Valley Pike VOC Site

Riverside, Ohio

March 30, 2016

Ohio Department of HEALTH

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY EPA EMERGENCY RESPONSE

OhioEPA

City of Riverside
Pride • Progress • Possibilities

Public Health - Dayton & Montgomery County
PREVENT. PROMOTE. PROTECT.

ATSDR
Department of Health and Human Services
Agency for Toxic Substances & Disease Registry

Meeting Agenda

Introductions

U.S. EPA Short Presentation

- **Site Status Update**
- **Enforcement Update**
- **NPL Listing**

Department of Health Presentation

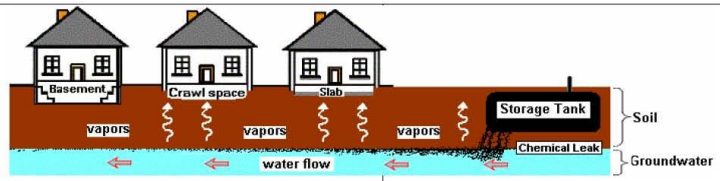
What is Vapor Intrusion?

Vapor Intrusion is the migration of chemicals from a spill through soil into indoor air

Not drinking contaminated groundwater…..but you may be breathing vapors from contaminated groundwater

Bureau of Environmental Health
Health Assessment Section
"To protect and improve the health of all Ohioans"

Vapor Intrusion
Answers to Frequently Asked Health Questions



What is vapor intrusion?
Vapor intrusion refers to the vapors produced by a chemical spill/leak that make their way into indoor air. When chemicals are spilled on the ground or leak from an underground storage tank, they will seep into the soils and will sometimes make their way into the groundwater (underground drinking water). There are a group of chemicals called volatile organic compounds (VOCs) that easily produce vapors. These vapors can travel through soils, especially if the soils are sandy and loose or have a lot of cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

VOCs and vapors:
VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are also used in dry cleaning. If there is a large spill or leak resulting in soil or groundwater contamination, vapor intrusion may be possible and should be considered a potential public health concern that may require further investigation.

Although large spills or leaks are a public health concern, other sources of VOCs are found in everyday household products and are a more common source of poor indoor air quality. Common products such as paint, paint strippers and thinners, hobby supplies (glues), solvents, stored fuels (gasoline or home heating fuel), aerosol sprays, new carpeting or furniture, cigarette smoke, moth balls, air fresheners and dry-cleaned clothing all contain VOCs.

Can you get sick from vapor intrusion?
You can get sick from breathing harmful chemical vapors. But getting sick will depend on:
How much you were exposed to (dose).
How long you were exposed (duration).
How often you were exposed (frequency).
How toxic the spill/leak chemicals are.
General Health, age, lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

VOC vapors at high levels can cause a strong petroleum or solvent odor and some persons may experience eye and respiratory irritation, headache and/or nausea (upset stomach). These symptoms are usually temporary and go away when the person is moved to fresh air.

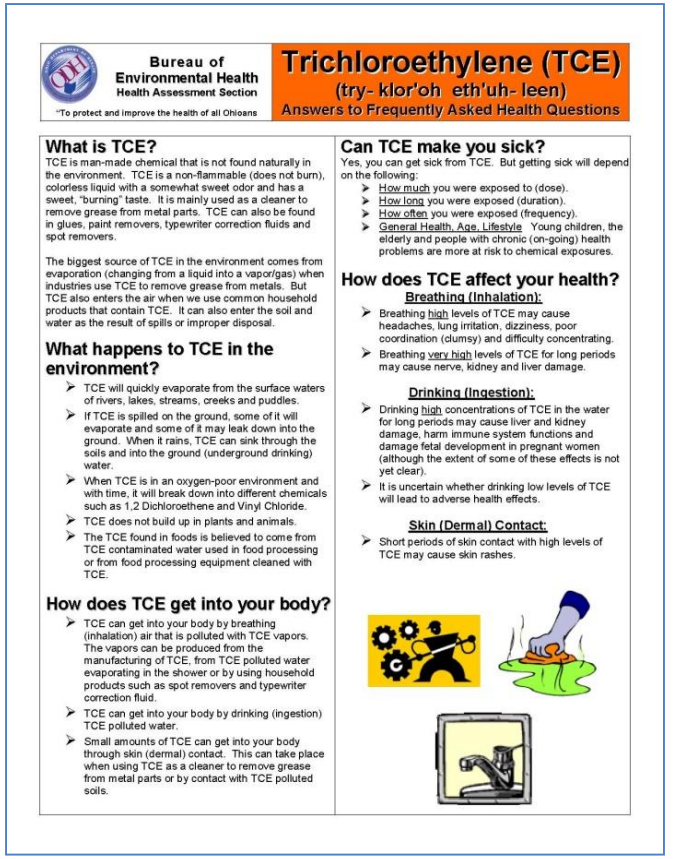
Lower levels of vapors may go unnoticed and a person may feel no health effects. A few individual VOCs are known carcinogens (cause cancer). Health officials are concerned with low-level chemical exposures that happen over many years and may raise a person's lifetime risk for developing cancer.

How is vapor intrusion investigated?
In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, environmental protection and public health officials may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potential affected business or home. The Ohio Department of Health (ODH) does not usually recommend indoor air sampling for vapor intrusion before the on-site contamination is determined.

(continued on next page)

What is Perchloroethylene (PCE) & Trichloroethylene (TCE)

- Man-made chemical, colorless liquid
- Used as a cleaner and degreaser
- Evaporates easily into the air (volatile organic compound changes from a liquid to a vapor)
- Sub-Slab & Indoor air screening levels for PCE & TCE have been established by the Ohio Department of Health (ODH) & ATSDR



Bureau of Environmental Health
Health Assessment Section
"To protect and improve the health of all Ohioans"

Trichloroethylene (TCE)
(try- klor'oh eth'uh- leen)
Answers to Frequently Asked Health Questions

What is TCE?
TCE is man-made chemical that is not found naturally in the environment. TCE is a non-flammable (does not burn), colorless liquid with a somewhat sweet odor and has a sweet, "burning" taste. It is mainly used as a cleaner to remove grease from metal parts. TCE can also be found in glues, paint removers, typewriter correction fluids and spot removers.

The biggest source of TCE in the environment comes from evaporation (changing from a liquid into a vapor/gas) when industries use TCE to remove grease from metals. But TCE also enters the air when we use common household products that contain TCE. It can also enter the soil and water as the result of spills or improper disposal.

What happens to TCE in the environment?
- TCE will quickly evaporate from the surface waters of rivers, lakes, streams, creeks and puddles.
- If TCE is spilled on the ground, some of it will evaporate and some of it may leak down into the ground. When it rains, TCE can sink through the soils and into the ground (underground drinking) water.
- When TCE is in an oxygen-poor environment and with time, it will break down into different chemicals such as 1,2 Dichloroethene and Vinyl Chloride.
- TCE does not build up in plants and animals.
- The TCE found in foods is believed to come from TCE contaminated water used in food processing or from food processing equipment cleaned with TCE.

