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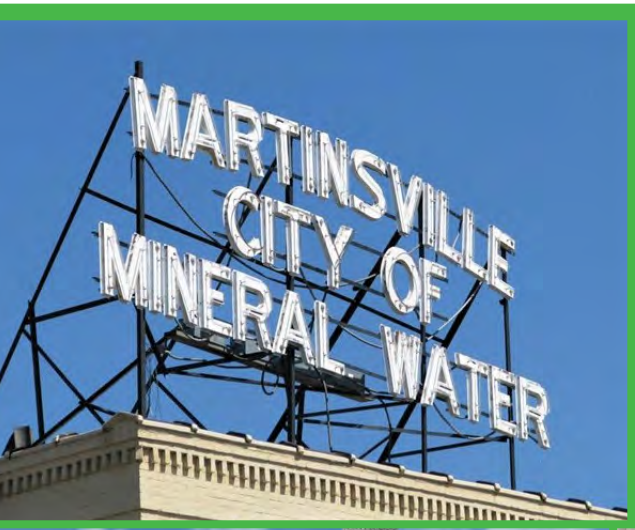
Pike and Mulberry Streets PCE Plume Superfund Site

City of Martinsville,
Morgan County, Indiana

Community Involvement Plan



August 2019

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Table of Contents

Appendices

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Section 1
INTRODUCTION

*Words appearing in **bold** are defined in Appendix A.*

The U.S. Environmental Protection Agency prepared this **Community Involvement Plan**, or **CIP**, to engage with and support the community affected by the Pike and Mulberry Streets PCE Plume **Superfund** site in the City of Martinsville, Indiana.

This plan provides information about current community concerns, presenting an outline to enhance communication between residents and the **EPA** as the investigation and **cleanup** of the site progresses. The CIP also provides background information about the site and recommends ongoing activities for EPA to assist with informing the public throughout the project lifecycle.

EPA wants the members of this community to know and understand how they can participate in the decision-making process during cleanup activities at this site. EPA is committed to promoting effective and meaningful communication with citizens and wants to make sure resident concerns and information needs are considered as activities in the site's progress.

To put this plan together, EPA interviewed community members, local officials, and other stakeholders in April 2019. Interview findings, combined with our experiences in the community, guided the development of this CIP.

This CIP describes EPA's plan for addressing community concerns to keep residents informed and involved. We will use this document as a guide to communicate with and involve residents, businesses, neighborhood organizations, and local government in the Martinsville area.

What is a CIP?

A Community Involvement Plan is a working document used to assist communication between community members and EPA. The document outlines opportunities for individual participation and meaningful information-sharing regarding EPA activities at the Pike and Mulberry Streets PCE Plume site. The CIP is also a tool for the public to use to make sure EPA is responsive to their needs and concerns.

The CIP is the foundation of EPA's Superfund Community Involvement and Outreach Program.

EPA Wants Your Input:

If community members have suggestions, questions, or would like more information about the cleanup, they can contact:

Kirstin Safakas
Community Involvement Coordinator
EPA Region 5 (RE-6J)
77 W. Jackson Blvd.
Chicago, IL 60604-3507
Safakas.Kirstin@epa.gov
312-886-6015
or 800-621-8431, ext. 66015

Community engagement is essential to the success of Superfund site cleanup activities.

Ongoing input and involvement with the community is essential to our efforts to provide effective **community engagement**. We have learned that the Agency's decision-making ability is only greater enhanced by actively seeking feedback from the community. Residents, business owners, and local government officials may provide us valuable information about a site and the effectiveness of a cleanup; therefore EPA encourages locals to be involved in all phases of the project. Community input can help identify where **contamination** might still remain, how people may still be exposed to it, potential sources of the contamination, and any problems associated with EPA's cleanup method.

There is nothing more important than working with the public on projects that impact your neighborhoods and way of life! Community Involvement Coordinators are here to be your advocate throughout the Superfund process.

Community Involvement Goals

- Help community members understand their role in the decision-making process during project design and cleanup.
- Respond to community questions, concerns, and requests for information.
- Give the public accurate and understandable information about the cleanup as it progresses.
- Ensure community members receive ample time and opportunity to give meaningful input.
- Respect and fully consider public feedback as the project moves forward.
- Adjust and adapt to community needs based on continued interaction with residents.

Section 2

THE COMMUNITY

Community Profile

Martinsville is the county seat of Morgan County in the State of Indiana. The city is about 30 miles southwest of Indianapolis and about 20 miles northeast of Bloomington. Martinsville was founded in 1822 and is currently governed by a mayor and city council.

Martinsville grew significantly in the 1800's due to pork trade, with its industrial boom spanning from 1890 to 1940. The city's largest single employer during this period was the Old Hickory Company, which produced rustic hickory furniture.

Martinsville City Hall

Grassyfork Fisheries was established in 1899 and is the oldest continuously operated private fish farm in the United States. Sold to Ozark Fisheries in 1970, this fishery at one time produced 75 percent of the goldfish in the United States. Because of this, Martinsville acquired the nickname "Goldfish Capital of the World." The fishery now serves as a goldfish and koi production and shipping facility for six varieties of goldfish and two varieties of koi.

The best-known industry in Martinsville's history is its water. Artesian mineral water was discovered in Martinsville in the late 1800's by Sylvanus Barnard while he was drilling for natural gas, and his discovery helped the city become home to some of the nation's leading health spas. At one time, Martinsville had 12 different sanitariums. People in search of mental or physical comfort frequented the sanitariums, which were all located around artesian mineral water springs that many believed possessed healing properties. The last mineral water sanitarium closed in 1968.

Sun Parlor in Martinsville Sanitorium.
Source: Indiana Historical Society.

A technology-based industry, Twigg Industries, came to Martinsville in 1957. Twigg has supplied fabrications for both military and commercial aerospace firms for more than 40 years. Harman-Motive, later Harman-Becker, a manufacturer of automotive speakers, came to Martinsville in 1981. Serving as Martinsville's largest industry for many years, the Martinsville plant closed in 2009.

Currently, Martinsville has a range of different businesses including locally-owned restaurants and shops. There are also numerous schools in town, including five elementary schools, two middle schools, and a high school. The Metropolitan School District of Martinsville manages said public schools. Martinsville houses a police department, a fire department, and the main branch of the Morgan County Public Library. Numerous churches are also within city limits.

Martinsville also has numerous community groups such as the Lions Club and Rotary Club. The town hosts several community events including the Fall Foliage Festival, a weekly Farmer's Market Day in the summer, and the Morgan County Fair. The Art Sanctuary in Martinsville serves as a cultural environment to engage the community in the arts.

The Martinsville Parks Board oversees four parks: Jimmy Nash City Park, Doris Daily Park, Victory Park, and Walter Martin Park. The Jimmy Nash City Park sits on a 40-acre site, containing a public pool and winter sledding hill.

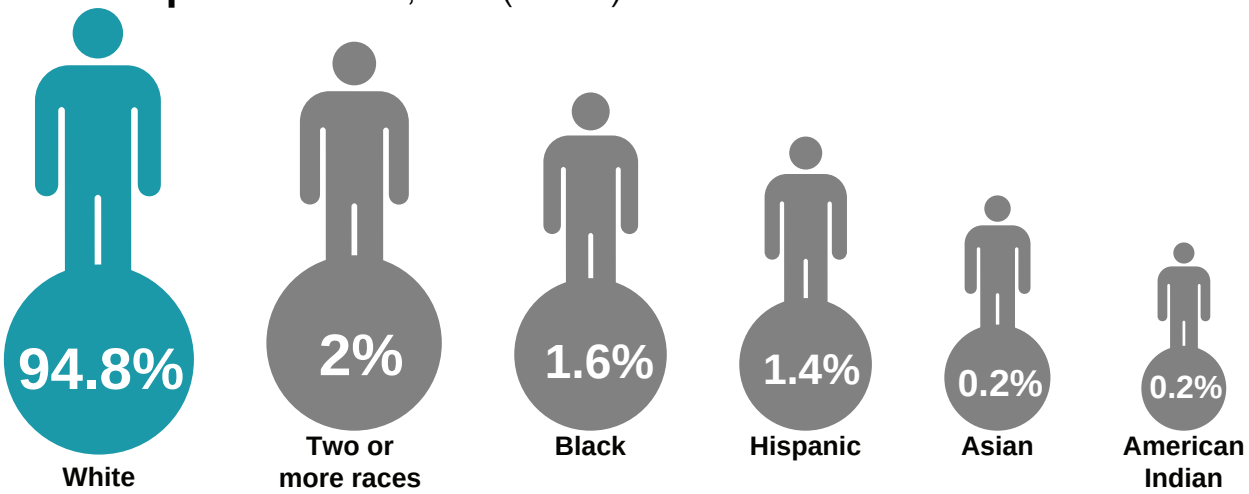
Jimmy Nash City Park

Demographics

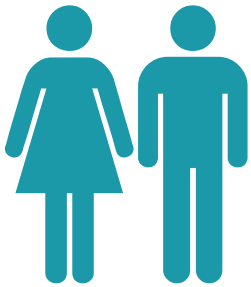
According to the U.S. Census Bureau, the 2010 population of Martinsville was 11,828. The following demographic information shows additional statistics about Martinsville.

