such as nail polish, nail polish remover, perfumes, hair spray	Acetone, ethyl alcohol, isopropyl alcohol, methacrylates, ethyl acetate
Dry cleaned clothes, spot removers, fabric cleaners, leather cleaners	Tetrachloroethene (perchloroethene (PERC)) Trichloroethene (TCE)
Aerosol spray products	Heptane, butane, pentane
Deodorizers, air fresheners	Naphthalene, 1,4-dichlorobenzene
Upholstered furniture, carpets, plywood, pressed wood products	Formaldehyde
Refrigerant from air conditioners, freezers, refrigerators, dehumidifiers	Freons (trichlorofluoromethane, dichlorofluoromethane)
Moth balls, moth flakes	Naphthalene, 1,4-dichlorobenzene
Fuels and products containing fuel and petroleum distillates. Examples include kerosene, gasoline, furniture polish, oil-based paints, paint thinner, insect pest products	Benzene, toluene, ethylbenzene, xylene, hexane, cyclohexane, 1,2,4-trimethylbenzene
Paint stripper and adhesive removers	Methylene chloride, toluene, carbon tetrachloride
PVC cement and primer, adhesives, contact cement, model cement	Tetrahydrofuran, cyclohexane, methyl ethyl ketone, toluene, acetone, hexane, 1,1,1-trichloroethane, methyl-iso-butyl ketone
Degreasers, brake cleaner, carburetor cleaner, gun cleaner, electronics cleaners, spray lubricants, commercial solvents	Methylene chloride, PERC, TCE, toluene, xylenes, methyl ethyl ketone, 1,1,1-trichloroethane

How can I reduce the levels of VOCs indoors?

- Find out which products used or stored in your home contain VOCs.
- Store products containing VOCs in tightly sealed, original containers in secure, well-ventilated areas.
- Store the products in an area where people do not spend much time, such as the garage or an outdoor shed.
- Buy these products in amounts that are used quickly.
- Safely dispose of unneeded products containing VOCs, such as through a special household hazardous waste collection program in your area.
- Use products containing VOCs in well-ventilated areas or outdoors.
- Increase ventilation by opening windows and doors or using an exhaust fan.
- Carefully read labels and follow direction for use.

Where can I find out more?

- DTSC's website for information about the household hazardous waste program http://www.dtsc.ca.gov/HazardousWaste/UniversalWaste/HHW.cfm
- The Inside Story: A Guide to Indoor Air Quality http://www.epa.gov/iaq/pubs/insidest.html
- National Institute of Health's website for information about chemicals found in many household products. http://hpd.nlm.nih.gov/products.htm

Sample Fact Sheet, March 2012

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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SAMPLE COLLECTION INSTRUCTIONS - INDOOR AIR SAMPLING EVENTS

Shortly, representatives from the Department of Toxic Substances Control (DTSC) will be collecting indoor air samples from your home. In order to make sure that we have the best possible data quality, we ask you to follow these instructions.

Before Sampling

We ask you to remove sources of Volatile Organic Compounds (VOCs) from within the home before the indoor air sampling. Sources of VOCs can be identified based on experience and also by use of special instruments. The following household items may contribute VOCs and should be checked, and if necessary removed, prior to indoor air sampling:

- Cleaning products
- Glues and solvents
- Lighter fluid
- Pesticides
- Paints and varnishes
- Fuel or gasoline
- Items with a pressurized spray bottle
- Freshly dry-cleaned clothes
- Products with fragrance or an odor

In general, any of these named products should be removed prior to sampling. Also, with your approval, we can use a special instrument to check for other products that are contributing VOCs. It should be noted that many common items found in the home contribute VOCs to the air and most of them are not harmful in any way.

Items removed from the home should be safely stored until indoor air sampling is completed. Often, you can temporarily store items in a detached garage or garden shed during indoor air sampling. An alternative, less preferred option, is to store removed items in a large container with tight-fitting lid.

Special instrument to check for VOCs in household cleaning products.

During Sampling

On the day of the sampling, we will arrive to drop off the indoor air sampling canister at a pre-arranged time. The indoor air sampling canister will be calibrated to take a continuous air sample over the course of several hours ((commonly 24 hours). The canister does not require any power or batteries. DTSC staff will recommend a suitable location for the canister. Once the canister has been located and sampling begins, it is important not to touch or to interfere with it. DTSC recommends that you try to forget that it is in your home. If you have children or other family in the home, you should explain what the device is and convey these instructions to them.

The goal of the indoor air sampling is to measure the concentration of VOCs in your home under normal conditions. Therefore, during sampling, you should continue with your regular routine. However, it is important to understand that certain activities will have an impact on the concentration of VOCs in the air. For example, opening windows and external doors for an extended period will generally decrease the concentration of VOCs in indoor air. These activities should be avoided. Also, we would discourage you from smoking or burning of candles in the house during sampling.

Indoor air sampling canister in use.

APPENDIX D. COMMUNICATING SAMPLING RESULTS

Guidelines for Results Transmittal Letters

Example Fact Sheet for a School

Sample Fact Sheet to General Community

Example Public Meeting Presentation

Chemical-Specific Fact Sheets
(see Section 4.2 and Appendix A for sample tetrachloroethylene fact sheet)

GUIDELINES FOR RESULTS TRANSMITTAL LETTERS

Introduction

The following guidelines have been prepared to assist with the transmittal of results of vapor intrusion sampling to home owners and occupants. These guidelines were prepared following a review of actual results transmittal letters. While every letter was different, the review found that results transmittal letters have several common elements which have been incorporated into the guidelines.