How does TCE get into your body?
- TCE can get into your body by breathing (inhalation) air that is polluted with TCE vapors. The vapors can be produced from the manufacturing of TCE, from TCE polluted water evaporating in the shower or by using household products such as spot removers and typewriter correction fluid.
- TCE can get into your body by drinking (ingestion) TCE polluted water.
- Small amounts of TCE can get into your body through skin (dermal) contact. This can take place when using TCE as a cleaner to remove grease from metal parts or by contact with TCE polluted soils.

Can TCE make you sick?
Yes, you can get sick from TCE. But getting sick will depend on the following:
- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

How does TCE affect your health?

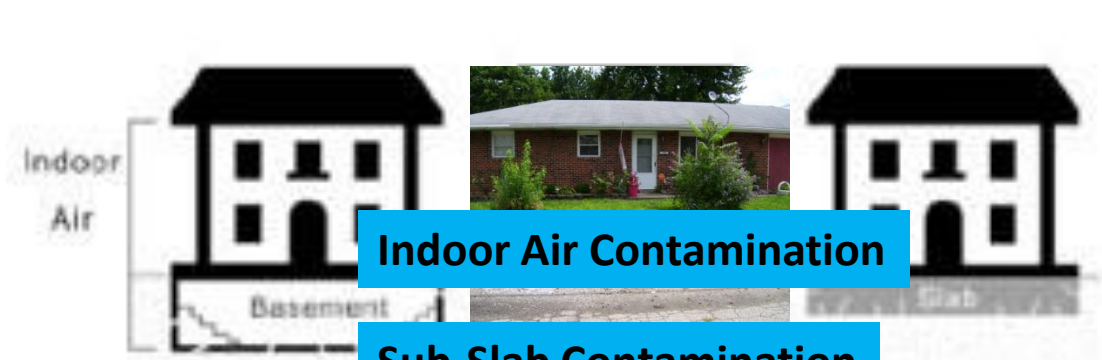
Breathing (Inhalation):
- Breathing high levels of TCE may cause headaches, lung irritation, dizziness, poor coordination (clumsy) and difficulty concentrating.
- Breathing very high levels of TCE for long periods may cause nerve, kidney and liver damage.

Drinking (Ingestion):
- Drinking high concentrations of TCE in the water for long periods may cause liver and kidney damage, harm immune system functions and damage fetal development in pregnant women (although the extent of some of these effects is not yet clear).
- It is uncertain whether drinking low levels of TCE will lead to adverse health effects.

Skin (Dermal) Contact:
- Short periods of skin contact with high levels of TCE may cause skin rashes.

What is Vapor Intrusion?

Conceptual Site Model



Indoor Air Contamination

Sub-Slab Contamination

Soil Gas Contamination

Chemical Facility
PCE & TCE Source?

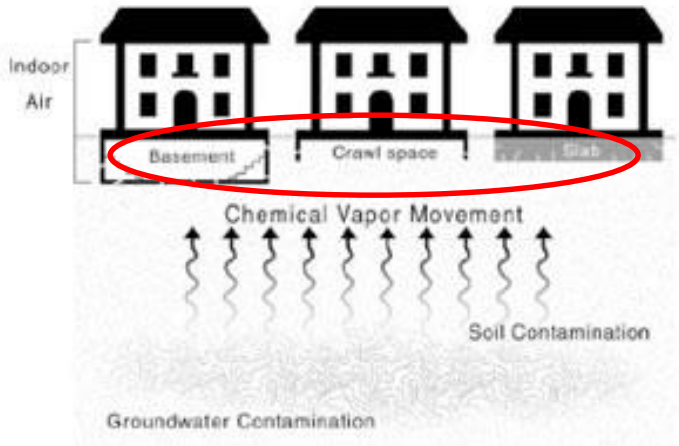
Groundwater Contamination

Multiple Lines of Evidence (GW, SG, SS, IA)

July 2013 US EPA Investigation
Sub-Slab Sampling

July-August 2013 initial Sub-Slab sampling conducted by US EPA.

Measures vapors below residence basement/slab.



Sub-Slab sample collected for 24 hours

Access Form

- **Request owner (and tenant) to sign access form prior to sampling**
- **Follow up meeting to be scheduled to discuss sample results**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

Name: _____

Address of Property: _____
To be Sampled

_____

Home Phone # _____

Cell Phone # _____

I consent to officers, employees, contractors, and authorized representatives of the United States Environmental Protection Agency (U.S. EPA) entering and having continued access to this property for the following purpose:

- Conducting monitoring and sampling activities;

I realize that these actions taken by U.S. EPA are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. Section 9601 et seq.

This written permission is given by me voluntarily, on behalf of myself and all other co-owners of this property, with knowledge of my right to refuse and without threats or promises of any kind.

_____ _____
Date **Signature**

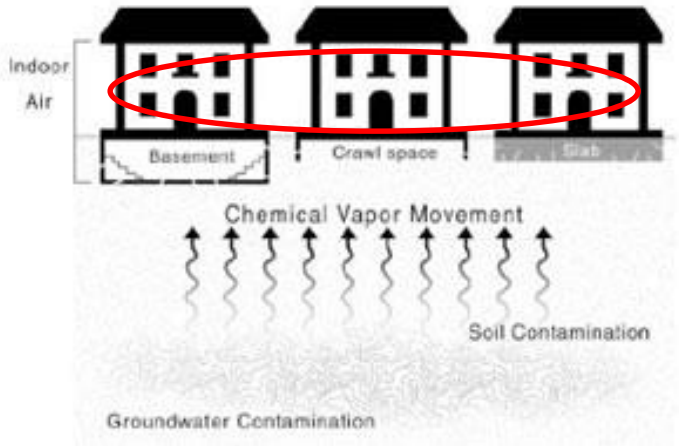
Residential Home or Commercial Building Questions:

1. Are you the Owner _____ or the Tenant _____ of the home or building?
2. If you are the owner but live at a different address, write your address below:
   Owner's Address: _____
   _____
   Home Phone # _____
   Cell Phone # _____
3. Does the home or building have a basement? Yes _____ No _____
4. If yes, does the basement have a concrete slab? Yes _____ No _____
5. If no, does the basement have a dirt floor? Yes _____ No _____
6. Is there a heating or ventilation system in the basement? Yes _____ No _____

July 2013 US EPA Investigation Indoor Air Sampling

July-August 2013 initial residential Indoor Air sampling conducted by US EPA.