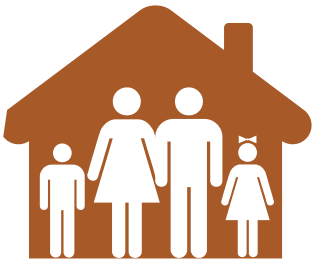
Martinsville Demographics

Total Population: 11,828 (2010)



Median Resident Age: 40.5 years old



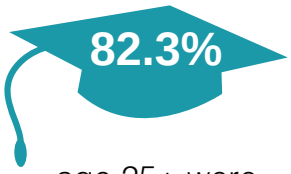


21.6% residents living in poverty

$96,300 median home value

$689 median rent

52.9% owner-occupied housing units



age 25+ were high school gaduates

had a bachelor's degree or higher

$42,092 median income (2017)

$20,753 per capita income (2017)

Source of demographic data unless otherwise noted:
www.census.gov/quickfacts/fact/table/martinsvillecityindiana (2013-2017)
**www.city-data.com/city/Martinsville-Indiana.html*

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Section 3

SITE OVERVIEW

Location and Site Features

The Pike and Mulberry Streets PCE Plume site is located in the city of Martinsville in Morgan County, Indiana. It is primarily a 38-acre **groundwater plume** contaminated with the toxic **volatile organic compound (VOC) tetrachloroethylene**, also known as **perchloroethylene**, or **PCE**. A groundwater plume is a mass of contaminated underground water that often moves slowly. The plume is centered near the intersection of Pike and Mulberry Streets in Martinsville.

Site Background

History

The area identified as one of the potential sources of contamination is 28 N. Main Street, where the former Master Wear, Inc. dry-cleaner operated from 1986 to 1991. Its industrial operations included laundering and dry-cleaning using PCE for commercial and institutional organizations. Between 1987 and 1991, multiple complaints of illegal dumping and mishandling of waste drums at the facility were reported to the **Indiana Department of Environmental Management**, or **IDEM**.

EPA believes this facility is the main source of PCE to the site as several other spills and releases were also reported. Other industries and businesses, including several dry-cleaning facilities that operated historically in Martinsville, have also been identified as potential sources of PCE and other contaminants.

The contaminant plume at this site extends to the city's municipal wellfield and drinking water plant. This well field is used by the city of Martinsville for its public drinking water supply and serves about 15,000 people. The city has been treating its drinking water using activated carbon filtration since 2005 to remove PCE and other

chemicals. However, the activated carbon treatment required to remove PCE from the water has been needing to be changed more frequently.

Cleanup Progress

EPA and IDEM have performed various investigations in the past. EPA conducted a **Time Critical Removal Action**, or **TCRA**, from 2003 to 2008 at the facility to address contamination in soil, groundwater, and soil vapor. A TCRA is a removal action where, based on a site evaluation, on-site activities must be initiated within six months of a determination that a threat to public health or the environment is imminent.

The removal action included installing treatment systems that used pressurized air and vacuum systems to remove contaminated gases in the source area. Individual buildings threatened by **vapor intrusion** and contaminated groundwater were also treated by installing sub-slab depressurization systems. These systems started operating in 2005 and were turned off in 2008 since indoor air, soil, and groundwater sample results showed that closure criteria had been met.

In 2010, groundwater testing indicated the PCE concentrations had increased again. PCE in samples from the municipal wellfield (before carbon treatment) had also increased since the shutdown of the soil treatment systems. These high concentrations of PCE were the reason that EPA placed the site on the Superfund program's **National Priorities List** in May 2013.

EPA conducted a cleanup investigation from April 2015 through January 2017. Groundwater, soil, and soil vapor samples were collected and tested for **volatile organic compounds**, or **VOCs** (contaminants that evaporate into the air). EPA also conducted a vapor intrusion investigation where sub-slab soil vapor, crawlspace air, and indoor air samples were collected. The investigation included human health risk assessments. PCE and **trichloroethylene**, or **TCE**, were found in groundwater, soil vapor, and/or indoor air at some residential and commercial properties.

A study of cleanup alternatives and goals for the site was recently completed. A report detailing the findings of this study is expected to be finalized in 2019.

The Agency for Toxic Substances and Disease Registry (ATSDR) issued a **Health Consultation** for public comment in March 2019 for the site. This report explains ATSDR's findings about people's exposure to PCE and TCE in drinking water and indoor air and presents

For more information on PCE and TCE , visit *https://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=264&tid=48* or *https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=30*

Canister used to collect indoor air samples inside a house.

Canisters like this were placed in basements to collect sub-slab air samples.

Section 4

COMMUNITY NEEDS & CONCERNS

Summary of Community Interviews

To better understand the community and its concerns related to the Pike and Mulberry Streets PCE Plume site, EPA representatives conducted community interviews in 2015 and again in 2019. People interviewed included residents and local officials from Martinsville and Morgan County who were asked to share their thoughts and concerns about the site. EPA also asked about the community involvement process – what was and was not working – and requested suggestions on how the process could be improved.

Some of the same concerns noted in the 2015 community interviews were discussed again in 2019, such as water quality, air quality, the movement of the plume and future redevelopment.

Please note: *This summary is intended to faithfully record and reflect issues and concerns expressed to EPA by residents and local officials on the days of the community interviews. By necessity, this is a collection of opinions, thoughts and feelings. Therefore, be cautioned that the statements contained in this section may or may not be factual, and that the opinions and concerns expressed are those of individual interviewees alone.*

General Concerns About the Site

Water Quality

The biggest concern mentioned during the interviews was water quality. Most people interviewed knew that the City of Martinsville treats their drinking water with a carbon filtration system; however, there were some residents that said they did not trust the safety of the drinking water. A few interviewees stated that they were unsure if the city was doing a sufficient job in making sure the water was safe. Some mentioned that they felt there was a lack of trust between the residents and the city.

Some residents were concerned about whether they should drink from private wells.

Air Quality

Several interviewees were concerned about the air quality in their basements. Some residents had asked the city about air quality and if EPA was going to do any further testing.

Plume

Several people asked about the contaminant plume – they wanted to know if it was moving, and if so, in what direction. They were also concerned that there may be another plume converging into this plume, coming from another site.

Redevelopment

Several business owners and residents said they were concerned about future redevelopment plans and if the contamination would destabilize conditions in town. They also asked if EPA had talked with local developers.

Health Effects

Long-term exposure was mentioned as a concern by a few residents who grew up in Martinsville. Several people mentioned they recently heard there were high cancer rates. Other interviewees asked about whether the Morgan County Health Department had been involved with this site.

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Section 5

ACTION PLAN FOR COMMUNITY INVOLVEMENT

Community members can provide input at any time by contacting EPA staff.

Maintain Points of Contact

EPA will host meetings, **availability sessions**, and open houses to present new information to the community. These are an opportunity for EPA to present specific information and a proposed course of action, while also giving community members time to ask questions and share feedback. EPA's toll-free telephone number and the project point of contacts will be included on all community involvement material.

Kirstin Safakas
Community Involvement Coordinator
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Phone: 312-866-6015 or
Toll-free: 800-621-8431, ext. 66015

Erik Hardin
Remedial Project Manager
Hardin.Erik@epa.gov
Phone: 312-886-2402
Toll-free: 800-621-8431, ext. 62402

EPA may hold these informal meetings when necessary, where residents can meet EPA experts one-on-one to discuss the activities at the site. These types of meetings—availability sessions and open houses—allow community members an opportunity to express their concerns and ask questions of EPA, state, or local government officials. Public meetings can be held at various times throughout the investigation and cleanup process. A meeting is typically scheduled when there are technical milestones, or the community has expressed an interest in having an event. EPA will consider conducting additional meetings at various times and locations throughout the community to give all residents an opportunity to attend as needed; possible meeting spots suggested by interviewees are listed in Appendix B.

These public meetings are not considered a **public hearing** where testimony is received. A public hearing is a formal meeting where EPA officials hear the public's views and concerns about an EPA action or proposal. There are specific regulations about when EPA is required to consider such comments when evaluating its actions. Public hearings are recorded by a professional transcriber and become part of the Administrative Record. The comments are also posted on the EPA website.

