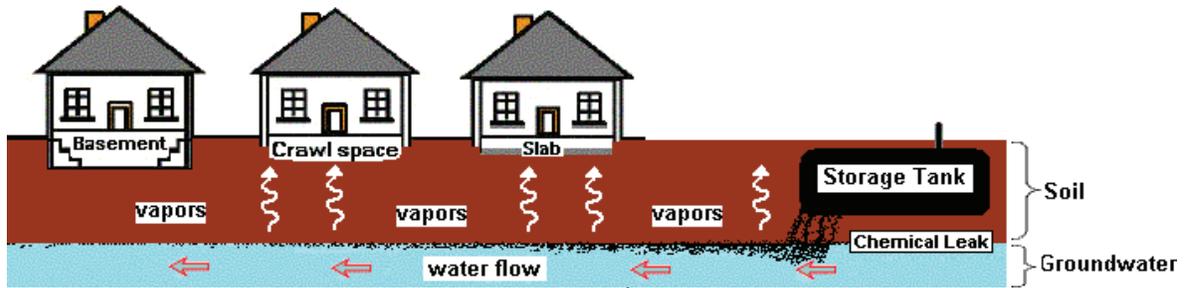




Vapor Intrusion

An Introduction to the Vapor Intrusion to Indoor Air Pathway



What is vapor intrusion?

Vapor intrusion is the migration of volatile organic chemicals (VOCs) from groundwater and/or subsurface soil into overlying buildings. VOCs are a group of chemicals that easily produce vapors. 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. Vapors from contaminated soil and/or groundwater can travel through soils, especially if the soils are sandy and loose or have cracks (fissures). These vapors can then enter a home through cracks in the foundation or into a basement with a dirt floor.

Sources of VOCs

VOCs can be found in petroleum products such as gasoline or diesel fuels, in solvents used for industrial cleaning and are used in dry cleaning.

VOCs are also found in everyday household products. Common products such as paint, paint strippers and thinners, hobby supplies (glues), 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.

The following web site from the National Institutes of Health and National Library of Medicine contains more information about household products that contain VOCs:
<http://hpd.nlm.nih.gov/products.htm>.



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, and lifestyle: Young children, the elderly and people with chronic (on-going) health problems are more at risk from 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. 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?

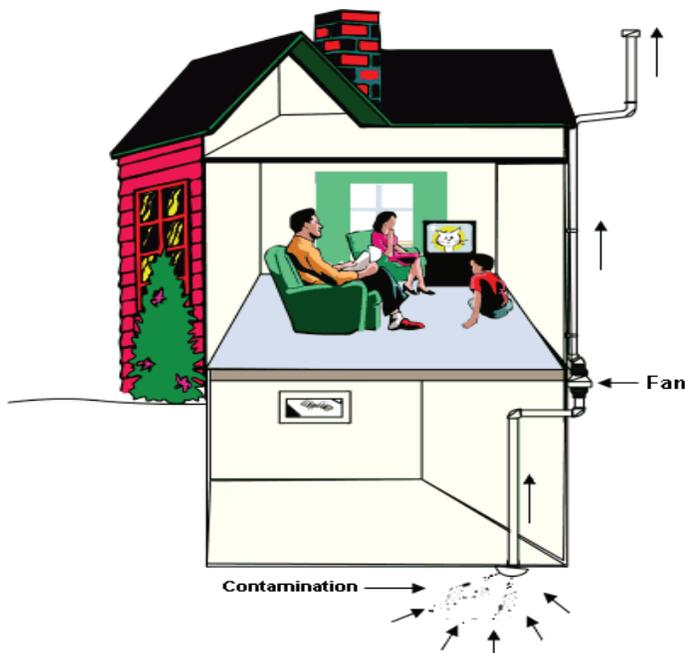
In most cases, collecting soil gas or groundwater samples near the spill site is done first to see if there is on-site contamination. If soil vapors or groundwater contamination are detected at a spill site, EPA may then ask that soil vapor samples be taken from areas outside the immediate spill site and near any potentially affected business or homes.

Soil gas sampling results are then compared to health-based screening levels. Health-based screening levels are concentrations of hazardous chemicals in soil gas that are considered to be below thresholds of concern for risks to human health. If chemicals in soil gas are above their screening level then indoor air sampling will be conducted. Usually samples will be taken from beneath the building's foundation (called sub-slab samples) and inside the building. Outdoor air is also sampled to determine background levels of chemicals. Before any sampling is done on private property, the owner and occupant are contacted by EPA for permission to sample.

What happens if a vapor intrusion problem is found?

If vapor intrusion is having an effect on the air in your home, the most common solution is to install a *vapor mitigation system*. A vapor mitigation system (which is used extensively in situations where radon is of concern) will prevent gases in the soil from entering the home. A low amount of suction is applied below the foundation and the vapors are vented to the outside. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. Usually, the party responsible for cleaning up the contamination is also responsible for paying for the installation of this system. Once the contamination is cleaned up, the system should no longer be needed.

Vapor Mitigation System



What can you do to improve your indoor air quality?

The following helpful hints will help improve air quality inside your home:

- ❖ Do not buy more chemicals than you need and know what products contain VOCs.
- ❖ If you have a garage or an out building such as a shed, place the properly stored VOC containing chemicals outside and away from your family living areas.
- ❖ Immediately clean and ventilate any VOC spill area.
- ❖ If you smoke, go outside and/or open the windows to ventilate the second-hand, VOC containing smoke outdoors.
- ❖ Fresh air will help prevent the buildup of chemical vapors in indoor air. Occasionally open the windows and doors and ventilate.

For more information contact:

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