Measures vapors in residence indoor air



Indoor Air sample collected for 24 hours

EPA Time Critical Removal Action

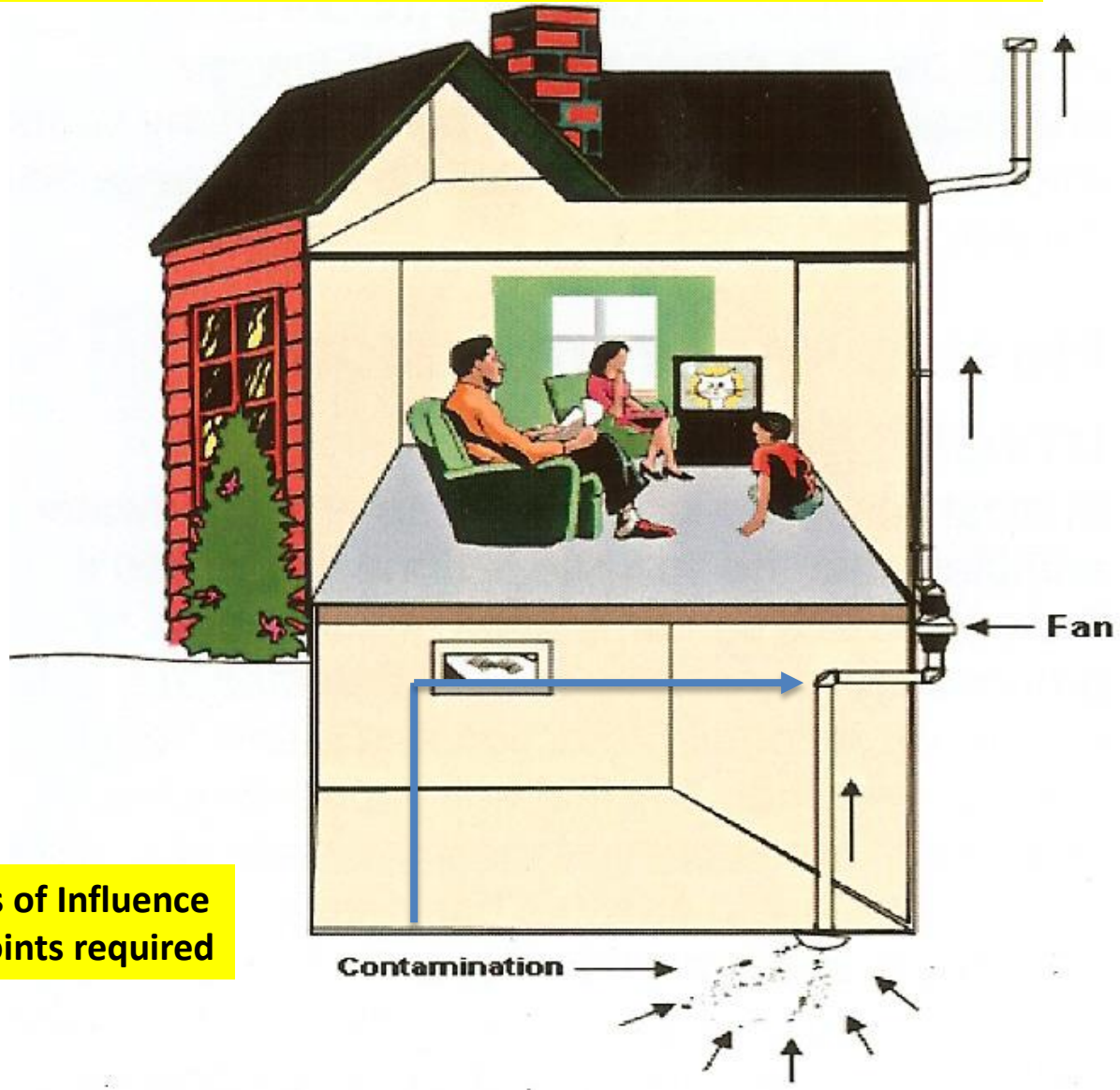
Scope of Work (initiated Dec 2013)

- **Protect Public Health**
- Conduct **residential Sub-Slab & Indoor Air sampling**;
- **If the ODH Screening Level for PCE or TCE is exceeded** for a residential structure, **design and install a vapor abatement system (aka VAS).**

Vapor Abatement System (VAS)

Vapor Abatement System

(VAS)



