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10 Stakeholder Concerns

This topic provides some tools that you can use in communicating with affected property owners or communities with regard to the risks that are specific to petroleum contamination as measured by TPH. The essentials of a community engagement plan are presented and can be tailored to fit most situations. Stakeholder identification and communication should begin as early as possible in the project.

Communicating the risks associated with a petroleum-contaminated site to people unfamiliar with environmental sciences can be difficult. This difficulty is compounded by the nature of TPH relative to indicator compounds; TPH can be measured and quantified, but its composition can change over time and distance (see TPH Fundamentals). This makes communicating the risks associated with contamination as measured by TPH challenging.

Stakeholder concerns associated with TPH investigations have been listed in many publications, including information provided by many state regulatory agencies. These resources commonly cite the following factors to keep in mind when conducting TPH investigations:

- importance of timely communication with the community
- need for sensitivity in, and training for, communicating with the public
- ability to translate and communicate technical information and public health issues into a format that is easily understood by the general public
- sensitivity to other impacts to public property, including property value, access, and private property rights
- need to interact with local organizations and government agencies that may have widely varying responsibilities for, and methods of, dealing with TPH (from inaction to emergency response levels)

As with any environmental site, stakeholders may have questions and concerns related to human health. At TPH sites in particular, gases such as methane may be generated in the subsurface as a byproduct of biodegradation and may require additional communication of risk. Another concern at TPH projects is the potential for public mistrust of the use of modeling to make management decisions, particularly if no investigation is implemented as a result. Terms such as “uncertainty,” when used in the context of modeling, may be questioned as a means to avoid doing additional work or to minimize cost. Stakeholders may also request explanation of how the model works and the assumptions used in modeling.

Property owners are also usually concerned about devaluation of their properties. Generally, property owners and other stakeholders are concerned that remedial actions will be minimized or the implementation schedule extended to reduce costs to the responsible party. At TPH-contaminated sites, stakeholders may have concerns when monitored natural attenuation (MNA) is implemented as the remedy or when TPH is present, but the typical indicator compounds are absent, or if the site has been closed, based on a risk evaluation. This concern may be elevated when MNA is selected as a result of accepted modeling results or site screening specific to petroleum, especially if the results are not verified through future monitoring or sampling.

Sites that have TPH contamination issues can be located in areas that have the potential to affect the public (near residences and commercial establishments, for example). For TPH projects, community stakeholders have many concerns, some of them unique. For instance, stakeholders may have questions or concerns arising from a lack of understanding of TPH biodegradation, including why and how a passive approach will address a TPH problem. The perceived or actual lack of data can create uncertainty that may result in future problems for landowners, tenants, and other stakeholders (during future property transactions, for example).

It is critical to identify all stakeholders involved for a TPH project. In addition to property owners (including their leaseholders and tenants) and other community members, stakeholders that should be kept informed of site activities may include:

- water utilities
- law enforcement
- neighborhood associations
- local government agencies—county and city governments or tribal councils

- health departments and health care providers

It is always best to be as inclusive as possible and reach out to all potentially interested parties through various means of communication. Be aware that varying levels of technical understanding exist within the community and be prepared to communicate at those levels. Outreach may never be 100% successful—despite the investigator's best efforts, some in the community may assert that they were left out of a communications effort or process.

10.1 Community Engagement Plans

10.1.1 Know Your Agency's Policies

Although a variety of material is readily available on community engagement and risk communication, public agency staff should become familiar with their agency's guidance and policies and work closely with community engagement staff, if available. Existing engagement plans or guidance can be tailored to TPH-specific projects.

The purpose of a community engagement plan (CEP) is to explain the process by which site-related information will be provided to the community in a formal and coordinated manner. In many cases, it is the responsible party that prepares the CEP with approval and oversight from the regulatory body. The plan should be tailored to address risk to the community as a whole and to the individuals whose properties may be adversely affected. At the start of the community engagement process, strive for consensus among responsible parties, regulators, and other authorities on appropriate levels of outreach and thoroughly document outreach activities. At a TPH project, information that must be conveyed to the community can be especially complex because of the multiple media affected, and the transport mechanisms involved, and because TPH data are rarely the only mechanism used to evaluate risk. The CEP should be dynamic and allow for additional stakeholders and communication methods to be identified as the project progresses. The information provided to stakeholders should be in simplified terms so that community members without specialized knowledge can understand what to expect regarding communication, investigation, risk, mitigation, and remediation. The CEP should also identify sources of technical assistance for concerned citizens and explain how stakeholders can obtain answers to technical questions.