Continue Communication

Many community members expressed that they prefer to receive written communications from EPA. A list of residents, organizations, and local government contacts has been established and will be used for mailing fact sheets, site updates, and invitations to public events. The list will be updated regularly to reflect changes in addresses and elected officials as well as to add new information. The mailing list is for EPA use only and is not shared with outside entities. Anyone interested in being placed on the mailing list can be added by contacting the Community Involvement Coordinator.

Hold Public Meetings

These meetings are opportunities for EPA staff and community members to interact face-to-face. Agency staff is able to discuss residents' concerns and answer questions about the site while building working relationships. EPA will host public meetings to update the community on site activities, in addition to periodically attending local gatherings, such as township or neighborhood association meetings. Community members are welcome to contact the Community Involvement Coordinator if they would like EPA staff to attend or present at one of their meetings or events.

Develop Fact Sheets

EPA will prepare and distribute fact sheets, letters, and site updates that summarize current information about the site and describe upcoming activities to those on the mailing list. These documents are written in non-technical language and typically coincide with important site activities. Fact sheets will be mailed out to inform the public about upcoming meetings and cleanup information. Fact sheets give the community detailed information in a relatively quick, easy-to-understand format. Fact sheets can be found at the **information repositories** and on EPA's website, listed below.

Keep EPA Website Updated

EPA has set up a website that contains regular updates about the site and cleanup information. The website also has information about upcoming meetings, fact sheets, news releases, and technical documents pertaining to this site.

www.epa.gov/superfund/pike-mulberry-pce

Inform Local Media

EPA will prepare and release public notices to the local newspapers, sharing information about site investigation findings, completion of major milestones, significant scheduling information, and other pertinent site-related updates. News releases allow EPA to reach large audiences quickly and will be posted on EPA's website.

EPA typically publishes news releases and public notices to announce public comment periods, meetings, and project milestones such the selection of a cleanup plan. Some people we interviewed said placing an advertisement in the local newspaper – *The Reporter-Times* – was a good way to reach residents. EPA will continue to publish notices in this newspaper.

Many interviewees stated that in addition to newspaper advertisements, they felt another way to reach people would be to put an announcement on the local radio station (*WCBK-FM-102.3*), or to use social media outlets such as Facebook. The city of Martinsville has its own website along with separate sites for its various departments (i.e., fire and police, water, planning departments, etc.). Other popular local groups/podcasts include Porch Time, WATCHCAT, and Martinsville Live.

Maintain Information Repositories

EPA has set up a local information repository for the site, giving residents local access to site-related data. A repository is a collection of site information available to the public for reading and photocopying. Documents available include fact sheets, technical reports, this CIP, and general Superfund information. EPA adds new documents about the site as the documents become available. The information repositories are located at the Morgan County Public Library and at the EPA Region 5 Superfund Records Center in Chicago.

An online information repository, also known as the **Administrative Record**, is available on EPA's website and will be updated as necessary. The Administrative Record gives residents a paper trail of all formal documents EPA utilized to reach decisions about the cleanup.

More information, including addresses, can be found in Appendix B.

To meet the needs of the community and EPA's federal requirements, we have established the following objectives for community involvement:

- Enlist the support, coordination, and involvement of local officials and community leaders.
- Monitor community interest in the site and respond accordingly.
- Keep the community informed of ongoing and planned site activities.
- Explain technical site activities and findings in an understandable format.
- Get public input on key decisions.
- Change planned activities, where warranted, based on community input.
- Update EPA's website regularly with useful information for the community.
- Hold public meetings, when necessary, giving all residents an opportunity to attend.

Evaluate and Adapt

This CIP was designed to comply with federal requirements, while considering site- and community-specific factors. The objectives of community involvement

for the site and the specific activities to address these objectives are based, to a large extent, on information obtained during the 2015 and 2019 community interviews. EPA recognizes that changes in community perceptions, information needs, and population demographics can occur over time, and with that this CIP may require a revision. To determine whether the activities in this plan are achieving their intended objectives, EPA will conduct periodic reviews to determine whether other activities are needed or whether changes to current methods are necessary. As the needs of the community change, EPA will modify the community involvement strategies and address them in a CIP revision.

Available Assistance

Community Advisory Groups

A Superfund **Community Advisory Group,** or **CAG**, is made up of members of the community and is designed to serve as the focal point for the exchange of information between the local community, EPA, and other agencies involved in cleanup of the Superfund site.

More information on CAGs can be found at www.epa.gov/superfund/community-advisory-groups.

A CAG is made up of people representing the community's diverse interests. Its purpose is to provide a space for community members to present and discuss their concerns related to the Superfund decision-making process. A CAG can assist EPA in making informed decisions on how to clean up a site. It offers EPA a unique opportunity to hear and consider community preferences for site cleanup and **remediation**.

Superfund site CAGs generally meet monthly and serve as a public forum. At CAG meetings, interested parties can learn about site cleanup and discuss their needs and concerns. CAG members will absorb the input and develop community-based recommendations related to the Superfund decision-making process with the appropriate government agencies.

CAGs are an important tool for public involvement at Superfund sites both for EPA and the community. However, it will not replace EPA's obligation to inform and involve the entire area through regular as well as innovative community involvement activities.

EPA does not directly establish or control CAGs. However, the Agency will assist the community with administrative support in how to organize the group and help the CAG to engage on issues relevant to the Superfund site cleanup and decision-making process. The community will have the lead role in determining the membership appropriate for its CAG; it should be as inclusive as possible and reflect the composition and diversity of interests of the population living near the site. EPA must certify the CAG is representative of the different interests in the community.

Technical Assistance for Communities

The national **Technical Assistance Services for Communities**, or **TASC**, program provides independent assistance through an EPA contract to help communities better understand the science, regulations, and policies related to environmental issues and EPA actions. Under the TASC contract, a contractor provides scientists, engineers and other professionals to review and explain information to communities.

The services are determined on a project-specific basis and are provided at no cost to communities. This assistance supports community efforts to get more involved and work productively with EPA to address environmental issues.

For more information about TASC, visit: www.epa.gov/superfund/technical-assistance-services-communities-tasc-program.

Technical Assistance Grant Program

A **Technical Assistance Grant**, or **TAG**, helps communities participate in Superfund cleanup decision making. TAG provides funding to community groups to contract their own technical advisor to interpret and explain technical reports, site conditions, and EPA's proposed cleanup proposals and decisions. An initial grant up to $50,000 is available to qualified community groups.

For more information about TAGs, visit: www.epa.gov/superfund/technical-assistance-grant-tag-program.

Contact EPA's Community Involvement Coordinator if you are interested in learning more about a CAG, TASC, or TAG.

Timeframe for conducting community involvement activities

The following table presents the general timeframe for the activities described above.

Community involvement activities	Timeframe
Establish a toll-free number	Completed
Maintain points of contact	Ongoing
Continue communication	Ongoing
Hold public meetings	As needed
Develop fact sheets	As needed
Keep EPA website updated	Ongoing; update as needed
Inform local media	As needed
Maintain information repositories	Completed; update as needed
Evaluate and adapt	Periodically throughout the process

Throughout the investigation, EPA's Community Involvement Coordinator and Remedial Project Manager, will respond to questions and concerns from those interested in the site. They will also be available to speak to local citizen groups upon request. EPA's toll-free telephone number and Ms. Safakas' and Mr. Hardin's direct numbers and email addresses will be included on all community involvement material and email correspondence.

Appendices

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Appendix A

Glossary of Terms

Administrative Record. The body of documents that forms the basis for the selection of a particular response at a site. For example, the Administrative Record for the cleanup plan includes all documents that were considered or relied upon to select the remedy through the Record of Decision.

Availability Session. An open-house style meeting where people can meet and talk one-on-one with EPA staff.

CAG. See Community Advisory Group.

CERCLA. See Comprehensive Environmental Response, Compensation and Liability Act.

CIC. See Community Involvement Coordinator.

CIP. See Community Involvement Plan.

Cleanup. Actions taken to deal with a release or threat of release of a hazardous substance that could affect people and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms "remedial action," "remediation," "removal action," "response action," or "corrective action."

Community Advisory Group. A committee, task force, or board made up of residents affected by a hazardous waste site. CAGs provide a public forum for community members to present and discuss their needs and concerns about the decision-making process at sites affecting them.

Community Engagement. The process of involving communities in all phases of the cleanup process. Communities are asked to provide input on how the cleanup will be conducted and how it may affect community plans and goals.

Community Involvement. The term used by EPA to identify its process for engaging in discussion and collaboration with communities affected by Superfund sites. EPA community involvement is founded on the belief that people have a right to know what the Agency is doing in their community and have a say in the work. Its purpose is to give people the opportunity to become involved in the Agency's activities and to help shape the decisions being made about the site.