Overlapping Radius of Influence
1 to 2 extraction points required

Vapor Abatement System Installation

Extraction Pipe into Basement Floor

1 to 2 extraction points will be installed

Vapor Abatement System Installation

Crawl Space

Crawl space installation.
PVC pipe installed under plastic liner

Vapor Abatement System Installation

Vacuum Reading – U Tube Manometer

Manometer reads 1-2” vacuum

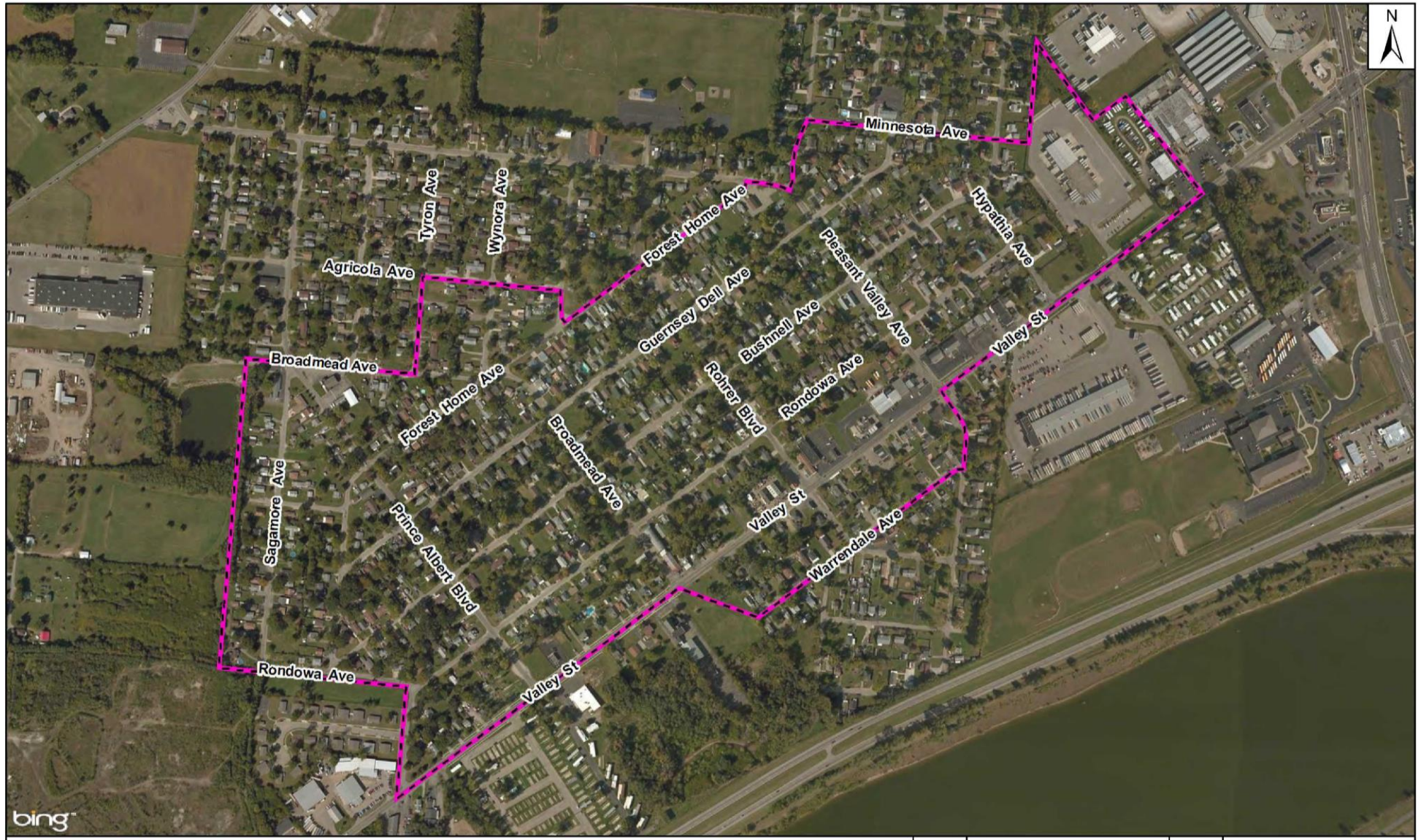
Vapor Abatement System Installation

Outside Fan and Vent

System Installation = 1-2 days

Follow-up proficiency air sampling @ 30 days

March 2016 Sampling Area – VI Sampling



Legend

VALLEY PIKE VOC SITE

MARCH 2016

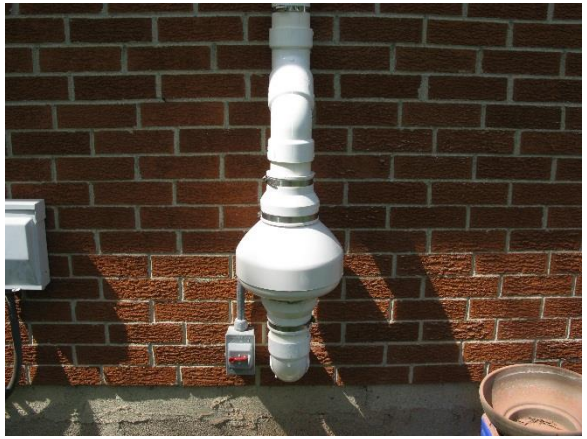
Properties Sampled to Date

Sub-Slab Sample

Crawl Space Sample

EPA has sampled a total of <u>417</u> residential properties.
573 properties in Area of Concern.
Approx 40 denied access or vacant

Vapor Abatement System (VAS) Installations



EPA has installed VAS at <u>89 of 92</u> residential properties eligible to receive a vapor abatement system.

2 residences = vacant

1 residence = deferred VAS until 2016

EPA Fact Sheets

Fact Sheets in July & Nov 2014 & March 2016

EPA
United States Environmental Protection Agency

EPA Expands Boundaries Based on Sampling Results

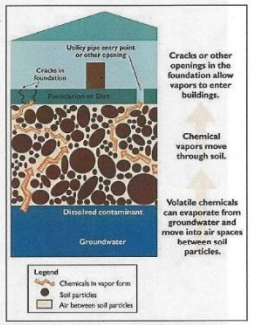
Valley Pike VOC Site
Riverside, Ohio — July 2014

The U.S. Environmental Protection Agency has expanded the boundaries for the Valley Pike VOC site (*see Page 2*). Based on Phase 1 sampling results, U.S. EPA included the Forest Home Avenue, Prince Albert Boulevard, Broadmead Avenue and Warrendale Avenue areas. Also, the boundaries were expanded from the 2500 blocks to the 2400 and 2300 blocks of Forest Home Avenue, Guernsey Dell Avenue and Bushnell Avenue. The area of concern now includes 365 residences. U.S. EPA did additional groundwater sampling the week of March 24 to determine the extent of aquifer contamination in the neighborhood. The expanded area of concern was based largely on tests of the groundwater and the Phase 1 air monitoring results.

Since July 2013, U.S. EPA has sampled more than 184 residences and installed 36 vapor abatement systems – similar to systems that control radon. The system includes a sub-slab or crawl space depressurization system, and sealing of cracks in walls and basement floors. After installation, U.S. EPA does proficiency air sampling to ensure the system is working properly.

Vapor intrusion

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. Measuring the amount of chemical vapors under the sub-slab or within the crawl space can show whether or not there is a vapor intrusion problem.



Samples are taken from the sub-slab and crawl space. In sub-slab testing, technicians install probes in the slab and attach them to a test canister to sample volatile organic compound, or VOC, vapors trapped under the house. Sampling in crawl spaces is done by placing a test canister inside the crawl space.

Access still needed

Do you want to know if vapor intrusion is a problem in your home? If so, you must sign an access agreement allowing U.S. EPA to test for vapors. If the home is a rental property, both owner and tenant must sign the agreement. The form also allows you to formally deny permission for the testing. If you have not completed an access agreement and live within the site boundaries, contact U.S. EPA (*see box, left*) or come by the local project office as soon as possible. If tests show your home needs a vapor abatement system, U.S. EPA will install it at no cost to you.

For more information

For questions, comments or more information about the Valley Pike VOC site cleanup, contact:

For technical questions:
Steve Renninger
On-Scene Coordinator
Emergency Response Branch
26 W. Martin Luther King Drive
Cincinnati, OH 45268
937-237-7530
renninger.steven@epa.gov

Riverside Local Project Office
2049 Harshman Road
937-237-7530

For general questions:
Ginny Narsete
Community Involvement Coordinator
U.S. EPA Superfund Division
77 W. Jackson Blvd.
Chicago, IL 60604
312-886-4359
narsete.virginia@epa.gov

U.S. EPA Chicago office toll-free:
800-621-8431, weekdays,
9:30 a.m. – 5:30 p.m.

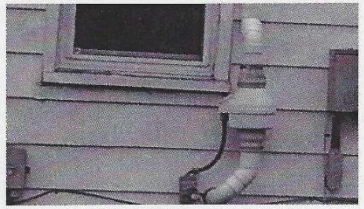
Or visit:
www.epa.gov/region5/cleanup/valleypikevocsite.

EPA
United States Environmental Protection Agency

EPA Answers Your Questions; Expands Sampling Area and Extends Deadline to Get Tested

Valley Pike VOC Site
Riverside, Ohio — November 2014

The U.S. Environmental Protection Agency has been busy sampling residences near the Valley Pike Superfund site and installing vapor abatement systems on structures that need them. The VAS is very similar to a radon removal system common to many Midwestern houses. The process includes installing a sub-slab or crawl space depressurization system, sealing cracks in walls and basement floors and includes air sampling to verify the VAS is working properly. Since December 2013, EPA sampled over 271 residences and installed 70 VAS.



This photograph shows a VAS installed on the outside of this house.

Sampling area expanded, project dates extended

Based on recent residential sampling data, EPA has again expanded the area of concern (*see map on P.4*) in the Valley Pike site farther west to Sagamore Avenue.