The project team (Project Manager, Public Participation Specialist, and Toxicologist) likely will want to have one-one meetings with the business owner, home owner or occupant in order to provide the results personally and to respond immediately to questions that arise from the results. Personal meetings can build trust and creditability with the people directly affected by our investigation. Please see the discussion in the "Guidelines for Access Agreements" (Appendix A) for more tips regarding personal meetings.

Depending on the project, the project team may also elect to hold a public meeting following completion of a vapor intrusion study in order to provide information to the community in a common forum and to field and answer questions. If a meeting has been scheduled, details of the meeting should be included in the letter.

Transmittal Letter Outline

- The letter should be sent by the regulatory agency on official letterhead.

- The letter should be translated, as appropriate, based on the community demographics and past practice.

- The letter should be addressed to the party that signed the access agreement. If the property is leased, separate letters should be sent to the property owner and the occupant.

- The first paragraph should include an introductory paragraph that addresses the following:

    - purpose of the letter
    - property address
    - date(s) of sample collection

    Example language:
    "The Department of Toxic Substances Control (DTSC) is writing to provide you with the results of the [recent indoor air survey and/or soil gas sampling] of your property

located at [address]. The [indoor air and/or soil gas] samples were collected on or about [date] by [contractor/consult] with oversight by DTSC."

- The second paragraph should summarize the results of the sampling. It is important to be honest and straightforward with the property owner.
  - Indicate whether the chemicals of concern for the study area were found in indoor air or outdoor air samples.
  - Indicate whether the levels of the chemicals may represent a potential short term health risk (usually a cumulative cancer risk of one-in-ten-thousand can be interpreted as threshold below which short term health risk are not anticipated).
  - If chemicals of concern for the study area were found, but the estimated cumulative cancer risk is less than one-in-one-million and a hazard index of 1, it is appropriate to indicate that the levels of chemicals are below levels of concern for human health.

Example language 1 (no detections):
"The indoor air sample results from your property did not contain detectable levels of the chemicals of concern for the study area. This is welcome news and indicates that vapor intrusion is not occurring at your home. The attached table identifies the specific indoor air survey results for your home."

Example language 2 (detections but no risk/hazard):
"The indoor air sample results from your property contained detectable levels of the chemicals of concern for the study area; however, the levels of chemicals in your home do not present any [significant risk or hazard, as appropriate]. Shortly, [contractor/consultant and/or DTSC] will contact you to discuss collecting additional samples to confirm the prior results. The attached table identifies the specific indoor air survey results for your home."

Example language 3 (detections with possible risk/hazard – 1st sampling event):
"The indoor air sample results from your property contained detectable levels of the chemicals of concern for the study area; however, the levels of chemicals in your home do not present a short-term health risk. In general, DTSC evaluates these types of chemicals to determine if prolonged exposure may cause adverse health effects. Prior to drawing any conclusions, additional study of your home is recommended to understand whether vapor intrusion is occurring. Shortly, [contractor/consultant and/or DTSC] will contact you to discuss collecting additional samples to confirm the prior results. The attached table identifies the specific indoor air survey results for your home."

Example language 4 (detections with possible risk/hazard – 2nd sampling event):
"The indoor air sample results from your property contained detectable levels of the chemicals of concern for the study area. However, the levels of chemicals in your home do not present a short-term health risk. In general, DTSC evaluates these types of chemicals to determine if prolonged exposure may cause adverse health

effects. The attached table identifies the specific indoor air survey results for your home.

Based on the results of two rounds of indoor air sampling, DTSC does not recommend collection of additional data at this time. DTSC will work with the responsible party on source area remediation (cleanup) efforts which are anticipated to reduce chemical concentrations. DTSC will contact you at a future date to discuss follow-up sampling to confirm that source area cleanup efforts have been successful in reducing vapor intrusion at your property."

Example language 5 (detections with possible significant risk/hazard):
"The indoor air sample results from your property contained detectable levels of the chemicals of concern for the study area. The levels of chemicals in your home may present a short-term health risk. Shortly, DTSC will contact you to discuss the results and options available to protect your home from vapor intrusion. The attached table identifies the specific indoor air survey results for your home."

Note: If the results of sampling indicate that vapor intrusion may present a short term health risk then it is strongly recommended that the home owner is contacted in person and the letter is hand delivered to avoid any possible alarm.

- The third paragraph should discuss in greater detail how risk management decisions are made. This paragraph may direct the reader to the "Vapor Intrusion" fact sheet also found in the Appendix A. (Note: this paragraph is only appropriate or necessary if volatile chemicals were detected at the property).

  Example language:
  "In order to help you interpret the results in the attached table, DTSC has included a Vapor Intrusion Fact Sheet. The fact sheet provides more detailed information on the [risk or hazard, as appropriate] posed by the chemicals found in your home."

- The fourth paragraph should discuss the results of the vapor intrusion study as a whole. The language should direct the reader to a repository where they may review the study report.

  - Briefly discuss the findings of the study
  - Reference any reports generated by the responsible party
  - Information repositories are commonly established in local libraries

  Example language:
  "The results from your property, and other properties in the study area, are discussed in a report titled "[report title]" and dated [date] (Report). The public copy of the Report discusses the results generally and does not disclose the results from individual properties. The Report is available to the public on DTSC's website at the following link ([EnviroStor link]) and also in hard copy for review at the following locations: [List repositories]."

- The sixth and final paragraph should discuss any ongoing source area cleanup activities. The purpose of this paragraph is to reassure the home owner or occupant that steps are being taken to address and monitor the source area. The paragraph should discus:
  - o any interim measures
  - o ongoing monitoring

- The letter should include a polite close that thanks the home owner for their participation.

  Example language:
  "Thank you for agreeing to participate in the vapor intrusion indoor air study. If you have any questions regarding this letter or any other aspect of the study please do not hesitate to contact the following DTSC staff:

  [Project manager name and contact information]
  [Public participation specialist name and contact information]."