Community Involvement Coordinator. The EPA official whose lead responsibility is to involve and inform the public about the Superfund process and response actions in accordance with the interactive community involvement requirements set forth in the National Oil and Hazardous Substances Pollution Contingency Plan.

Community Involvement Plan. A plan that outlines specific community involvement activities that occur during the investigation and cleanup at the site. The CIP outlines how EPA will keep the public informed of work at the site and the ways in which residents can review and comment on decisions that may affect the final actions at the site. The document is available in the site's information repository maintained by the EPA. The CIP may be modified as necessary to respond to changes in community concerns, information needs and activities.

Comprehensive Environmental Response, Compensation, and Liability Act. A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. Commonly known as Superfund, CERCLA is intended to protect people's health and the environment by investigating and cleaning up abandoned or uncontrolled hazardous waste sites. Under the program, the EPA can either:

» Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to do the work; or

» Take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

Contamination. Introduction of harmful microorganisms, chemicals, toxic substances, wastes or wastewater into air, water, or soil in amounts that make the air, water, or soil unfit to use.

Emergency Response Action. A quick response to immediate threats from hazardous substances. The first priority is to eliminate dangers to the public by making sites safe for those who live or work nearby. Emergency response actions are quick, relatively low-cost activities that address substantial threats from hazardous substances. Typical situations requiring emergency response actions

include chemical fires or explosions, threats to people from exposure to hazardous substances, or contamination of the drinking water supply.

EPA. U.S. Environmental Protection Agency.

Groundwater. An environmental term for an underground supply of fresh water.

Health Consultation. A verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material. Consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members.

IDEM. See Indiana Department of Environmental Management.

Indiana Department of Environmental Management. State agency specializing in air, land, pollution prevention and water quality issues, whose mission is to implement federal and state regulations to protect people's health and the environment.

Information Repository. A file containing current information, technical reports and reference documents about a site. The information repository is located in a public building convenient for local residents such as a public school, town hall or library.

National Priorities List. The EPA's list of serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The list is based primarily on the score a site receives from the Hazard Ranking System. The EPA is required to update the National Priorities List at least once a year.

NPL. See National Priorities List.

PCE. See Tetrachloroethylene.

Plume. A visible or measurable mass of contaminated underground water that often moves.

Preliminary Assessment/Site Investigation. The PA/SI is the process of collecting and reviewing available information about a known or suspected hazardous waste site or release. The PA/SI usually includes a visit to the site.

Public Hearing. The main purpose of most public hearings is for the EPA to obtain testimony or comment and not to address substantial matters, although the hearing is also a public meeting and may occur during a more general public meeting. Formal hearings usually involve the use of a court reporter to record a transcript of the testimony or comments. In the Superfund process, formal public hearings are required only for the proposed plan and Record of Decision amendments.

Record of Decision. A ROD is a legal, technical, and public document that explains which cleanup alternative will be used at a Superfund NPL site. The ROD is based on information and technical analysis generated during the Remedial Investigation and Feasibility Study and consideration of public comments or concerns.

Remedial Design/Remedial Action. Remedial design is a phase in the CERCLA response process in which technical drawings are developed for the chosen remedy, costs for implementing the remedy are estimated and roles and responsibilities of EPA, states and contractors are determined. During the remedial action phase, the remedy is implemented generally by a contractor, with oversight and inspection conducted by EPA, the state or both.

Remedial Investigation/Feasibility Study. The Remedial Investigation is a study designed to collect the data necessary to determine the nature and extent of contamination at a site. The Feasibility Study is an analysis of the practicality of a proposal—e.g., a description and analysis of potential cleanup alternatives for a site on the National Priorities List. The Feasibility Study recommends a selection of an alternative, and usually starts as soon as the Remedial Investigation is under way; together, they are commonly referred to as the RI/FS.

Remedial Project Manager. EPA official who is the technical lead on a project.

Remediation. The action of reversing or stopping environmental damage.

ROD. See Record of Decision.

Superfund. The program operated under the legislative authority of CERCLA that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority and conducting and/or supervising cleanup or other actions.

TAG. See Technical Assistance Grant.

TASC. See Technical Assistance Services for Communities.

TCE. See Trichloroethylene.

TCRA. See Time-Critical Removal Action.

Technical Assistance Grant. Funding provided by EPA for a technical advisor to interpret and explain technical reports, site conditions, cleanup proposals and decisions to a community.

Technical Assistance Services for Communities. A program that provides independent assistance through an EPA contract to help communities better understand the science, regulations, and policies related to environmental issues and EPA actions.

Tetrachloroethylene. A chemical, also referred to as PCE, used mainly as a solvent for dry cleaning and metal degreasing but is also found in paint strippers and spot removers. It is a colorless liquid with a sweet odor. PCE is slow to break down in water but evaporates quickly from water into air, where it also then breaks down slowly. Therefore, it can be transported long distances in the air. PCE may filter through the soil and into the groundwater below where it is generally slow to break down as well. Exposure to PCE is most commonly through breathing air that has PCE vapors or drinking and showering contaminated water. Long-term exposure to this chemical is suspected of causing cancer, as well as problems of the liver and kidneys. More information can be found on the following website: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=264&tid=48.

Time-Critical Removal Action. Removal action where on-site activities must begin within six months of determination by a site evaluation that the threat to public health or welfare of the environment is imminent.

Trichloroethylene. A chemical which is used as a solvent to remove oils and grease from metal products and is found in adhesives, paint removers, typewriter correction fluids, and spot removers. TCE, a colorless liquid, is a manufactured substance that does not occur naturally in the environment. It has an odor similar to ether. It minimally dissolves in water and can remain in groundwater for a long time. TCE evaporates from surface water and soil, although it evaporates less easily from soil. Exposure from TCE is most commonly through breathing air that has TCE vapors, drinking or showering in contaminated water, or direct contact with contaminated soil. Long-term exposure to this chemical is suspected of causing cancer as well as problems with the liver and weakening of the immune system. More information can be found on the following website: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=172&tid=30.

Vapor intrusion. Occurs when underground pollutants release chemical vapors that travel up through the soil and accumulate beneath building foundations. Air in the building becomes polluted when vapors enter through cracks or holes in foundations and crawl spaces.

VOCS. See Volatile Organic Compounds.

Volatile Organic Compounds. A type of organic compound that tends to change from a liquid to a gas at low temperatures when exposed to air. As a result, VOCs disappear more rapidly from surface water than from groundwater. Since groundwater does not come into contact with air, VOCs are not easily released and can remain in groundwater that is being used for drinking water. This may pose a threat to people's health as some VOCs are believed to cause cancer in humans. More information can be found on the following website: www.atsdr.cdc.gov/substances/toxchemicallisting.asp?sysid=7.

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Appendix B
Community Resources

Information Repositories

EPA maintains information repositories where site information is available.

Local Information Repository:
Morgan County Public Library
110 S. Jefferson St.
Martinsville, IN 46151
765-342-3451
www.morgancountylibrary.info

Administrative Record:
EPA Superfund Records Center
Ralph Metcalfe Federal Building, Room 711
77 W. Jackson Blvd.
Chicago, IL 60604


Morgan County Public Library

EPA Website

EPA maintains a website for the Pike and Mulberry Streets PCE Plume site at www.epa.gov/superfund/pike-mulberry-pce.

Possible Meeting Locations

- Martinsville High School Auditorium
- Morgan County Public Library
- City Hall
- Churches
- Art Sanctuary
- Morgan County Administration Building
- South Central Indiana-REMC


Martinsville High School

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Appendix C
List of Contacts

Federal Agencies

United States Environmental Protection Agency

Kirstin Safakas
Community Involvement Coordinator
77 W. Jackson Blvd. (RE-6J)
Chicago, IL 60604
312-886-6015
800-621-8431, x66015
safakas.kirstin@epa.gov

Erik Hardin
Remedial Project Manager
77 W. Jackson Blvd. (SR-6J)
Chicago, IL 60604
312-886-2402
800-621-8431, x62402
hardin.erik@epa.gov

Federal Elected Officials

Dan Coats
Senator
1650 Market Tower
Indianapolis, IN 46204
800-382-9841

101 Martin Luther King Jr. Blvd.
Evansville, IN 47708
812-465-5600

493 Russell Office Bldg.
Washington, DC 20510
202-224-5623

Joe Donnelly
Senator
123 NW 4th St., Suite 417
Evansville, IN 47708
812-425-5862

115 N. Pennsylvania St., Suite 3200
Indianapolis, IN 46204
317-226-5555

720 Hart Senate Office Bldg.
Washington, DC 20510
202-224-4814

Todd Young
U.S. Representative
3210 W. 8th St., Suite 114
Bloomington, IN 47404
812-336-3000