EPA also extended the project dates. You now have until **March 30, 2015,** to turn in a signed access agreement to have your property sampled.

Access still needed

EPA needs signed permission from property owners and tenants (residential only) to do the vapor sampling in order to determine if vapor intrusion is occurring in residences. If the structure is a rental property, both the owner and the tenant must sign the access agreement. Completion of the access form is required for either consent (which allows EPA to test) or denial. If you have not completed an access agreement and live within the Site boundaries, please contact EPA at one of the phone numbers in the box to the left or stop in the EPA Local Project Office as soon as possible. Installation of the VAS if needed is a free service.

Answers to frequently asked questions

As EPA continues work on the Valley Pike VOC site, many of the same questions have been asked by residents and other community members.

For more information

For questions, comments or more information about the Valley Pike VOC site removal action you can contact these EPA team members.

For technical questions:
Steve Renninger
On-Scene Coordinator
Emergency Response Branch
26 W. Martin Luther King Drive
Cincinnati, OH 45268
937-237-7530
renninger.steven@epa.gov

EPA Local Project Office
2049 Harshman Road
Riverside, OH 45424
937-237-7530

EPA staff is available at the Project Office to answer questions.

For general questions:
Ginny Narsete
Community Involvement Coordinator
EPA Region 5 Chicago Office
Superfund Division
77 W. Jackson Blvd.
Chicago, IL 60604
312-886-4359
narsete.virginia@epa.gov

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

For more information, please visit the following website:
www.epa.gov/region5/cleanup/valleypikevocsite

EPA
United States Environmental Protection Agency

Public meeting

You are invited to attend a public meeting about the Valley Pike VOCs site.

Stebbins High School
1900 Harshman Road
Dayton
Wednesday, March 30
6:30 – 8:30 p.m.

New U.S. EPA team members

Sonia Vega
On-scene Coordinator
630-481-5025
vega.sonia@epa.gov

Heriberto León
Community Involvement Coordinator
312-886-4359
leon.heriberto@epa.gov

EPA Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

U.S. EPA Region 5 toll-free:
800-621-8431,
9:30 a.m. – 5:30 p.m., weekdays

Mullins' contact

Amy Alduino is the Mullins community relations representative for the site. You can reach her at 937-303-3669, cicvalleypike@trcsolutions.com, or by appointment at 2049 Harshman Road.

EPA Signs Legal Agreement

Valley Pike VOCs Site
Riverside, Ohio — March 2016

U.S. Environmental Protection Agency has reached an agreement with Mullins Rubber Products and Mullins Land Co. to conduct removal actions and pay for certain response costs for the Valley Pike VOCs Superfund site. This agreement, called an Administrative Order on Consent, outlines work the companies must perform:

- Maintain a project office within one-half mile of the site.
- Conduct vapor intrusion sampling at residential, commercial and church properties.
- Design and install a vapor abatement system, or VAS, if site-related contaminant levels exceed sub-slab or indoor air screening levels.
- Develop and implement a plan to confirm that screening levels are achieved for indoor air contaminants of concern.
- Develop and implement a plan to conduct annual resampling of residential and commercial structures that had initial sample results below screening levels.
- Provide $75 annually for electric expenses (beginning January 2016) to property owners where a VAS was installed by U.S. EPA or the companies.
- Design, install and operate a soil vapor extraction system at the Mullins facility to remove source PCE and TCE contamination.

Sampling continues

U.S. EPA has continued to take samples at homes where residents have signed access agreements. So far, EPA has taken samples from more than 470 properties and installed almost 90 vapor abatement systems. The VAS is very similar to a radon removal system common to many Midwestern houses. The process includes installing a sub-slab or crawl space depressurization system, and sealing cracks in walls and basement floors. It includes air sampling to verify the VAS is working properly.

U.S. EPA's role will change

As part of the agreement, the companies will now be responsible for obtaining additional access agreements and sampling these properties. U.S. EPA will oversee their work.

U.S. EPA is scheduling sampling for the homes with signed access agreements and preparing close-out files for all homes where sampling has been completed and where VAS systems have been installed and checked for proper functioning.

EPA Region 5 Web Site

www.epa.gov/oh/valley-pike-vocs

ENFORCEMENT UPDATE

- On January 8, 2016, Mullins Rubber Products, Inc., and Mullins Land Company, entered into a settlement agreement with U.S. EPA known as an Administrative Settlement Agreement and Order on Consent, AOC.
- This settlement agreement provides for the performance of removal actions by the Respondents (Mullins), and the payment of certain response costs incurred by the United States at or in connection with the Valley Pike VOC Site, located in Riverside, Ohio.

ENFORCEMENT…

- Under the AOC the Respondents shall:
  - Maintain a project office. (They kept EPA's former location at 2049 Harshman RD).
  - Conduct sampling utilizing sub-slab, crawl space and indoor air sampling techniques. Shall include residential, commercial and church structures.
  - Current area of investigation includes MRP facility on the east, Sagamore Avenue on the west, Forest Home Avenue on the north, and Warrendale Avenue on the south.

ENFORCEMENT…

- Design and install a vapor abatement mitigation system at residential properties that exceed sub-slab or indoor air screening levels.
- Conduct performance sampling after VAS installation at least 30 days after installation, and annually thereafter.
- Conduct annual sampling at residential and commercial properties with baseline results UNDER the screening level.
- Starting January 2016, and every January thereafter, provide a $75 electric stipend to property owners where a VAS was installed by either EPA or the Respondents.
- Design, install and operate an SVE system at the MRP facility to remove the source of PCE and TCE.

REMOVAL vs REMEDIAL ACTIONS

- EPA's removal program addresses the short-term, time-critical needs, intended to protect immediate human health and the environment, like the sampling and installation of the VAS at your home.
- Now, the AOC respondent, Mullins Rubber Products & Mullins Land, will continue to conduct time critical removal actions under EPA's oversight.
- EPA and OEPA are evaluating transitioning site to the remedial program.
- EPA's remedial program looks into long term actions, i.e., groundwater remediation, source reduction, etc.

Valley Pike VOCs Site
Site Assessment Activities

- EPA is working with OEPA to evaluate whether the site is eligible for proposal to the National Priorities List (NPL), or Superfund.
- Superfund is the federal program that investigates some of the most serious or complex hazardous waste sites in the country.
- To evaluate the dangers posed by hazardous waste sites, EPA developed a scoring system called the Hazard Ranking System (HRS).
- The State of Ohio has concurred with proposal of the Valley Pike VOCs site to the NPL.

How do Sites get on the NPL/Superfund?