- The results of the sampling should be included in a table as an attachment to the letter. The table should include the following:
  - o list of chemicals of concern for the study area and any other chemicals with detections above reporting limits (so the home owner / occupant can identify chemicals that may have a source within the home)
  - o indoor air sample results
  - o outdoor air sampling results (e.g., background samples)
  - o risk estimate based on indoor air sample results (only for chemicals of concern for the study area)

Example table:

Chemical Name	Chemical of concern for study area? [Yes/No]	Indoor Air Sample 1 (Kitchen) [$\mu g/m^3$]	Indoor Air Sample 2 (Living Room) [$\mu g/m^3$]	Outdoor Air Sample (Street) [$\mu g/m^3$]	Risk Estimate [Elevated cancer risk]	Hazard Estimate [Hazard Quotient]
PCE	Y	0.30	0.35	0.37	7.2×10^{-6}	-
TCE	Y	1.00	ND	0.70	8.0×10^{-6}	-
Benzene	N	0.06	0.05	ND	-	-
Cumulative risk estimate (COCs only)					2×10^{-5}	
Hazard Index (COCs only)						-

Notes:
PCE = Tetrachloroethylene
TCE = Trichloroethylene
COC = Chemical of concern for the study area
$\mu g/m^3$ = micrograms per cubic meter
ND = not detected (level below laboratory detection limit)

Laws, Regulations &

Pollution Prev

Managing Hazardous Waste

Preventing environmental damage from hazardous wastes, and restoring contaminated sites for all Californians

Public Involvemen

Cleanup

Science & Tech

State of California

Department of Toxic Substances Control

Public Involvement

EXAMPLE

FACT SHEET, November 2005

Wyle Labs Investigation Update

This fact sheet gives an update on the investigation of the former Wyle Laboratories site in Norco, California, including the results of recent sampling at Norco High School. The goal of the investigation is to find and clean up chemical contamination that resulted from Wyle's former operations. This includes sampling areas around the site to find any chemical contamination that has moved offsite into the community.

Our agency is the Department of Toxic Substances Control (DTSC). Our mission is to protect human health and the environment by overseeing the investigation and cleanup of this site.

School sampling results from July and September 2005

In July 2005, we required Wyle to test the indoor air at Norco Elementary, Norco Intermediate, and Norco High School. Trace levels of two common solvents, TCE (trichloroethene) and PCE (tetrachloroethene), were found in some classrooms at all three schools. These levels were similar to what is found in outside air, both in Norco and in surrounding communities. *We determined that all three schools are safe.* At the high school, one classroom in the Science Building had a trace level of vinyl chloride. While this level did not pose a health risk, we required Wyle to further investigate the High School classrooms.

In September 2005, Wyle tested the air in 12 more classrooms at the high school. The results showed very low levels of TCE in three rooms, and of PCE in nine rooms. In most classrooms the levels found in indoor air are in the same range as those found in July. These levels are similar to levels seen in the outdoor air in Norco and surrounding communities. In addition to TCE and PCE, low levels of vinyl chloride were found in two classrooms in the Science Building. These levels are similar to the vinyl chloride level seen in the July 2005 sample in the Science Building. The vinyl chloride in these two rooms does not pose a risk to students. However, these levels may pose a very slight increase in risk to a teacher who is in the room for 40 years or more. The Science Building was constructed in 2003. *All classrooms at the high school are safe for students.*

The detailed results of both the July and September sampling are on our website and at the locations listed at the end of this fact sheet.

School groundwater and soil gas results

Both rounds of sampling at the high school included tests of the groundwater and the soil gas. The chemicals TCE and PCE were found in the soil gas and groundwater at low levels that do not pose a health risk. The water used at the schools is supplied by the City of Norco from distant wells and other sources. The drinking water at all three schools was tested in September 2005 and no contamination was found.

Next steps at the high school

Because of the repeated detections of vinyl chloride in the Science Building classrooms and the slight long-term risk to faculty, we are requiring Wyle to take measures to reduce the trace amounts of chemicals in these rooms. We will have more information on this in the near future. We are also requiring Wyle to continue monitoring indoor air, soil gas, and groundwater at the high school on a regular basis.

Other offsite sampling

The testing at the schools is only a part of a larger ongoing investigation. With our oversight, Wyle is sampling groundwater, soil gas, and indoor air on the Wyle property and in the surrounding areas. Some of this sampling will help us determine whether the contamination extends beyond the school property, and if sampling is needed in nearby areas.

Most recently, Wyle collected indoor air samples at four residences: 965, 970, 975 and 998 Third Street. These four homes were close to where we found soil gas contamination during sampling last January. This sampling was part of our effort to find the extent of contamination beyond Wyle's northwest boundary. The indoor air sampling found trace levels of TCE and PCE, similar to what is in the outdoor air. These levels do not pose a health threat to the residents in these homes.

Vapor removal on Golden West Lane

As we've reported in earlier fact sheets, Wyle will be removing chemical vapors from the soil in the area next to Wyle's northwestern boundary. This system will use a vacuum unit to pull chemical vapors from the soil near the southern end of Golden West Lane. The chemicals will go through carbon filters, and clean air will be discharged. Soil vapor extraction wells have been installed at the end of the street and in three driveways. The extraction system will be installed on the Wyle property within the next few weeks.

More investigation and cleanup

The investigation at Norco High School and the cleanup of soil vapors from Golden West Lane are only a small part of the overall Wyle investigation and cleanup. The ultimate goal is to find out the full extent of the chemical contamination from the Wyle site and clean it up. We will continue to keep you informed as this investigation proceeds, and the final cleanup proposal will be offered for public review before we make a final decision.