Ensuring that the community has essential information and access to technical resources will allow community members to develop the understanding needed to make informed decisions related to their personal risk. The CEP is a living document and is most effective when it is created early in the process and updated or revised as new information on site or community conditions becomes available or additional stakeholders are identified.

10.1.2 Elements of a Community Engagement Plan

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CEP development is commonly broken down into three components: basic information, the community profile, and the action plan. The basic information section should contain an introductory discussion of the purpose of the CEP, identify stakeholders, identify agency roles and responsibilities, provide a summary of community concerns, and contain background information on the site or event.

10.1.2.1 Basic Elements of a Community Engagement Plan

Introduction and Schedule

- explains the purpose of the CEP
- lists the agencies with oversight responsibilities
- describes how information was obtained for the CEP
- briefly summarizes the community concerns
- outlines CEP organization
- provides the implementation schedule (internal and external)

Site, Facility, or Event History and Background

An overview of the site, facility, or event that caused the TPH issue, including (at a minimum) details on:

- the location and date of release
- material released
- volume released

- extent and distribution of contaminants
- affected media
- investigative and corrective actions to date
- what the community should expect regarding investigation and mitigation of the TPH issue

Community Profile and Community Assessment Results

- The community profile is usually completed during a preliminary environmental assessment process provided by the responsible party with concurrence from the regulatory agency.
- The baseline community survey evaluates the potential interest in a project. Surveys should be conducted prior to commencement of a TPH investigation, mitigation, or closure process.
- The community concerns section summarizes any concerns identified during the community profile development or baseline community survey.

Objectives of the CEP

- The CEP provides a narrative of the major objectives of the CEP. Objectives typically relate to the specific concerns outlined in the community profile and survey process and may include objectives, such as TPH risk explanation.

Public Involvement Activities

This section describes the specific activities that will be conducted to meet the objectives outlined in the CEP, such as:

- communication methods and activities (for instance, social media sites, TPH fact sheets, notices, meetings, and access agreements)
- timing of the communication activities related to milestones (for example, a planning matrix)
- responsibility for implementing these activities

Appendices

Appendices can be included to provide supporting information or tools to help execute the CEP. Typical appendices may include:

- project mailing list/contact list (the mailing list should not be included within the CEPs that are either distributed to the public or placed in the repository)
- media contacts
- public meeting and information repository locations

Although nomenclature and order of occurrence may vary slightly, the basic elements of a CEP as outlined above are typical of elements that can be found in other guidance documents such as:

- California Department of Toxic Substances Control's (DTSC) Public Participation Manual CAEPA-DTSC 2001
- USEPA Superfund Community Involvement Toolkit and resources therein

Examples of CEPs that follow a USEPA format can be found in the following documents:

- Iron King Mine-Humboldt Smelter Site USEPA 2009b
- Harbor Island Area Superfund Sites USEPA 2009c
- Hudson River USEPA 2009a
- Foster Wheeler Energy Corporation Church Road TCE Site USEPA 2010

10.2 Tools for Effective Community Engagement

Input on communication preferences should be sought from the community. This allows regulators and other environmental professionals the opportunity to identify the most appropriate community engagement tools. These tools can then be added as an appendix to the CEP as appropriate. This subsection describes some community engagement tools.

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10.2.1 Community Advisory Group

One example of a community engagement tool is the development of a community advisory group. The group nomenclature may vary for each project, but the purpose is essentially the same. A community advisory group is a small group of residents interested in, or affected by, a project who meet regularly with regulatory agencies and responsible parties to discuss various aspects and concerns with the project. These residents have no decision-making authority, but can prove influential by providing an opportunity for the public to gain an understanding of the complexities of the TPH investigation and by helping to explain risk and provide constructive advice. Members of the group may aid in gaining access to properties for assessment and mitigation from reluctant property owners. The group may be beneficial for regulatory agency project managers to communicate with property owners to discuss specific concerns and questions. Information on community advisory groups can be found on the USEPA Superfund Community Involvement website USEPA 2013c

10.2.2 Fact Sheets

A second example of a community engagement tool is the fact sheet. Fact sheets can be a useful communication tool and can be easily shared with the community through mailings, door-to-door distribution, websites, information repositories, and community meetings. The subject matter of fact sheets can vary widely, but they generally cover information such as frequently asked questions (FAQs) about TPH, TPH risk, TPH-specific chemicals and behavior, and investigation techniques. Also consider preparing brief summaries of site background and history, investigation findings, and mitigation and remediation plans.