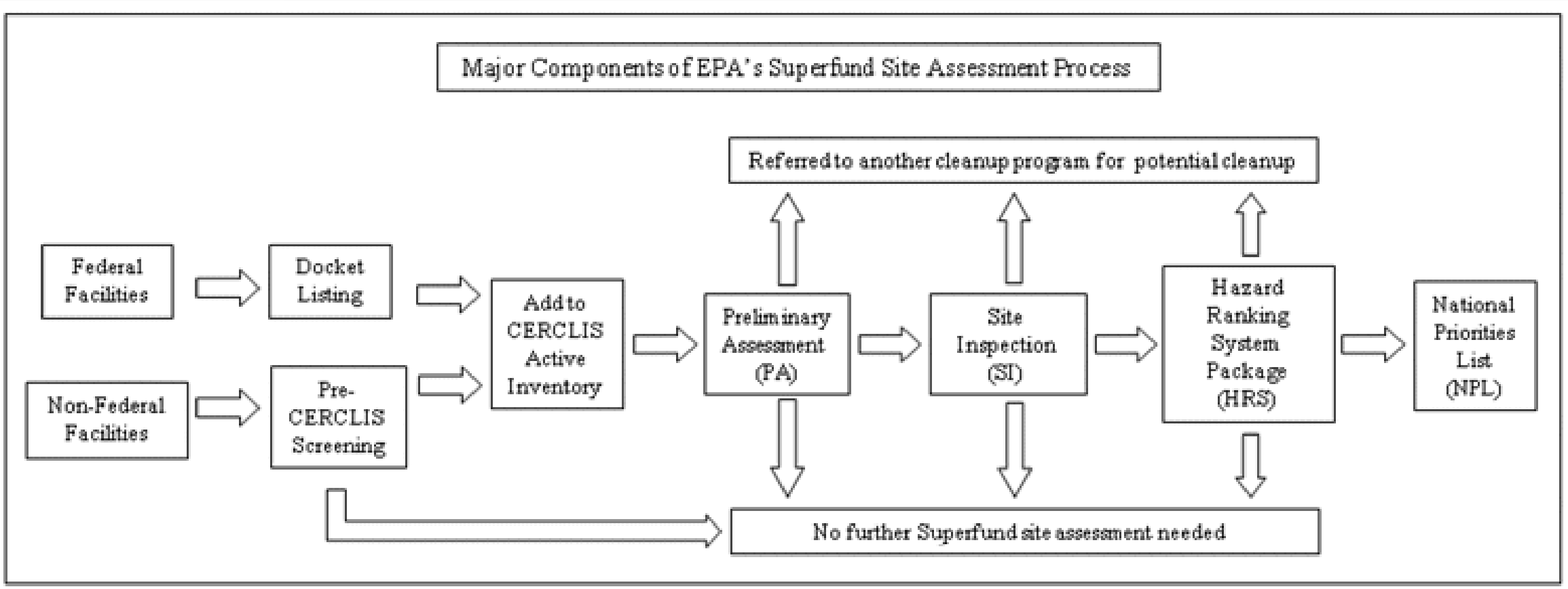
- EPA uses the information collected during the assessment phase of the Superfund process to score sites according to the relative danger they may pose to human health and the environment.

- EPA evaluates and rank hazardous waste releases to determine if a site is eligible for proposal to the NPL, or Superfund, using the Hazard Ranking System (HRS) process.

How do Sites get on the NPL/Superfund?

- Following a series of screening assessments, if a site has a high enough score on the HRS and meets all other criteria, EPA may propose that it be put on the NPL.
- The proposal is published in the Federal Register, the official publication of the U.S. government, and the public has an opportunity to comment.
- EPA responds to comments and if applicable, announces the decision in the Federal Register.
- Sites which are placed on the NPL are eligible for Superfund resources for comprehensive (usually long-term) remedial investigations and actions, if needed.

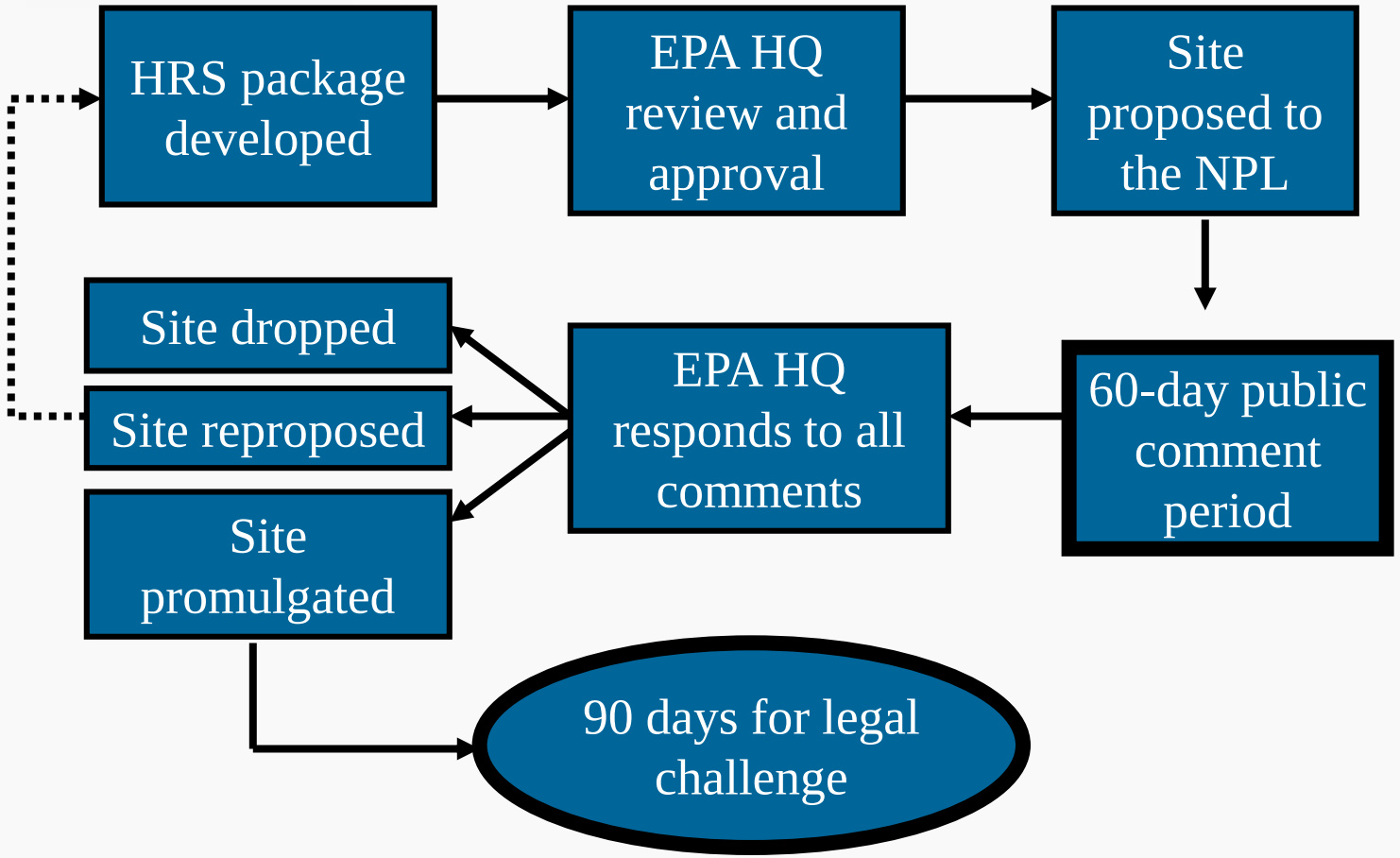
Superfund site assessment process



NPL Status of Valley Pike VOCs site

- EPA will complete evaluation of the Valley Pike VOCs site to determine if it is eligible for proposal to the NPL.
- If the site is proposed to the NPL, the site website would be updated with information regarding the proposal docket and comment process.
- If the site is proposed to the NPL, there would be a public comment period, after which EPA would evaluate comments, prepare responses and determine whether the site could be finalized to the NPL.
- Sites which are finalized on the NPL start the Superfund Remedial process.