FOR MORE INFORMATION

If you have questions or would like more information about the Wyle site investigation, please contact:

DTSC Public Participation Specialist
Kim Foreman, (714) 484-5324
Email: KForeman@dtsc.ca.gov

DTSC Project Manager
Juan Osornio, (714) 484-5498
Email: JOsornio@dtsc.ca.gov

Media Inquiries

Ms. Jeanne Garcia, (818) 551-2176
Email: JGarcia1@dtsc.ca.gov

For more information about our department, please visit our website at **www.dtsc.ca.gov**

Notice to Hearing Impaired Individuals: TDD users can use the California Relay Service at 1-888-877-5378 to reach Public Participation Specialist Kim Foreman at (714) 484-5324.

INFORMATION REPOSITORIES

The sampling results as well as other Wyle-related documents are at Norco City Hall, 2870 Clark Avenue, Norco; and the Corona Public Library, 650 S. Main Street, Corona.

Reports and sampling results can also be found on our website at: http://www.dtsc.ca.gov/SiteCleanup/Wyle_Laboratories/index.html

Fact Sheet
[Date]

DTSC is one of six Boards and Departments within the California Environmental Protection Agency. The Department's mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

SAMPLE

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Results of soil gas and indoor air sampling done near the XYZ facility

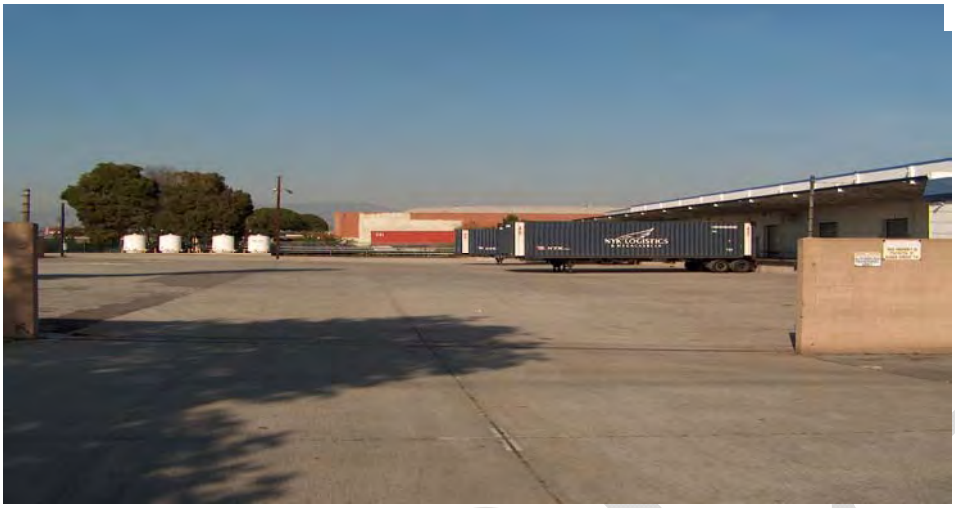

Photo of the facility as it looks today.

This is the fourth in a series of fact sheets about the XYZ Street facility. As you may be aware, last [month] we took indoor and outdoor air samples at [#] homes. The purpose of this sampling was to find out if chemical vapors from the site are moving offsite into people's homes and yards. The main chemicals of concern are solvents such as tetrachloroethene (PCE), trichloroethene (TCE), and dichloroethene (DCE). This fact sheet gives the results of those tests, as well as a description of the history and future plans for the investigation.

Our agency is the Department of Toxic Substances Control (DTSC). Our mission is to protect human health and the environment by overseeing the investigation and cleanup of the site.

Our indoor air tests found some chemical vapors, at fairly low levels that don't present an immediate health risk. These chemical vapors are similar to what are in the outdoor air in many areas of Los Angeles. Until we do more tests, we won't know if the vapors came from the XYZ site or from other sources.

Public Meeting

[Date] at [Time]

City of ABC
Council Chambers
5655 Any Street
ABC City, CA 90000

At this meeting, we will present project information, discuss sampling investigations, and our staff will answer questions or hear your concerns

Meeting Accessibility

For information on accessibility and to request reasonable accommodations, please contact [name] at [phone number] at least one week before the meeting.

The XYZ site is about [#] acres in size, in a mixed industrial, commercial, and residential area of ABC City. From the mid-1950s until [year] the facility was used for the storage and distribution of a wide variety of chemicals. It formerly contained [#] underground storage tanks that were

removed in [year]. After the tanks were removed, further investigations found more contamination in the former underground storage tank area.

XYZ entered into a legal agreement with us in [month, year] to investigate and clean up the site and any contamination that may have moved offsite into the community. This investigation has been conducted by [entity], with our agency's oversight since [year].

Indoor sampling was done at residences in [month, year]

We did our indoor air sampling in [month, year] at [#] residences located near the western boundary of the facility. We interviewed residents before we started the indoor sampling. Afterwards we used an organic vapor survey instrument. We discussed with local residents how the sampling instruments work. These residences were chosen because of the high levels of PCE found in shallow soil gas samples close to the homes. The objective of this sampling was to see if chemicals were found in indoor air at these homes.

The sample results found volatile organic compounds (VOCs) are in the homes. However, the levels are too low to cause short-term health effects. Some of these VOCs were also found in the outdoor air. The table below shows the range of sampling results.