Some resources are presented below:

- California DTSC Vapor Intrusion Public Participation Advisory CAEPA-DTSC 2012b
- USEPA Vapor Intrusion Fact Sheet USEPA 2007c
- Federal Agency for Toxic Substances & Disease Registry (ATSDR) fact sheets on chemical contaminants, such as BTEXN ATSDR 2013
- USEPA fact sheet on bioremediation; contains a basic description of the process of biodegradation USEPA 2012a
- New York State Department of Health Soil Vapor Intrusion FAQ NYDOH 2004
- New Jersey Department of Environmental Protection NJDEP 2008
- Massachusetts Department of Environmental Protection MADEP 2013
- Wisconsin Department of Health Services WIDHS 2013
- Illinois Department of Public Health ILDOH 2009
- Delaware Department of Natural Resources and Environmental Control DENREC 2013
- New Hampshire Department of Environmental Services NHDES 2013

Table 10-1 lists additional community engagement tools.

Table 10-1. Community engagement tools

Community Engagement Tools	
Fact sheets • Investigation findings • Site history • Initial investigation • Ongoing investigation • TPH • Chemicals of concern (COC)	Community meetings • Community advisory groups • Restoration advisory boards
Access agreement guidelines	Community surveys
Work notices	Site diagrams and maps
Flyers, posters, or signage	DVDs
Neighborhood newsletters	Informational inserts
Agency contact lists	Public notices in newspapers
E-mail notices/updates	Information repositories
Websites/social media	Radio, TV informational programs

Community Engagement Tools	
One-on-one or small group meetings • Door-to-door visits • Phone calls	Community events

10.3 Risk Communication

Effective risk communication is an important component of all outreach efforts. To assist in gaining the trust of the public, it is essential to provide clear and understandable descriptions of the issues, including potential risks. If professional communications personnel are available, involve them in the risk communication process. For communicating risks associated with all contaminated sites, not just TPH-related sites, USEPA 1998 provides the following points:

- Accept and involve the public as a legitimate partner.
- Listen to the audience.
- Be honest, frank, and open.
- Coordinate and collaborate with credible sources.
- Meet the needs of the media.
- Speak clearly and with compassion.
- Plan carefully and evaluate performance.

Those involved in communicating the risk posed by TPH should be familiar with TPH concepts, which are discussed more fully in the TPH Fundamentals and Conceptual Site Models sections. Effective risk communication clearly presents these concepts to stakeholders. Additionally, it may be helpful to place potential risks posed by TPH in context with potential risks posed by household products and ambient air.

10.3.1 Communicating the Risk

The goals of effective risk communication include the following Ivens 2010:

- Establish trust and credibility.
- Provide information to enable residents and other stakeholders to make decisions regarding TPH impacts.
- Create open and ongoing lines of communication.
- Secure continued access to buildings for investigation and monitoring.
- Limit risk of legal action.

Avoid overly technical terms in discussing potential risk with the general public. Terms such as “vadose zone,” “probes,” and “10^{-6} excess cancer risk” don’t mean much to nontechnical people; even the concept of “groundwater” may be unfamiliar to some stakeholders. Other terms like “free product” may actually sound good to the public. Table 10-2 provides some examples of technical terms made simpler.

Table 10-2. Technical terms made simpler

Technical Term	Plain Language Term
Plume	Contaminated groundwater
Vadose zone	Soil above the water table
Free product, LNAPL	Fuel not dissolved in water
Saturated zone, aquifer	Groundwater, water table
Probe	Sampling device
Soil permeability	Porous
Volatile	Easily evaporates

Technical Term	Plain Language Term
Biodegradation	A natural process in which bacteria break down organic compounds (such as petroleum) in the soil for energy
Multiple lines of evidence	Using all available information in decision making

10.4 Communicating Risk Associated with TPH

TPH-contaminated sites may be perceived as different from other types of environmental contamination, as previously discussed, which may make answering questions difficult. When communicating with the public on TPH issues, you may encounter many emotions.