NPL Listing Process



CANCER BURDEN AMONG RESIDENTS OF CENSUS TRACT 903.02

Valley Pike Volatile Organic Compounds (VOC) Site

1996 - 2012

Dawn L. Ebron, MS, MPH, CPH
Epidemiologist
Public Health – Dayton & Montgomery County

Public Health
Prevent. Promote. Protect.
Dayton & Montgomery County

February 2016

CHARACTERISTICS OF CANCER

- A disease in which abnormal cells divide uncontrollably and destroy healthy body tissue.
- Not uncommon; estimated 40% of men and women in the U.S. will be diagnosed with cancer at some point in their life.
- Cancer is a collection of related diseases; more than 100 different types.
- Categories of cancers
  1. Carcinoma
  2. Sarcoma
  3. Leukemia
  4. Lymphoma
  5. Multiple Myeloma
  6. Melanoma
  7. Brain and Spinal Cord Tumors

CANCER RISK FACTORS

- Genetics
- Tobacco
- Obesity/Overweight
- Poor Nutrition
- Lack of Physical Activity
- Alcohol Use
- Ultraviolet (UV) Radiation
- Certain Medical treatments (radiation, chemotherapy, hormone and immunosuppressant drugs)
- Some chemicals (benzene, formaldehyde)
- Infectious Agents (HPV, HIV, Epstein-Barr virus)

CANCER CLUSTER

Rare occurrences where there appears to be a greater burden of cancer in a community than normal is referred to as a cancer cluster.

A true cancer cluster meets the following criteria:

1. The number of observed cases is greater than what would be observed in a similar setting.
2. All the cancer cases must be the same type of cancer or types of cancer proven to have the same cause.
3. The population affected must be defined by factors such as race, age, and gender so that rates can be calculated.
4. The area in which the cancer cases are occurring has to be defined by geographic boundaries.
5. The number of cases included in the cluster and the calculation of the expected number of cases depends on how the time period is defined.

Source: Centers for Disease Control and Prevention

Valley Pike Cancer Assessment 1996-2012

Completed by Public Health – Dayton & Montgomery County

Public Health
Prevent. Promote. Protect.
Dayton & Montgomery County

WHY WAS THIS ASSESSMENT DONE?

- Site inspection of Mullins Rubber Products (MRP) in November of 2010 found tetrachloroethylene (PCE) and trichloroethylene (TCE) in the groundwater.
- TCE and PCE were also found in groundwater underlying the residential area boarding MRP to the west and southwest.
- Sub-slab and indoor air samples indicated PCE and TCE were entering homes in the area.
- EPA began installing vapor intrusion mitigation systems in homes.

PHDMC conducted this cancer assessment to determine if there was any health impact to residents as a direct result of this contamination.

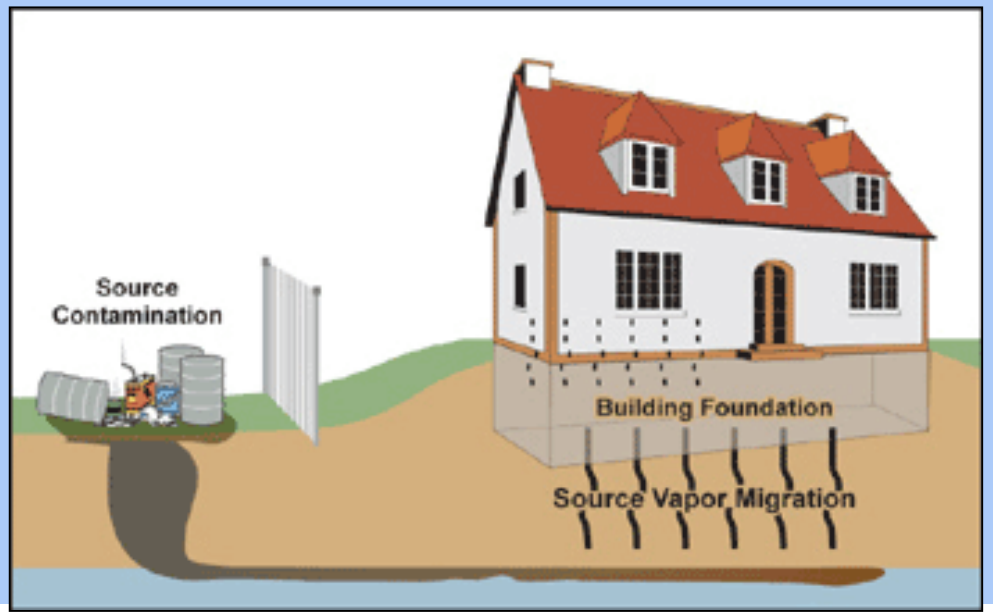
CONTAMINANTS

Tetrachloroethylene (PCE)

- "*likely to be carcinogenic to humans by all routes of exposure*" (EPA) and "*probably carcinogenic to humans*" (IARC)
- Long-term exposure can lead to higher risk of bladder cancer, multiple myeloma, or non-Hodgkin lymphoma.
- Strong evidence in animals, but limited evidence in humans

Trichloroethylene (TCE)

- "*carcinogenic to humans*" (EPA & IARC)
- Long-term exposure can cause kidney cancer (strong evidence) and liver cancer and non-Hodgkin lymphoma (some evidence).



WHAT AREA WAS INCLUDED IN THE ASSESSMENT?