Compound	Indoor Results ug/m^3 *		Outdoor Results ug/m^3	
	Lowest	Highest	Lowest	Highest
PCE	1.02	12.00	0.88	1.40
TCE	0.32	7.50	0.25	3.20
Chloroform	0.30	1.70	0.18	0.32
Cis-1,2-DCE	ND*	0.37	ND*	ND*
1,1-DCE	ND*	1.90	ND*	ND*
* ND = non detect				

*ug/m3= micrograms per cubic meter

The study found the potential for long-term increases in cancer risk. The estimated potential cancer risk due to the increased levels of VOCs is within the USEPA acceptable risk range. These risks are about the same as those from other VOCs found in outdoor air in the Los Angeles area. In cases of potential residential exposure, we are very conservative in managing these risks. There are many potential sources of VOCs including the underground vapor plume associated with the nearby XYZ facility. These chemicals could come from household cleaners, hobby paints and glues, clothes from some dry cleaners, outdoor air, and other possible sources. Our goal is to protect local residents from undue indoor exposure to vapors originating from releases coming from the facility that are now found in the subsurface soil.

We also want to find out if chemical vapors from the facility could be posing a risk to these homes and, if so, to clean them up. To do this we have to conduct more tests and get more information. These tests may include taking more indoor air samples, taking air samples from the crawl spaces below the buildings, and sampling the soil gas within the front or back yards. We will inform the local residents when we will start the next round of sampling.

Earlier tests found chemicals in the groundwater and soil at the facility

Other sampling done at the facility between [timeframe] found a plume of chemical contamination in the groundwater deep below the site. There is no indication that drinking water wells are affected. We also found chemical vapors in the soils in the western part of the property.

The highest levels of VOCs in soil gas are in the northwest corner of the site. To see if this contamination had spread beyond the site boundaries, we did off-site testing in [year]. Sampling results showed that soil gas vapors have moved off-site under the nearby residential area west of the facility. As a result, XYZ is required to clean up the vapors from the residential areas and to prevent

further movement of the chemicals into the [name of the neighborhood].

Cleanup will begin using soil vapor extraction. This cleanup will be done with a soil vapor extraction treatment (SVET) system. This system pulls vapors from the soil using a vacuum, puts them through an activated carbon filter, and discharges the cleaned air. DTSC has overseen the beginning construction and we plan to finish by the end of [month, year]. XYZ has obtained a South Coast Air Quality Management District (SCAQMD) permit for this treatment unit. The SVET system is considered a temporary cleanup solution until we can determine the final remedy.

XYZ is required to conduct start-up testing to see how well the SVET system cleans the vapors, and what kind of operation and maintenance it requires. Our agency will need this information before we can give final approval for the use of this system and we also require this analysis for California Environmental Quality Act (CEQA) purposes. DTSC plans on finishing the start-up testing by [month, year].

What happens next

The overall investigation, which will include more on-site and off-site testing, will continue until we have enough information to design a plan to clean up all contamination from the XYZ site, however far it extends. Once the site investigation is finished, we will conduct a study to determine the final cleanup remedy. This study will include a comparison of different cleanup options and a CEQA analysis of the option we propose. Before we make a final decision, we will put our proposal out for your review and comment. We plan to finish the site investigations in [year] and we plan to propose a final remedy in [month, year].

Whom to contact at DTSC

[name]
Public Participation Specialist
[phone number]; [e-mail address]

[name]
Project Manager
[phone number]; [e-mail address]

For media inquiries

[name]
DTSC Public Information Officer
[phone number]; [e-mail address]

More information available in the libraries and at our office

You can get more details about the indoor air results from the USEPA's summary portion of the report dated [date] and our documents about the XYZ, Any Street site, are at the following locations:

City of ABC Public library
(Central library)
5644 Any Street
ABC, CA 90000
[phone number]

City of ABC Public library (North branch)
2269 Any Street
ABC, CA 90000
[phone number]

Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311
Please contact [name] at [phone number] for an appointment.

Notice to the Hearing Impaired: For more information, you may use the California State Relay Service at 1(888) 877-5378 (TDD). Ask them to contact [name] at [phone number].

*For more information about DTSC, visit our website at **www.dtsc.ca.gov**.*

Health Risk Assessment

Dr. Bill Bosan

Toxicologist

Human and Ecological Risk Division

EXAMPLE PRESENTATION

Indoor Air Quality (IAQ) Results

- Norco Elementary and Intermediate Schools
  - No Wyle-related chemicals in groundwater (no source)
  - TCE and PCE the same inside and outside
  - No vinyl chloride ever detected inside
  - The Elementary and Intermediate Schools are SAFE

IAQ Results, Cont.

- Norco High School, Excluding the Science Building
  - Second, seasonal sampling event conducted in January 2006
    - Low levels of TCE, PCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride found in soil gas
    - Elevated levels of TCE and PCE found in groundwater at the northern end of the HS
    - Low levels of TCE and PCE found indoors
      - Same levels of TCE and PCE found outdoors
    - No vinyl chloride detected indoors

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IAQ Results, Cont.

- Norco HS Science Building
  - Low levels of TCE, PCE and vinyl chloride found indoors
    - Levels of PCE and TCE the same inside and outside
    - Low levels of vinyl chloride found:
      - 3 of the 6 classrooms on the first floor
      - all of the labs on the first floor
      - the four rooms sampled on the second floor
      - the stairwells, restrooms and the utility rooms
      - outdoors on the roof and next to the baseball field

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IAQ Results, Cont.