The following information is adapted from Two Tools for Responding to Any Difficult Question/Statement on Any Issue from Any Stakeholder in Any Setting, reprinted by the Navy and Marine Corps Health Center US Navy 2011. This brief document provides a "Generic Category Tool for Responding to Challenging Questions," which is a table of 12 categories of challenging questions and the appropriate response for each type of question. When communicating with the public on TPH issues, you may encounter many emotions—anger, confusion, fear, or others. To communicate effectively with an emotional person, four approaches are helpful:

- Empathy: You must try to think like they are thinking. Remove yourself from your own feelings and put yourself in their shoes. Using empathy statements is helpful, but they must be relevant. Saying things such as "I live in this community" or "My child also attends that school" shows the public that you empathize with their situation.
- Conclusion: In risk communication, the conclusion must be short, simple, and precede the facts that support the conclusion. The conclusion should address the underlying point of the question or statement. Examples of good conclusions include the following:
    - "I don't know, but I'll find out."
    - We don't plan further cleanup actions."
    - "The vapors do not pose a significant risk."
    - We've been sharing all the information with you."
- Facts: Facts support your conclusions. Usually one, two, or three facts are sufficient. It is crucial that you observe your audience when giving facts to ensure that they are listening. If they are not listening, stop talking about your facts and find out why they are not listening. Ask:
    - "Am I being clear?"
    - "Do you have any questions or concerns?"
- Future action: Future action, if applicable, should include a timing factor. Whatever your future action is, you should let the stakeholders know that they will continue to be involved and that their continued involvement is important, until their issues have been resolved. Examples of good future action statements are:
    - "I don't know, but I'll call you tomorrow."
    - "I'll be happy to talk to you more after the meeting."
    - "There's more information on this on our website/brochure/fact sheet/Facebook."
    - "We won't know for at least six months, but I'll be glad to call/e-mail once a month on our latest outlook."

10.5 VOCs in Commonly Used Products

When discussing risks associated with TPH, the concept of "background" contamination will likely arise. Including a discussion of common sources of contaminants, especially petroleum compounds, may be helpful. Many household products contain petroleum compounds that can be sources of TPH contamination. The following list

(see Table 10-3) of some common household products that contain petroleum compounds was adapted from two nontechnical websites Schmidt & Clark 2013; eHow 2013. See also ASTDR Tox FAQs

Table 10-3. Common household products that contain petroleum compounds

Common Household Products that Contain Petroleum Compounds
Fuel containers (or devices using gasoline, kerosene, fuel oil, and products with petroleum distillates, lantern fuel)
Paint thinner, oil-based stains and paint, lacquer thinner
Aerosol or liquid insect pest products
Mineral spirits
Furniture polishes
Lighter fluid
Rubber cement
Glues
Lubricants
Blacktop driveway sealer
Furniture refinisher
Adhesive remover
Liquid paint stripper
Vaseline, lip balm, cosmetics
Carburetor cleaner
Fuel injector cleaner (aerosol or liquid)
Aerosol waxes
Brake cleaners
Liquid stainless-steel cleaner
Herbicides
Styrofoam

It may be helpful to develop a fact sheet to effectively communicate information regarding common household products that contain petroleum compounds. One example of this type of communication is the New York Department of Health Fact Sheet on Volatile Organic Compounds in Commonly Used Products NYDOH 2007.

10.6 Public Notification of Sampling

Owners and tenants of buildings to be sampled should be notified in advance of sampling activities. While respecting the privacy of property owners and tenants, as appropriate, also notify the surrounding community of pending sampling. Individual letters, fact sheets, and other appropriate materials stating that sampling is planned and explaining how and when the sampling will occur should be mailed to owners, tenants, and the community.

Owners of private property, and tenants and leaseholders in many instances, have the right to deny access to private property. In cases where the public welfare is at stake, access to private property may be gained through other means (such as legal action). It is often easier to attempt to collect data from adjacent public areas or rights-of-way, if possible and appropriate, rather than engage in protracted legal battles that can have negative consequences in the public domain.

Any data generated from sampling should be provided to individual owners, tenants, and other stakeholders, as appropriate. State regulatory agencies may have specific guidelines or regulations on the transmittal of data to the public. Once any data are submitted to a governmental regulatory agency, it may be considered an open public record that must be provided to any individual requesting that information under public law. Private property data being open to any and all public review may be one reason why property owners, sometimes at the urging of their legal counsel, are reluctant to allow sampling to be conducted on their property.

10.7 TPH Concepts Explained

Other portions of this guidance provide in-depth details of TPH concepts and serve as a resource for understanding TPH. Some difficult concepts, however, may require additional explanation in a nontechnical format for nontechnical readers. This section focuses on explaining those concepts in simple terms for the benefit of nontechnical stakeholders, managers, and regulators.

▼*Read more*

10.7.1 Contaminants of Concern and Key Indicator Compounds

Indicator compounds are common to many types of petroleum products or associated with a specific site and found within the typical ranges of TPH analyses. Depending on the types of petroleum products being discussed, these contaminants or contaminant groups are relevant because they are the specific compounds sought when investigating petroleum-contaminated sites and evaluating risk and they tend to have well-established toxicity data.