Census Tract (CT) 903.02

- Contains the residential area directly impacted by suspected contamination from Mullins Rubber Products (MRP)
- Vapor intrusion investigation includes 545 properties south of MRP

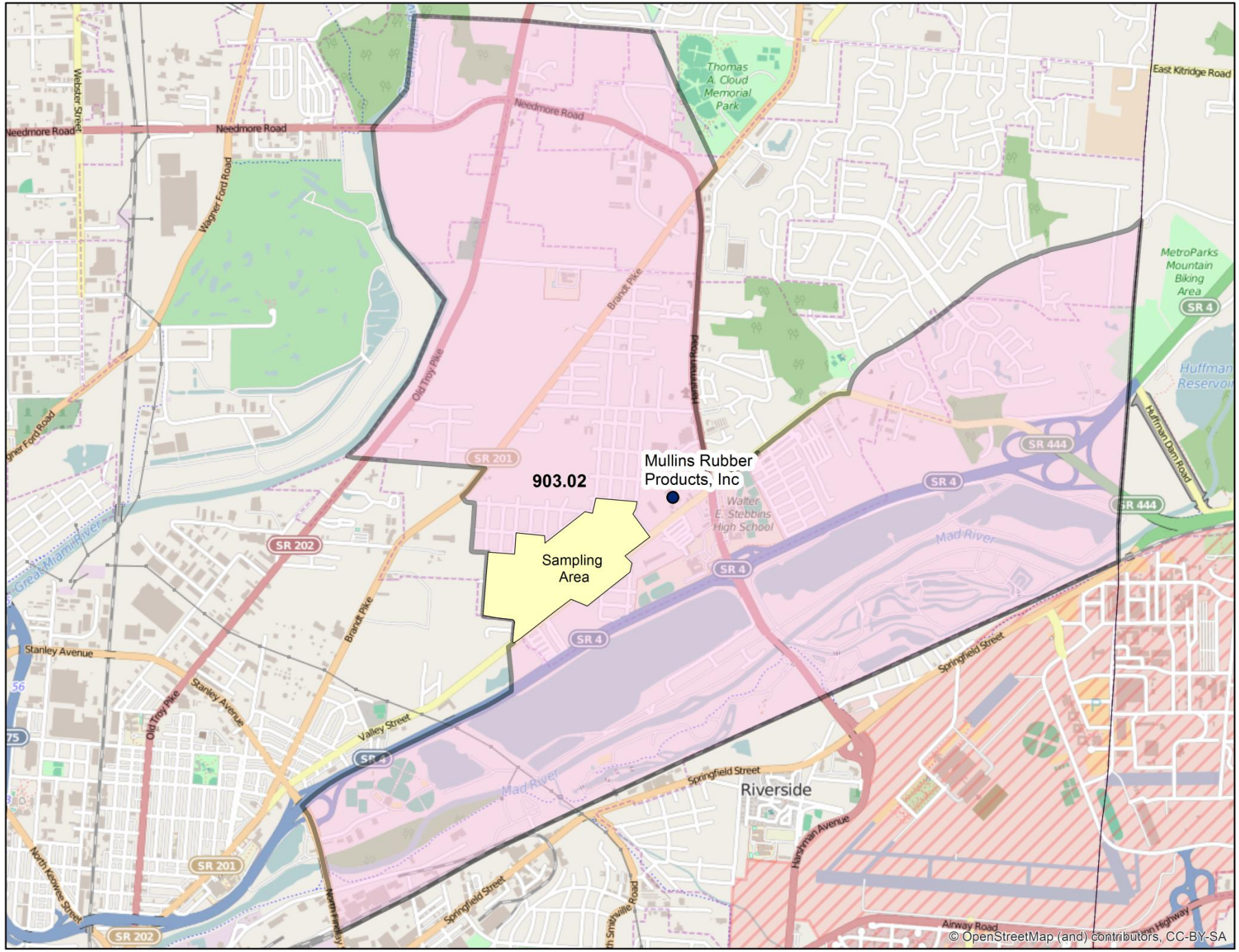
Population - 6,296 residents

Sex	
Male	49%
Female	51%

Race	
White	85%
Black	8%
Asian	3%
Other Race	4%

Age	
Under 5	7%
5 to 14	14%
15 to 19	8%
20 to 24	6%
25 to 34	13%
35 to 44	14%
45 to 54	14%
55 to 64	12%
65 to 74	7%
75 to 84	4%
85+	1%

Source: U.S. Census, 2010


903.02
Mullins Rubber Products, Inc
Sampling Area
Needmore Road
Webster Street
Wagner Ford Road
Old Troy Pike
Brandt Pike
Harshman Road
East Kitridge Road
Thomas A. Cloud Memorial Park
MetroParks Mountain Biking Area
Huffman Reservoir
Huffman Dam Road
SR 201
SR 202
SR 4
SR 444
Walter E. Stebbins High School
Great Miami River
Mad River
Stanley Avenue
Valley Street
Springfield Street
Riverside
Hardman Avenue
Airway Road
North Keowee Street
Smithville Road
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WHAT WERE THE RESULTS?

From 1996 to 2012 (17 years), there were 495 invasive cancer cases diagnosed among residents living in CT 903.02.

Cases were:

- 49% male and 51% female
- 96% White
- 21% - 55 to 64,
  30% - 65 to 74,
  and 19% - 75 to 84

On average, 29 new cancer cases are diagnosed annually.

Leading types of cancer*

- 27% Lung Cancer
- 12% Breast Cancer
- 10% Prostate Cancer
- 8% Colorectal Cancer

** These are also the most common cancer types in Ohio and the United States.*

WHAT WERE THE RESULTS? (CONTINUED)

When the number of observed cases was compared to the expected cases occurring in CT 903.02 from 1996 to 2012, the diagnosed cases of lung cancer and non-Hodgkin lymphoma were significantly higher than expected.

LUNG CANCER

- Primary risk factor for lung cancer is tobacco smoking (cigarette, cigar, and/or pipe smoking).
- Other risk factors include secondhand smoke, family history, and environmental exposures to radon, air pollution, asbestos, and arsenic.

More than 75% of lung cancer patients in CT 903.02 reported to be current or former smokers.

NON-HODGKIN LYMPHOMA

No single cause of non-Hodgkin lymphoma (NHL)

- Risk factors include:
  - Age – more common in people older than 60
  - Sex – more common in men
  - Race – more common in Whites
  - Previous exposure to radiation or some chemotherapy drugs
  - Exposure to chemicals such as pesticides, fertilizers, or organic solvents
  - Use of immunosuppressant drugs following organ transplant surgery
  - Infection such as HIV, Epstein-Barr virus, H. pylori, and Human T-lymphottropic virus
  - Autoimmune disease such as Sjögren's syndrome, lupus, or rheumatoid arthritis
  - Inherited immune deficiency syndromes such as Louis-Barr syndrome and Wiskott-Aldrich syndrome

NON-HODGKIN LYMPHOMA

Non-Hodgkin Lymphoma is related to long-term exposure to PCE and TCE.

- It is **not** possible to determine if the exposure to TCE and PCE from Mullins Rubber Products is associated with these cases.
  - There are many other risk factors associated with NHL.
  - A small number of cases of NHL were diagnosed in CT 903.02 over 17 years (31 cases; 6% of cases). The likelihood that these results could have occurred by chance increases.

Overall, community cancer assessments are challenging because the exact cause of each case of cancer is difficult to determine.

There is a lack of case information pertaining to a patient's history of environment exposures, previous residences, health behaviors, and other cancer-related risk factors.

1. The contractor with EPA will complete the sampling of residences and the installation of vapor mitigation systems.

2. PHDMC will continue to monitor non-Hodgkin lymphoma cases in CT 903.02.

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