1007 Longworth HOB
Washington, DC 20515
202-225-5315

State Elected Officials

Eric Holcomb
Governor
Indiana Statehouse
Indianapolis, IN 46204
317-232-4567

Rodric Bray
Senator-District 37
200 W. Washington St.
Indianapolis, IN 46204
317-382-9467
senator.bray@iga.in.gov

Peggy Mayfield
State Representative-District 60
200 W. Washington St.
Indianapolis, IN 46204
800-382-9841
courtney.scott@iga.in.gov

State & Local Agencies

Jessica Fliss
Senior Environmental Manager
Indiana Department of Environmental Management
100 N. Senate Ave. IGCN 1101
Indianapolis, IN 46204
317-233-2823
jfliss@idem.in.gov

Indiana Department of Natural Resources
402 W. Washington St.
Indianapolis, IN 46204
317-232-4200

Indiana State Department of Health
2 N. Meridian St.
Indianapolis, IN 46204
317-233-1325

Morgan County Health Department
180 S. Main St., Suite 252
Martinsville, IN 46151
765-342-6621

Local Officials

Shannon Kohl
Mayor
59 S. Jefferson St.
Martinsville, IN 46151
765-342-2861
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Council Member-Precinct 1
59 S. Jefferson St.
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765-346-0752
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59 S. Jefferson St.
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Kristopher Fuller
Council Member-At Large
59 S. Jefferson St.
Martinsville, IN 46151
765-341-9556
kfuller@martinsville.in.gov

Kevin Broyer
Superintendent
Water and Sewer Department
390 S. Mulberry St.
Martinsville, IN 46151
765-342-2707

Rebecca Tumey
City Clerk Treasurer
59 S. Jefferson St.
Martinsville, IN 46151
765-342-6012

Newspapers

Reporter-Times
60 S. Jefferson St.
Martinsville, IN 46151
765-342-3311
www.hoosiertimes.com/reporter_times/

Indy Star
130 S. Meridian St.
Indianapolis, IN 46225
317-444-4000
www.indystar.com

Television Stations

WXIN-FOX59
6910 Network Pl.
Indianapolis, IN 46278
317-632-5900

WRTV-Channel 6
1330 N. Meridian St.
Indianapolis, IN 46202
317-635-9788

WIPX TV-Channel 27
2441 Production Dr., #104
Indianapolis, IN 46241
317-486-0633

WISH-TV
1950 N. Meridian St.
Indianapolis, IN 46202
317-923-8888

Radio Stations

WCBK-FM-102.3
1739 Burton Lane
Martinsville, IN 46151
765-342-3394

WMYJ-1540 AM
P.O. Box 1970
Martinsville, IN 46151
765-342-3394

WOLT-FM-103.3
6161 Fall Creek Rd.
Indianapolis, IN 46220
317-257-7565

WIBC-93.1
40 Monument Circle, Suite 400
Indianapolis, IN 46204
317-266-9422

WYXB-105.7
40 Monument Circle, Suite 400
Indianapolis, IN 46204
317-681-1057

WNTR-109.7
9245 N. Meridian St. Suite 300
Indianapolis, IN 46260
317-816-4000

WYFI-90.1
1630 N. Meridian St.
Indianapolis, IN 46260
317-636-2020

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Appendix D

Community Engagement and the Superfund Process

Superfund is an environmental cleanup program enabled by a federal law enacted in 1980 known as the **Comprehensive Environmental Response, Compensation, and Liability Act,** or **CERCLA**, also called Superfund. In 1986, another law, the Superfund Amendments and Reauthorization Act, reauthorized CERCLA to continue Superfund cleanup activities. CERCLA gives EPA the authority to require those parties responsible for creating hazardous waste sites to clean up those sites or to reimburse the government if EPA cleans up the site. EPA compels responsible parties to clean up hazardous waste sites through Administrative Orders and other legal agreements. EPA is authorized to enforce the Superfund laws in all 50 states and within tribal reservations and U.S. territories. Superfund site identification, monitoring, and response activities are coordinated with state, tribal, and territorial environmental protection or waste management agencies.

There are several steps involved in cleaning up a contaminated location. Once EPA has been made aware of a contaminated area from individual citizens, local, tribal or state agencies or others, it follows a step-by-step process (*see Figure 1*) to determine the best way to clean up the area and protect people's health and the environment.

If a site poses an immediate threat to public health or the environment, EPA can intervene with an **emergency response action**. The goal of EPA's Emergency Response and Removal Program is to protect the public and the environment from immediate threats posed by the release or discharge of hazardous substances.

The Superfund program encourages active dialogue between communities affected by the release of hazardous substances and all of the agencies responsible for carrying out or overseeing cleanup actions. EPA considers community involvement to be an important part of the Superfund program and opportunities for community involvement occur throughout the process.

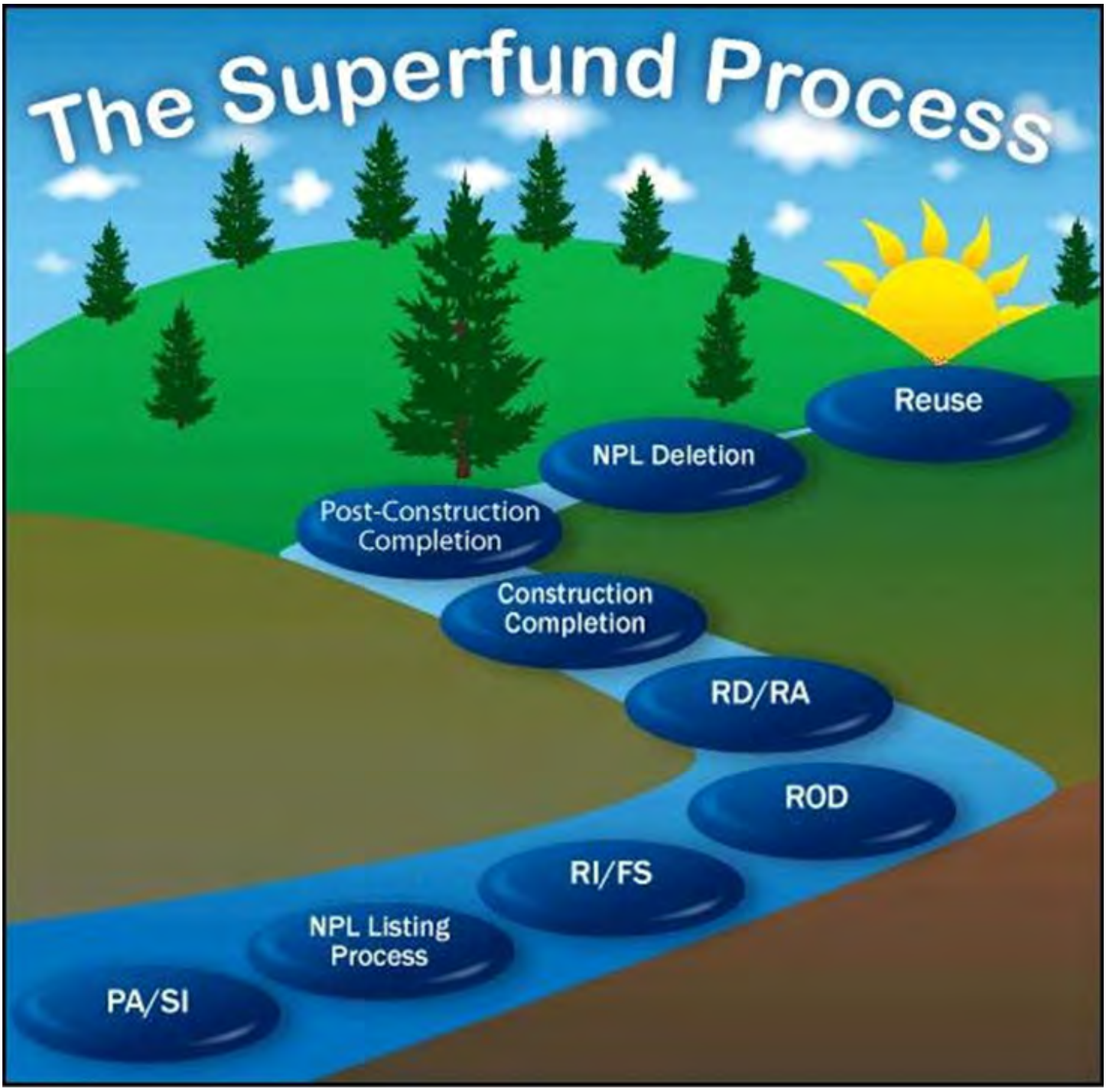
Visit these EPA websites for more information on the Superfund process:

Superfund: *www.epa.gov/superfund*

Cleanup: *www.epa.gov/superfund/cleaning-superfund-sites*

Community Involvement: *www.epa.gov/superfund/superfund-community-involvement*

Figure 1: Superfund Process Steps



Legend

PA/SI	Preliminary Assessment/Site Investigation
NPL Listing	National Priorities List
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RD/RA	Remedial Design/Remedial Action
NPL Deletion	National Priorities List Deletion

Figure 2: Community Involvement Opportunities During the Superfund Process

The Superfund Process

What will happen?		What can I do?
• EPA reviews existing information about the site • The site is inspected • Meetings are held with local officials and key community members to obtain historical information	**Preliminary Assessment/Site Investigation**	• Provide EPA with any information you have about the site • Request TASC* program if necessary
• A Hazard Ranking System is used to evaluate dangers the site may pose to human health and environment • Proposal published in the Federal Register, requesting public comments on whether site should be included in the NPL	**National Priorities List**	• Read EPA's proposal to add site to NPL • Submit any comments during public comment period • Apply for TAG* if your community qualifies
• Soil, surface water, ground water, and waste samples from site are analyzed • Cleanup methods are explored • Community Involvement Plan is developed • Information repository is established	**Remedial Investigation/ Feasibility Study**	• Participate in community interviews • Review site information at the information repository or on EPA website • Join or form a CAG*
• A cleanup plan is proposed, highlighting EPA's recommended cleanup method • A public meeting is held • 30-day public comment period issued	**Proposed Plan**	• Review and comment on the proposed plan • Attend public meeting discussing the proposed cleanup method
• The selected cleanup plan, including responses to public comments, are included in the ROD	**Record of Decision**	• Read the ROD at the information repository or on EPA website
• Cleanup methods are developed • A fact sheet is issued. EPA may hold meetings to describe the final design • Construction or implementation stage of cleanup begins	**Remedial Design/ Remedial Action**	• Read fact sheet about the work including planned work hours, truck traffic, noise and health and safety precautions • Attend meetings
• Routine maintenance takes place once construction is completed to protect human health and the environment • EPA reviews the site every 5 years	**Maintaining Site Cleanup over the Long-Term**	• Work through your TASC or CAG for information • Contact EPA with questions
• The site may be deleted from the NPL if all cleanup goals are met • Public comments are solicited on deletion of site from NPL	**NPL Site Deletion**	• Provide comments about the site • Read the final deletion report • Plan a community event to celebrate deletion from NPL

Reuse of site

After the site is cleaned up, EPA will work with your community to help return the site to productive use.

For more information on the Superfund Process, visit: www.epa.gov/superfund/superfund-cleanup-process.

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Appendix E
EPA Fact Sheets

EPA
United States
Environmental Protection
Agency

EPA to Test Homes for Vapors; Access Agreements Needed

Pike and Mulberry Streets PCE Plume Site
Martinsville, Indiana October 2015

U.S. Environmental Protection Agency workers will be in Martinsville November 3 and 4 to speak with residents about possible indoor air pollution at selected residential and commercial properties in your neighborhood. EPA wants to test houses and buildings for the threat of an environmental problem known as "vapor intrusion." The tests will detect the presence of potentially harmful gases that may be moving up through the soil and into properties through cracks or holes in basements and crawl spaces and then into living areas. The gas of concern is called tetrachloroethylene, or PCE.

How EPA selects properties to be tested

EPA will choose the houses and businesses to be sampled based on:

- Gas levels trapped in nearby outdoor soil, called "soil gas," and also the amount of PCE found in groundwater. "Groundwater" is an environmental term for underground supplies of fresh water.
- Proximity to the suspected source of pollution.

If your house or business is selected, EPA representatives will contact you. If the EPA does not contact you, your property is not among those that will be scheduled for testing at this time. If you are not contacted, you are still welcome to bring questions to EPA *(see contact information left-hand box)*. If necessary, EPA may contact you later for testing.

EPA needs permission of property owners to conduct the testing so you will be asked to sign a document called an "access agreement." This is voluntary, and there is no cost to property owners. If you do not sign the agreement, your property will not be tested.

Canister used to collect indoor air samples inside a house.

For more information

To learn more about the EPA's indoor air testing in Martinsville, contact:

For technical questions:
Mike Beslow
On-Scene Coordinator
312-353-8678
beslow.mike@epa.gov

Erik Hardin
Remedial Project Manager
312-886-2402
hardin.erik@epa.gov

For general questions:
Teresa Jones
Community Involvement Coordinator
312-886-0725
jones.teresa@epa.gov

EPA toll-free: 800-621-8431, 8:30 a.m. – 4:30 p.m., weekdays.

EPA Chicago Office:
U.S. EPA Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

Website:
http://www.epa.gov/superfund/pike-mulberry-pce

How are properties tested?

Technicians will take one or more air samples from a structure. A device may be placed in the basement of the house or building. However, if you only have a crawl space, the device may be placed in a living area of the house such as a family room or kitchen (*see photos on front page and below).*

If you have a basement, technicians may drill a small hole in the floor to install another device that will test the air under your house or building. They will repair the hole when the equipment is removed. Devices used to take air samples are simple canisters that can sit on a table but must remain in place for 24 hours.

Air samples will be analyzed in a laboratory. It will take up to two weeks to get results. EPA will then provide test results to residents and owners and will share the information with the federal Agency for Toxic Substances and Disease Registry, which analyzes health risks.

The site was named for the intersection of these two streets, which are at the center of the area where the PCE plume was thought to exist at the onset of the investigation.

Canisters like this will be placed in basements to collect sub-slab air samples.

What is PCE?

Tetrachloroethylene is a synthetic chemical that is widely used for dry-cleaning and degreasing metal. Exposure to very high levels of PCE can cause dizziness, skin irritation, headache, sleepiness, confusion, nausea, difficulty in speaking and even death. These symptoms usually occur in work environments when people have been exposed to high levels.

Does the gas go away?

If gases at harmful levels are discovered, the chemical PCE is removed from houses and buildings by drawing vapors from below the structure and venting them above the eaves. See the photo below of a typical mitigation system. The vapors are greatly diluted when released to the outside air and degraded by sunlight.

The unobtrusive vent system is very similar to the kind used to mitigate radon buildup in many Midwestern basements.

Come talk with us

On Wednesday, Nov. 4, EPA representatives will be available at the Morgan County Library from 3 – 6 p.m. to speak with residents about vapor intrusion testing in Martinsville.

The open house is intended as an opportunity for residents and property owners in the affected area to discuss this issue with EPA experts. Affected residents will be contacted individually by EPA, but anyone else with questions about this matter is welcome.

EPA officials expect to hold a public meeting early next year to discuss the findings from this investigation and provide an update on the overall site investigation.

For more information

You can see documents related to the Pike and Mulberry Streets PCE Plume site at: http://www.epa.gov/superfund/pike-mulberry-pce,

or

Morgan County Public Library
110 S. Jefferson St.
Martinsville

This photograph shows a vapor mitigation system installed on the outside of a house.

United States
Environmental Protection
Agency

Region 5
Superfund Division (SI-7J)
77 W. Jackson Blvd.
Chicago, IL 60604-3590

FIRST CLASS

RETURN SERVICE REQUESTED

PIKE AND MULBERRY STREETS PCE PLUME SITE: EPA To Test Homes for Vapors

This fact sheet is printed on paper made of recycled fibers.

EPA to Test Homes for Vapors

EPA representatives will be available to speak with residents about possible indoor air pollution.

Wednesday, Nov. 4
3 to 6 p.m.

Morgan County Library
110 S. Jefferson St.
Martinsville

For more information about the site, visit www.epa.gov/superfund/pike-mulberry-pce

EPA Seeks Input for Community Involvement Plan

Pike and Mulberry Streets PCE Plume Site
Martinsville, Indiana April 2019

U.S. Environmental Protection Agency has conducted numerous investigations and testing at the Pike and Mulberry Streets PCE Plume site to determine if potentially harmful contaminants may be in groundwater, soil, and/or indoor air. The main contaminant of concern is tetrachloroethene, or PCE. Besides polluting soil and underground water supplies (groundwater), PCE can also cause an environmental problem called vapor intrusion. Vapor intrusion can occur when underground pollutants release gases that travel up through the dirt and seep into buildings through cracks and holes to cause indoor air pollution.

Community involvement plan

EPA is currently developing a Community Involvement Plan, or CIP, for the site. The purpose of a CIP is to provide EPA with information about community concerns and enhance communication between residents and EPA. Residents often provide valuable insight that assist the Agency with its cleanup decisions. Residents also help the EPA understand how the community wants to receive information and the type of information they would like to receive. This helps the Agency provide meaningful engagement opportunities to the public throughout the cleanup process at Superfund sites.