- Norco HS Science Building
  - Vinyl chloride poses no immediate threat to anyone's health
  - Vinyl chloride poses no increased risk of cancer for students
  - Vinyl chloride may pose a very slight increased risk of cancer for long-term faculty
    - Assumed to work all day for 40 years in the Science Building

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Wyle-Specific Chemicals of Potential Concern

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- Vinyl chloride

6

Wyle-Specific Chemicals of Potential Concern

- Potential Long-Term Health Effects
  - No association between exposure to PCE, TCE or vinyl chloride and development of leukemia
  - TCE and PCE
    - Long-term exposure to animals:
      - Liver and kidney toxicity
      - Liver tumors in mice and kidney tumors in rats
  - Vinyl chloride
    - Long-term human exposure (workers):
      - Liver toxicity
      - Liver cancer – known human carcinogen

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APPENDIX E. OTHER RESOURCES

Sample Fact Sheet: Vapor Intrusion Mitigation System

Sample Proposition 65 Notification Letter

Sample Request for Federal Response Action

Sample Preparation Effort for a Media Interview

Sample Fact Sheet, March 2012

Vapor Intrusion Mitigation Systems

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

Cal/EPA

Vapor Intrusion (VI) mitigation systems include a number of methods that are used to reduce the potential for migration of contaminated vapors into an overlying building. What the methods have in common is that they are all considered "engineering controls," that is, there is some engineering aspect to all of them. Vapor intrusion mitigation systems are established engineering practices. They were first developed to control radon in houses, and the American Society for Testing and Materials (ASTM) have published standards for consistent and safe construction of these systems.

Mitigation for New Buildings

The most common kind of VI mitigation system is a subslab depressurization system (SSDS). The SSDS is used most commonly for new housing, to control vapor migration into buildings that are constructed over a known contaminant plume. The SSDS reduces to a safe level the concentration of vapors that may migrate into a home.

Vapors migrate into a home through openings such as cracks and joints in the foundation. Therefore, before the SSDS is installed, all open areas are sealed. The seal consists of a tarry-like substance that, when dry, will prevent the movement of air through the material. In some cases of low-level contamination, this action is enough to bring the air within in building to a safe level.

Once all openings are sealed, it is time to install the SSDS. The SSDS consists of a layer of gravel that is placed, as the "subslab" name implies, under the slab of a slab-on-grade building. A series of slotted polyvinyl chloride (PVC) pipes, 2 to 4 inches in diameter, are placed within the gravel. The gravel has a high amount of air space associated with it, in comparison with the surrounding material, so sub-surface air will prefer to flow though the gravel rather than up through the house. The horizontal pipes that direct the air away from the house are connected to a vertical pipe. The air continues up through the vertical pipe and out to the atmosphere.

The flow of the air through the pipe results in the pressure under the surface being slightly less than the pressure in the house. This is the "depressurization" portion of the SSDS. As long as the pressure under the house is less than the pressure in the house, air within the house will flow down and out. A system that relies on the pressure difference between the gravel and the overlying building is referred to as a passive system. An active system has a fan installed that increases the difference in pressure between the subsurface and indoor air. The fan (also referred to as a blower) is usually small and quiet, similar to a fan that may be installed in a kitchen or bathroom of a single family residence.

As a precautionary measure, we recommend that a subslab liner, commonly referred to as a "vapor barrier" also be installed in the building. Vapor barriers were originally designed to keep moisture out of buildings, and are also referred to as moisture barriers. Many believe that the gravel/pipe depressurization system described above is sufficient to keep subsurface air from migrating into overlying buildings. However, DTSC recommends the liner be installed as a precautionary measure, as a sort of back up to the entire system. It is not, however, a primary component of the SSDS.

Many people are concerned that the air that is being vented to the atmosphere may be harmful. The concentrations of contaminants are typically so low that they are not harmful in the outside air. There is concern for harm only when the contaminated air comes into a building that may have the same people living in it over a number of years. In the rare cases that the air coming from the subsurface is contaminated enough that there may be a concern, then the air can be treated before being released to the atmosphere. In any case, the air should be analyzed and the local air district consulted, to be sure.

Mitigation for Existing Buildings

A different approach must be taken if the contamination is discovered after buildings have been constructed. The first step for existing buildings is the same as for new construction, specifically to evaluate the existing building for cracks or joints or any place that air can move from the subsurface and into the house. These joints and cracks are sealed with the airtight substance described above.

The second step is to create an area of lower pressure under the slab, but because it is an existing slab, a hole will need to be cut into the existing foundation that is large enough to fit a vertical pipe into it. This area is called a suction pit. One or more suction pits will be installed, and then the pipes are connected and a fan is used to create a vacuum and draw air away from beneath the slab. The air is then routed to the outside via a vertical pipe.

After Installation

If you are living in a house with a VI mitigation system, either a SSDS or a suction pit, there are certain precautions you should take, and certain expectations you should have. Your obligation is to not alter your house in any significant way without notifying the Department of your intention. You should also take care not to harm the system, or to turn off or remove the fan, if you have one.

You can expect that someone will maintain your system by conducting an annual inspection. They may measure the difference in pressure between the sub-surface and your house, or they may just ensure that there have been no structural changes. If someone asks to come into your house, they should contact you first and should provide identification. They will work around your schedule, and try to inconvenience you as little as possible.

In summary, a VI mitigation system consists of three parts: 1) sealing cracks and joints; 2a) installing a gravel and pipe system to depressurize the overlying building and vent sub-surface air to the outside, or 2b) installing a suction pit to direct air to the outside; and 3) installing a subslab liner, as a precautionary step.

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

Proposition 65 Notification
Pursuant to California Health & Safety Code § 25180.7
Designated Government Employee Disclosure Requirement

Date: [Date of notification]

To: [Addressee, e.g., local Board of Supervisors – note send to all County Supervisors or to all members of the city council]
[Addressee, e.g., local health officer in the county, city and district where the release/threatened release occurred.]

From: [Designated DTSC employee's name, title, program or branch]

Property Name: [List site name where applicable or otherwise identify property]

RP Name: [Name of responsible party for the address, if any]

Address: [Property address where release/threatened release occurred]

This notification by a designated government employee of the California Department of Toxic Substances Control ("DTSC") is made pursuant to the State's Safe Drinking Water and Toxic Enforcement Act of 1986 ("Proposition 65"). More specifically, this notification is being made pursuant to California Health and Safety Code section 25180.7, which is part of Proposition 65.