These specific chemicals of concern (COCs) are listed by the federal government. State and federal agencies typically require that samples collected at petroleum sites are analyzed by laboratories for these specific COCs.

COCs in TPH investigations include the following:

- BTEX—This group of hydrocarbon compounds is a common constituent of gasoline and most other light- to medium-weight PHCs. The common occurrence of BTEX compounds, along with attributes such as toxicity, volatility, and solubility, make them primary indicators of gasoline. Benzene is the highest priority of the BTEX group because it is a known human carcinogen (cancer-causing agent) and has relatively high mobility in the environment.
- Naphthalene(s)—A compound, or group of compounds, commonly occurring in diesel fuel and heating oil and found during TPH investigations. Naphthalene is also in gasoline, jet fuel, and kerosene (~0.2%) and in diesel fuel (~0.05% or less) Shafer 2011

10.7.2 Biodegradation

Biodegradation may be defined as the “transformation of a substance into new compounds through biochemical reactions or the actions of microorganisms such as bacteria” USGS 2013, or “a process by which microbial organisms transform or alter (through metabolic or enzymatic action) the structure of chemicals introduced into the environment” USEPA 2013a. Most stakeholders, however, require a much simpler explanation, and the process can be simply described as “microbes eating or using the petroleum compounds.”

The key message to stakeholders about TPH in the environment is that it is biodegraded by naturally occurring soil microbes. When oxygen is available, these microbes can usually degrade TPH to nontoxic compounds (such as carbon dioxide and water) at a higher rate than when oxygen is absent, although careful evaluation is necessary to accurately predict the rate of biodegradation.

10.7.3 Conceptual Site Models

CSMs are simplified versions of complex systems and are “an important tool for organizing information about the current state of knowledge and understanding of the problem” USEPA 2006. CSMs created to describe contaminated sites to nontechnical stakeholders are typically represented in a simplified diagram.

CSMs commonly break down complex systems into their basic components and then describe the relationships between these components. Diagrams typically depict the source of contaminant(s), environmental media (soil, groundwater, air) through which the contaminant travels, and the receptor(s). The graphical model typically uses a simple indication, such as arrows, to show how contaminants move from the source, through the environmental media, and toward the receptor.

10.7.4 Multiple Lines of Evidence

When evaluating complex relationships between groundwater, soil, soil gas, and air, decisions cannot be made on any single simple fact, procedure, or data point. Investigators must gather, evaluate, and weigh different types of data and information. Thus, multiple independent sources of information, often termed “lines of evidence,” must be evaluated to determine whether TPH poses a risk of exposure.

Assessments of all available lines of evidence are recommended before drawing conclusions about the exposure risks. ITRC vapor intrusion guidance recommends collecting multiple lines of evidence to evaluate the risk of exposure to TPH-contaminated media. The concept of multiple lines of evidence includes the collection of information from different media (groundwater, soil gas, indoor air, outdoor air) and by different methods (such as modeling, chemical analysis, and spatial associations). If the weight of evidence points to the same scenario, then the reliability of that scenario is supported and uncertainty is reduced.

10.7.5 Site Investigation Process

The site investigation process can be defined for nontechnical audiences as the determination of the level (concentration) and extent (size) of contamination. For TPH, this definition can be further restricted as the level and extent of TPH contamination in the environment. Through the collection and analysis of data, the site investigation process attempts to describe some factors that are important for understanding site conditions, including:

- nature and extent of impacts
- biodegradation influences
- geologic and hydrogeologic characteristics
- building characteristics
- vapor source characteristics
- spatial and temporal variability of concentrations in and beneath structures
- evaluation of exposure pathways and receptors

Stakeholders should be informed about the scope of the investigations and the results of the samples collected. Stakeholders may be reassured to know that multiple lines of evidence are used for project decisions and that data from more than one source, or obtained by more than one method, are used to determine whether public health is adequately protected or whether no health threat exists. Communications should stress the variety of environmental media that may be sampled and stress that modeling is just one part of an assessment.

10.7.6 Modeling/Risk Calculations

All models are simplifications of complex systems. In the simplest terms, modeling requires the input of certain site information into the model, which then mathematically evaluates that information and produces output describing the site. For TPH modeling, computer models are used to predict the behavior of chemical ranges in the environment. Using models can help to predict where TPH contamination might (or might not) occur and, if so, in what quantity.

Models may also be used to predict the maximum extent of TPH. Regulators and other environmental professionals can use the model results to focus TPH investigations where resources are needed most and to provide boundaries outside of which little or no sampling is required. Models are updated as more TPH information becomes available.