Site background

The site is primarily a 38-acre groundwater plume contaminated with PCE. A plume is a mass of contaminated underground water that often moves. The plume is centered near the intersection of Pike and Mulberry streets in Martinsville (see map, below) and flows downstream affecting the municipal wellfield and drinking water treatment plant. This wellfield is used by the city of Martinsville for its public drinking water supply. The city has been treating drinking water using activated carbon filtration since 2005 to remove PCE from its water.

Map showing approximate site location.

For more information

If you have questions or concerns about the Pike and Mulberry Streets PCE Plume site, contact these EPA team members:

Kirstin Safakas
Community Involvement Coordinator
312-886-6015
safakas.kirstin@epa.gov

Erik Hardin
Remedial Project Manager
312-886-2402
hardin.erik@epa.gov

You may call EPA toll-free: 800-621-8431, 9:30 a.m. – 5:30 p.m., weekdays.

View documents related to the site at the information repository:

Morgan County Public Library
110 S. Jefferson
Martinsville

To learn more about the site, visit http://www.epa.gov/superfund/pike-mulberry-pce .

Site history

The former Master Wear facility operated as an industrial dry cleaner in downtown Martinsville from 1986 to 1991. Its operations included laundering and dry-cleaning using PCE for commercial and institutional organizations. Between 1987 and 1991, multiple complaints of illegal dumping and mishandling of waste drums at the facility were reported to the Indiana Department of Environmental Management. Several spills and releases were also reported. EPA believes this facility is the main source of PCE to the site. Other industries and businesses, including several dry-cleaning facilities that operated historically in Martinsville, have also been identified as possible sources of PCE and other contaminants.

Various investigations have been performed in the past and a vital cleanup project called a "time critical removal action," was conducted from 2003 to 2008 at the facility to address contamination in soil, groundwater, and soil vapor. A time critical removal action must be initiated within six months of a determination that pollution poses an imminent threat to public health or the environment.

The removal action included installing treatment systems that used pressurized air and vacuum systems to remove contaminated gasses in the source area. Individual buildings threatened by vapor intrusion were also treated by installing sub-slab depressurization systems. These systems started operating in 2005 and were turned off in 2008 since indoor air, soil, and groundwater sample results showed that closure criteria had been met.

In 2010, groundwater testing indicated the PCE concentrations had increased again. PCE in samples from the municipal wellfield (before carbon treatment) had also increased since the shutdown of the soil treatment systems. These high concentrations of PCE were used to place the site on the Superfund program's National Priorities List in May 2013.

A cleanup investigation was conducted from April 2015 through January 2017. Groundwater, soil, and soil vapor samples were collected and tested for volatile organic compounds, or VOCs (contaminants that evaporate into the air). A vapor intrusion investigation was also conducted where sub-slab soil vapor, crawlspace air, and indoor air samples were collected.

Human health risk assessments were completed as part of the cleanup investigation. PCE and trichloroethene, or TCE, were found in groundwater, soil vapor and/or indoor air at some residential or commercial properties.

A study of cleanup alternatives and goals for the site was recently completed. A report detailing the findings of this study is expected to be finalized in 2019.

The federal Agency for Toxic Substances and Disease Registry, or ATSDR, released its public health consultation report, an "Analysis of Contaminants in Drinking Water and Indoor Air," on March 4, 2019. The public health consultation was conducted to determine if exposures to PCE and TCE in the groundwater plume could be harming people's health. ATSDR's findings were as follows:

- People's health is not likely to be harmed by PCE and TCE contaminants from the Pike and Mulberry Streets PCE Plume in their public drinking water supply.
- People's health may be harmed if they breathed these contaminants that evaporated into the air inside of some homes and businesses through the vapor intrusion process.
- ATSDR could not fully assess the potential health effects from exposures to chemicals in the drinking water from private residential wells contaminated with PCE and TCE currently or in the past. This was because officials did not have adequate information about whether people were exposed and at what levels.

To read the report in full, visit: www.atsdr.cdc.gov/HAC/pha/PikeMulberryStreetsPCEPlume/Pike_Mulberry_Streets_HC-508.pdf.

Next steps

Once the study of cleanup options is final, EPA will issue a proposed cleanup plan for the site as part of its public participation responsibilities under the federal Superfund law. EPA will not select its final interim cleanup plan until after it reviews comments received from the public at a hearing and public comment period.

What is PCE?

Tetrachloroethylene is a synthetic chemical that is widely used for dry cleaning and for degreasing metal. Exposure to very high levels of PCE can cause dizziness, skin irritation, headache, sleepiness, confusion, nausea, difficulty in speaking and even death. These symptoms usually occur in work environments when people have been exposed to high levels.

For more information on PCE, visit https://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=264&tid=48.

Appendix F
ATSDR Fact Sheets

Tetrachloroethylene - ToxFAQs™

CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing and in the aerospace industry. Exposure to very high concentrations of tetrachloroethylene can cause dizziness headaches, sleepiness, incoordination confusion, nausea, unconsciousness, and even death. Tetrachloroethylene has been found in at least 949 of the 1,854 National Priorities List sites identified by U.S. Environmental Protection Agency (EPA).

What is tetrachloroethylene?

Tetrachloroethylene is a nonflammable colorless liquid. Other names for tetrachloroethylene include perchloroethylene, PCE, perc, tetrachloroethene, and perchlor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part in 1 million parts of air (1 ppm) or more.

Tetrachloroethylene is used as a dry cleaning agent and metal degreasing solvent. It is also used as a starting material (building block) for making other chemicals and is used in some consumer products.

What happens to tetrachloroethylene when it enters the environment?

- Tetrachloroethylene can be released into air, water, and soil at places where it is produced or used.
- Tetrachloroethylene breaks down very slowly in the air and so it can be transported long distances in the air. Half of the amount in the air will degrade in approximately 100 days.
- Tetrachloroethylene evaporates quickly from water into air. It is generally slow to break down in water.
- Tetrachloroethylene may evaporate quickly from shallow soils or may filter through the soil and into the groundwater below. It is generally slow to break down in soil.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it. You might also be exposed to tetrachloroethylene that is released into the air during showering and bathing.
- People residing near contaminated sites or dry cleaning locations may be exposed to higher levels than the general population.
- People working in the dry cleaning industries or using metal degreasing products may be exposed to elevated levels of tetrachloroethylene.

How can tetrachloroethylene affect my health?

Breathing high levels of tetrachloroethylene for a brief period may cause dizziness or drowsiness, headache, and incoordination; higher levels may cause unconsciousness and even death.

Exposure for longer periods to low levels of tetrachloroethylene may cause changes in mood, memory, attention, reaction time, and vision.

Studies in animals exposed to tetrachloroethylene have shown liver and kidney effects, and changes in brain chemistry, but we do not know what these findings mean for humans.

Tetrachloroethylene

CAS # 127-18-4

How likely is tetrachloroethylene to cause cancer?

Studies in humans suggest that exposure to tetrachloroethylene might lead to a higher risk of getting bladder cancer, multiple myeloma, or non-Hodgkin's lymphoma.

In animals, tetrachloroethylene has been shown to cause cancers of the liver, kidney, and blood system.

The Department of Health and Human Services (DHHS) considers tetrachloroethylene to be reasonably anticipated to be a human carcinogen. EPA considers tetrachloroethylene likely to be carcinogenic to humans by all routes of exposure. The International Agency for Research on Cancer (IARC) considers tetrachloroethylene probably carcinogenic to humans.

How can tetrachloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of tetrachloroethylene.

A few studies in humans have suggested that exposure to tetrachloroethylene increased the numbers of babies with birth defects, but these studies were not large enough to clearly answer the question. Studies in animals exposed by inhalation or stomach tube have not shown clear evidence of specific birth defects.

How can families reduce the risk of exposure to tetrachloroethylene?

- Tetrachloroethylene has been found in low levels in some food. You can minimize the risk of your family's exposure by peeling and thoroughly washing fruits and vegetables before cooking.
- Use bottled water if you have concerns about the presence of tetrachloroethylene in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has tetrachloroethylene.
- Tetrachloroethylene is widely used as a scouring solvent that removes oils from fabrics, as a carrier solvent, as a fabric finish or water repellant, and as a metal degreaser/cleaner. Follow instructions on product labels to minimize exposure to tetrachloroethylene.

Is there a medical test to determine whether I've been exposed to tetrachloroethylene?

Tetrachloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of tetrachloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because tetrachloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set an 8-hour time weighted average permissible exposure limit of 100 ppm, an acceptable ceiling exposure limit of 200 ppm, and a maximum peak of 300 ppm (not to be exceeded for more than 5 minutes of any 3-hour period).

The National Institute for Occupational Safety and Health (NIOSH) recommends that workplace exposure to tetrachloroethylene be minimized due to concerns about its carcinogenicity.