Within the last 72 hours, I have obtained information in the course of my official duties pertaining to the property address specified above, indicating that an [illegal discharge or threatened illegal discharge] of a hazardous waste [has occurred or may occur] and that such [discharge or threatened discharge] is likely to cause substantial injury to the public health or safety.

Preliminary information reveals that [insert facts supporting the allegation that an illegal or threatened illegal discharge has occurred or may occur].

[Addressee]
[Date]
[Page Number]

Sampling analysis shows the following: [insert one or more of the following text

Option 1: Facts supporting the allegation that the discharge or threatened discharge exceeds hazardous waste concentrations including identification of the contaminant(s), analysis results, regulatory hazard threshold level, or other facts showing that the contaminant(s) meet hazardous criteria.

Option 2: Concentrations of contaminant could not be quantified. However, if the contaminant becomes disturbed in the future, it may result in a discharge of contaminant at hazardous waste concentrations and characteristics.

Option 3: Information is preliminary and further tests are pending. Describe which tests are pending and when the results will likely be available.]

There is reason to believe that the [illegal discharge or threatened illegal discharge] is likely to cause substantial injury to the public health or safety because [insert facts supporting the allegation that a real and immediate physical injury or adverse physical condition may result to one or more persons].

If you have any questions, please call me at [phone number] between [hours of operation], [days of operation] or I can be reached by e-mail at [e-mail address].

I hereby certify that I am a designated employee and that I have reported the above information concerning a discharge or threatened discharge of hazardous waste to the appropriate officials pursuant to Section 25180.7 of the Health and Safety Code.

Signed_____

Title_____

Date_____

cc: [Copy to the local CUPA; and local City Council]

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

REQUEST FOR FEDERAL ACTION

The California Department of Toxic Substances Control (DTSC) requests assistance from the United States Environmental Protection Agency, Region 9 (USEPA) to conduct emergency response actions in [city], California that include: indoor air sampling for [compound(s), e.g., tetrachloroethylene (also known as PCE)] at residences in proximity to [facility type]; and mitigation of [compound] concentrations in indoor at [building type, e.g., residences] where warranted at the following locations:

1) Near the former [business name]; [address]
2) Near the former [business name]; [address]

Soil gas sampling data shows elevated [compound] detections in soil gas samples collected by the [entity] between [timeframe]. DTSC modeled the [compound] concentrations detected in soil gas samples at these facilities, using the DTSC Modified Johnson and Ettinger (J&E) Model. The results of the J&E modeling show indoor air concentrations at [building type] located in proximity to the [compound] detections in soil gas may exceed the [risk level, e.g., Acute Minimal Risk Level)]. The [risk level] is based on [describe basis. e.g., an evaluation of non-cancer effects, for an exposure duration of one to fourteen days]. The [risk level] was exceeded in [#] samples at [#] locations.

Based on the J&E modeling results, DTSC is requesting assistance from USEPA for the collection of indoor air samples to determine the potential exposure to [building occupants, e.g., residents living in the vicinity of the dry cleaners] identified above and mitigation of the [compound] concentrations in the indoor air at [building type, e.g., residences] as determined necessary by USEPA.

By making the request, the Requesting Agency recognizes that with respect to this emergency response action USEPA, or any other federal agency acting in conjunction with or on behalf of USEPA, may use its authority under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 42 U.S.C.A ' ' 9601, et seq., the National Contingency Plan (NCP), 40 C.F.R. Part 300 or any other federal statue, regulation or response program, to respond to and recover costs incurred in response to releases or threats of releases of pollutants and contaminants

as deemed necessary in USEPA's sole discretion to abate an imminent and substantial endangerment to public health or welfare or the environment at the location stated above. By making this request, the Requesting Agency acknowledges that notice pursuant to Section 128(b)(1)(D) of CERCLA, 42 U.S.C. ' 9628(b)(1)(D), is not applicable with respect to this emergency response action. The signatory of this request is authorized to make this request on behalf of the State.

Executed on this the [date] day of [month], [year].

[Name]
Chief, Enforcement and Emergency Response Branch

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

Sample Preparation for a Media Interview

Reporter's Question: Please provide a general update on this project, including soil, soil gas and groundwater. I assume findings reported in the letter have some correlation to the [month] fact sheet's statement regarding identifying "unacceptable risk to human health or the environment." What remains to be done? For example, the next sentence says that "potential cleanup alternatives will be developed." What are they, what is the timeline, and how will the public (including media) be notified?

Answer: On [date] the California Department of Toxic Substances Control (DTSC) requested assistance from the United States Environmental Protection Agency (USEPA) Emergency Response Section (ERS). DTSC's request was based on concern about possible indoor air exposures to tetrachloroethylene (also known as "PERC" or "PCE") due to data reported to DTSC, by the City through the [project name] (Project). The Project is for the investigation of PCE contamination detected in public water supply wells in [city].

On [date] USEPA ERS on-site coordinator decided ERS would move forward with indoor air sampling in [#] residences near Dry Cleaner 1 and in [#] residences near Dry Cleaner 2. The USEPA ERS met with residents on [date] and received permission to conduct the indoor air sampling. Further details on the USEPA work are best obtained from USEPA.

A voluntary cleanup agreement between DTSC and the [entity] is also in place. The agreement creates a new project that will investigate and clean up the source of the PCE that is now found in soil, groundwater and indoor air. The source (is or may be) the former Dry Cleaner 2 near [location description e.g., cross streets, address].

Project documents describing the milestones, time frames, and public participation activities for these projects are available on DTSC's Web page, EnviroStor database. In [date], DTSC initiated the Project to investigate and remediate sources of the PCE releases in [city]. [Envirostor links]

Reporter's Question: Are the homes occupied? Were residents notified about test results? When? Are they provided with recommendations? If so, what are the recommendations?