Reference

This ToxFAQs™ information is taken from the 2019 Toxicological Profile for Tetrachloroethylene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ on the web: www.atsdr.cdc.gov/ToxFAQs

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Trichloroethylene - ToxFAQs™

CAS # 79-01-6

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is used as a solvent for cleaning metal parts. Exposure to very high concentrations of trichloroethylene can cause dizziness headaches, sleepiness, incoordination, confusion, nausea, unconsciousness, and even death. Trichloroethylene has been found in at least 1,051 of the 1,854 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor.

The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-134a.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene can be released to air, water, and soil at places where it is produced or used.
- Trichloroethylene is broken down quickly in air.
- Trichloroethylene breaks down very slowly in soil and water and is removed mostly through evaporation to air.
- It is expected to remain in groundwater for long time since it is not able to evaporate.
- Trichloroethylene does not build up significantly in plants or animals.

How might I be exposed to trichloroethylene?

- Breathing trichloroethylene in contaminated air.
- Drinking contaminated water.
- Workers at facilities using this substance for metal degreasing are exposed to higher levels of trichloroethylene.
- If you live near such a facility or near a hazardous waste site containing trichloroethylene, you may also have higher exposure to this substance.

How can trichloroethylene affect my health?

Trichloroethylene was once used as an anesthetic for surgery. Exposure to moderate amounts of trichloroethylene may cause headaches, dizziness, and sleepiness; large amounts may cause coma and even death. Eating or breathing high levels of trichloroethylene may damage some of the nerves in the face. Exposure to high levels can also result in changes in the rhythm of the heartbeat, liver damage, and evidence of kidney damage. Skin contact with concentrated solutions of trichloroethylene can cause skin rashes. There is some evidence exposure to trichloroethylene in the work place may cause scleroderma (a systemic autoimmune disease) in some people. Some men occupationally-exposed to trichloroethylene and other chemicals showed decreases in sex drive, sperm quality, and reproductive hormone levels.

How likely is trichloroethylene to cause cancer?

There is strong evidence that trichloroethylene can cause kidney cancer in people and some evidence for trichloroethylene-induced liver cancer and malignant lymphoma. Lifetime exposure to trichloroethylene resulted in increased liver cancer in mice and increased kidney cancer and testicular cancer in rats.

The Department of Health and Human Services (DHHS) considers trichloroethylene to be a known human carcinogen. The International Agency for Research on Cancer (IARC) classified trichloroethylene as carcinogenic to humans. The EPA has characterized trichloroethylene as carcinogenic to humans by all routes of exposure.

Trichloroethylene

CAS # 79-01-6

How can trichloroethylene affect children?

It is not known whether children are more susceptible than adults to the effects of trichloroethylene.

Some human studies indicate that trichloroethylene may cause developmental effects such as spontaneous abortion, congenital heart defects, central nervous system defects, and small birth weight. However, these people were exposed to other chemicals as well.

In some animal studies, exposure to trichloroethylene during development caused decreases in body weight, increases in heart defects, changes to the developing nervous system, and effects on the immune system.

How can families reduce the risk of exposure to trichloroethylene?

- Avoid drinking water from sources that are known to be contaminated with trichloroethylene. Use bottled water if you have concerns about the presence of chemicals in your tap water. You may also contact local drinking water authorities and follow their advice.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has trichloroethylene.
- Trichloroethylene is used in many industrial products. Follow instructions on product labels to minimize exposure to trichloroethylene.

Is there a medical test to determine whether I've been exposed to trichloroethylene?

Trichloroethylene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of trichloroethylene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because trichloroethylene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure.

Has the federal government made recommendations to protect human health?

The EPA set a maximum contaminant goal (MCL) of 0.005 milligrams per liter (mg/L; 5 ppb) as a national primary drinking standard for trichloroethylene.

The Occupational Safety and Health Administration (OSHA) set a permissible exposure limit (PEL) of 100 ppm for trichloroethylene in air averaged over an 8-hour work day, an acceptable ceiling concentration of 200 ppm provided the 8 hour PEL is not exceeded, and an acceptable maximum peak of 300 ppm for a maximum duration of 5 minutes in any 2 hours.

The National Institute for Occupational Safety and Health (NIOSH) considers trichloroethylene to be a potential occupational carcinogen and established a recommended exposure limit (REL) of 2 ppm (as a 60-minute ceiling) during its use as an anesthetic agent and 25 ppm (as a 10-hour TWA) during all other exposures.

Reference

This ToxFAQs™ information is taken from the 2019 Toxicological Profile for Trichloroethylene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

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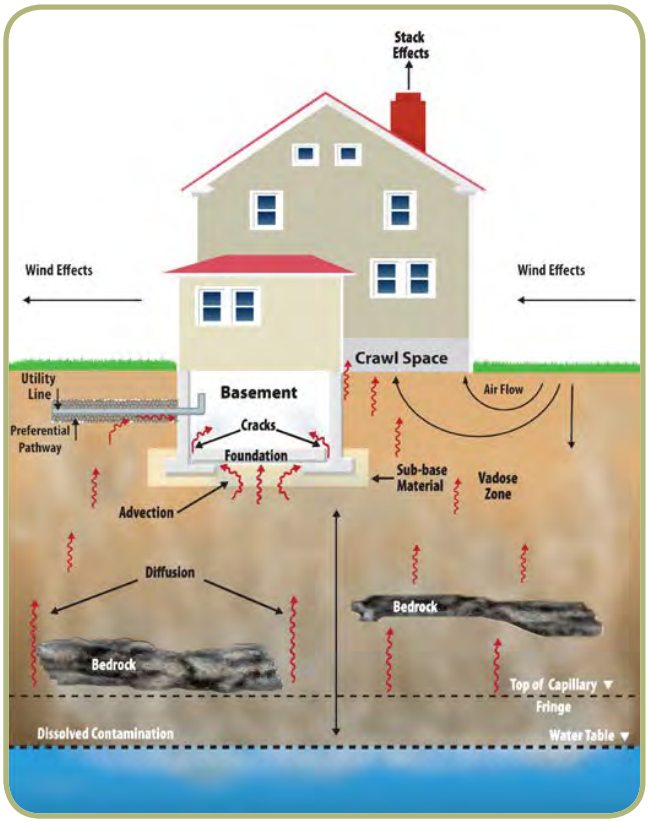
Overview of Vapor Intrusion

What is vapor intrusion?

Vapor intrusion is a way that volatile chemicals in soil and groundwater can enter and build-up inside buildings. Volatile chemicals are a class of chemicals that are volatile (evaporate easily) and form a vapor in the air.

- Common sources of volatile chemicals include gas stations, dry cleaners, and industrial operations.
- When a chemical is spilled or leaks into the ground, it can contaminate the soil and the groundwater.
- The chemical can move with the groundwater and travel under a building (migration route).
- If that chemical is volatile, it can become a gas and seep into nearby buildings and contaminate indoor air.

This fact sheet explains how vapor intrusion occurs and what factors can cause vapors (sometimes called gases) to move into indoor air.



Why is vapor intrusion important to me?

When chemicals move indoors, you can be exposed to them by breathing indoor air. This exposure can cause health effects, depending on the type and amount of chemical and the length of exposure.

You can learn more about the possible health effects of individual volatile chemicals in ATSDR's Toxic Substances Portal: http://www.atsdr.cdc.gov/substances/index.asp.

How does vapor intrusion occur?

Vapor intrusion does not occur every time there is contaminated soil or groundwater. It occurs only when volatile chemicals move from a source (like a chemical spill) along an underground migration route and into a building.

The type and amount of chemicals coming from a source will determine whether vapor intrusion occurs at levels of possible health concern.

What factors affect vapor intrusion?

The following factors affect vapor intrusion:

- The type of soil beneath your building
- The type and condition of your building (foundation, leaks, air exchange)
- The weather conditions in your area

The amount of vapors entering a building can be different over time—changing hourly, daily, weekly, and seasonally.

The amount of vapor intrusion can also be different on different floors and in different rooms of the same building or in buildings right next to each other.

If scientists suspect vapor intrusion in buildings in a specific location, they may decide to conduct an investigation. See ATSDR's fact sheet "Investigating Vapor Intrusion" for information on what to expect if a vapor intrusion investigation is planned for buildings in your area.

Where can I learn more about vapor intrusion?

U.S. Environmental Protection Agency

- Vapor intrusion website, visit: http://www2.epa.gov/vaporintrusion

Interstate Technology & Regulatory Council

- Vapor intrusion website, visit: http://www.itrcweb.org/Team/Public?teamID=22

Agency for Toxic Substances and Disease Registry

- Investigating vapor intrusion, visit: https://www.atsdr.cdc.gov/docs/atsdr_vapor_investigation.pdf