Answer: USEPA told us that at the time of the indoor air sampling, all homes near Dry Cleaner 1 were occupied. [#] homes near Dry Cleaner 2 were unoccupied. USEPA notified the residents about test results and recommendations. For more details, you should contact USEPA.

Reporter's Question: Were more homes tested than the [#] listed on the notice? If only [#] homes were tested and all showed health risks, why weren't more tested? Could others have contaminated air as well?

Answer: Please direct this question to USEPA. The media contact is [name] at [phone number].

Reporter's Question: In the [date] letter, [project manager] makes reference to "an emergency response" prompting samplings. What does that mean?

Answer: Again, you can obtain these details from USEPA and their media contact.

Reporter's Question: What is the significance of USEPA's short-term residential relocation levels?

Answer: Again, you can obtain these details from USEPA and [name] would be glad to help you.

Reporter's Question: I can see that there is some relationship between the CHHSL and potential cancer risk, but I'm afraid you'll still need to explain it to me, especially the significance of E-05 versus E-06.

Answer: For many decades this "one-in-a-million" statistical risk has widely been considered as acceptable in the U.S. and abroad. This is the probability of one additional cancer case in one million people exposed to a given concentration (often denoted as E-06 and referred to as the "point of departure" for risk management decisions). For residents, we assume that a person lives in the same house for 70 years, 350 days per year, 24 hour per day. The calculated conservative estimate of the indoor air concentration (for residents) of PCE that is associated with the "one-in a million" risk is [#] ug/m3. This concentration was determined from the Office of Environmental Health Hazard Assessment (OEHHA) as the Target Indoor Air Concentration. If exposure concentrations are higher, the statistical risk increases: A potential cancer risk of [#, e.g., 4×10^{-5}] means that that there is the probability for

[#, e.g., four] extra cases of cancer for every [#, e.g., 100,000] people exposed. At residences near Dry Cleaner 1, this was the highest potential risk from inhalation of all compounds (that were investigated by USEPA) combined. At residences near Dry Cleaner 2, the highest risk was [#, e.g., 4.9×10^{-5}] potential extra cancer cases in [#, e.g., 10,000] people (or [#, e.g., 49 in 100,000]). DTSC uses these Human Health Risk Assessments as a statistical tool to make decisions on what actions are necessary to protect the public health and the environment. These numbers do not represent actual cancer cases.

Reporter's Question: Please explain in laymen's terms the numbers cited in health risk calculations. For example, we'll need to know what a "1E-06 point of departure risk" means, and its relation to "potential total cancer risks ranging from [#] to [#]". Also in that section of the [date] letter, what is CHHSL California Human Health Screening Levels and what is the significance?

Answer: The California Human Health Screening Levels (CHHSLs or "Chisels") are concentrations of [#] hazardous chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health". However, the presence of a chemical at a concentration greater than the corresponding CHHSL does not indicate that there are or will be adverse impacts to human health, but suggests that further investigation is warranted. See also answer to previous question.

Reporter's Question: Paragraph b. states a test range of up to [#]. Although I don't yet know what that means, paragraph "c" cites a "highest inhalation risk (of) [#];" would that not be lower than the amount cited in the previous paragraph?

Answer: Yes. Paragraph c states the potential cancer risk from the individual compounds. PCE alone resulted in a calculated potential cancer risk of [#] in [#] people at its highest concentration.

Reporter's Question: The [date] fact sheet is quite helpful, but does not appear to mention 1,2 DCA. However, [date] letter mentions DCA and I'll need to know more about it. For example, although I don't yet understand numbers associated with PCE, at least the letter provides the "point of departure risk" for that contaminant, but no such benchmark is mentioned for DCA.

Answer: The risk is cumulative based on all contaminants detected. The calculated indoor air concentration of 1,2 dichloroethane (1,2-DCA) that is associated with the "point of departure risk" of "1 in a 1,000,000" is [#].

Sample Preparation for a Media Interview

Reporter's Question: Will DTSC pursue sampling of residences west and north of [location], as noted under conclusions and recommendations?

Answer: DTSC's understanding is that USEPA plans to test [#] additional homes [location] as a precaution.

Reporter's Question: What about homes around [location]?

Answer: DTSC is negotiating with the City to address these sites.

Reporter's Question: If the testing was done in [month], why wait until [month] to notify local officials?

Answer: DTSC understands that local officials were notified before indoor air sampling by USEPA, and immediately after the sampling results were obtained. The details on USEPA ERS work including milestones actions and schedule are best obtained from USEPA.

DTSC issued an additional Proposition 65 notification in [date] based on more specific health risk information developed from the results of the sampling conducted by USEPA ERS.

Reporter's Question: Please describe a sub-slab depressurization system. Does it continue to operate here?

Answer: Yes. DTSC's understanding of the sub-slab depressurization systems installed by USEPA is a [system description, e.g., 150 watt exhaust fan/vacuum pump connected to a PVC pipe configuration that creates a slight vacuum barrier under the building footprint preventing chemical vapors from migrating into the building from the subsurface]. For the construction details, please contact (person given earlier) at USEPA.

Reporter's Question: How is indoor air sampling done?

Answer: A vacuum canister with a regulator valve is placed indoors and activated to collect an air sample over a given period, usually 24 hours. The canister is then shipped to a laboratory for analysis and reporting of contaminants of interest.

Reporter's Question: Why were county officials notified? Are they required to do something with the info?

Answer: Proposition 65 requires that DTSC inform public officials when they have knowledge of a chemical release posing a potential health hazard. Questions on the actions the public officials plan to take would be best directed to them. For details on USEPA contact with local officials, please contact [name] of USEPA at [phone number].