CHESTER COUNTY HEALTH DEPARTMENT
Bureau of Environmental Health Protection
Division of Water & Sewage

Concerns about TCE

Chester County Health Department has worked with the Agency for Toxic Substances and Disease Registry Presented (ATSDR) to accumulate information on TCE and how it relates to Chester County.

Trichloroethylene is a chemical that is categorized as a *volatile organic compound* (VOC). One of the main features about a volatile organic compound is that it can change from a liquid state to a vapor (or gaseous) state. In other words, if Trichloroethylene is in drinking water it can be released into the air when a faucet is turned on.

Trichloroethylene is also called many other names including TCE; trichloroethene, 1, 1, 2-trichloroethylene; trichlororide; ethylene trichloride; 1, 1-dichloro-2-chloroethylene; Acetylene trichloride and more. It is most commonly known as TCE.

The following information has been given to CCHD by ATSDR.

> **This fact sheet answers the most frequently asked health questions about trichloroethylene. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important 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.**
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> **HIGHLIGHTS: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).**

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

- Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.
Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.
Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.
Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.
Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.
In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is “reasonably anticipated to be a human carcinogen.” The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is “probably carcinogenic to humans.”

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

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.
Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.
The EPA has also developed regulations for the handling and disposal of trichloroethylene.
The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2003. Managing Hazardous Materials Incidents. Volume III – Medical Management Guidelines for Acute Chemical Exposures: Trichloroethylene (TCE). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
Agency for Toxic Substances and Disease Registry (ATSDR). 1997. Toxicological Profile for trichloroethylene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

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.
For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333
Phone: 1-888-42-ATSDR (1-888-422-8737)
FAX: (404)-498-0093
Email: ATSDRIC@cdc.gov

So how does this relate to Chester County? There are 11 known sites in Chester County that are on the National Priorities List. These sites are also called Superfund Sites. A Superfund Site is an area of land that has been so contaminated by toxic substances that the federal government must intercede and develop a plan to clean up the area. The parties who were responsible for the contamination are held accountable and must pay for the effort to clean up the site. However, the cost can be enormous and so the government, to help with the great expense, established a “super fund.”

Each Superfund Site has unique characteristics, depending on what contaminants were found within it. The map below shows the locations and names of the sites in Chester County. For many years Chester County Health Department, the Chester County Water Resources Authority, and the US Geological Survey (USGS) have joined forces to study the County ground water and surface water. Each year, wells in different areas of the County are targeted and sampled for a myriad of things such as bacteria, pesticides, VOCs, metals and other contaminants. Studies have reported that TCE has been found only in a relatively small number of the hundreds of sampled wells.

The following sites have TCE listed as a contaminant:

- Old Wilmington Road – West Caln Township
- Kimberton – East Pikeland Township
- Recticon/Allied Steel Corp. – East Coventry
- Blosenski Landfill – West Caln Township
- Strasburg Landfill – Newlin Township
- William Dick Lagoons – West Caln Township
- AIW Frank/Mid-County Mustang – West Whiteland Township
- Malvern TCE Site – East Whiteland Township
- Barkman's/Welsh Landfill – Honey Brook Township

TCE was found to be a very common contaminant. While TCE spreads easily through the soil and ground water, studies have suggested that the dispersion is still relatively localized and does not travel long distances from the source of the contamination.

If you wonder whether your well water may be contaminated with TCE and you would like to have it tested, there are state-certified labs in Chester County (and beyond) that will analyze your water sample.

Brandywine Science Center, Inc.
204A Line Rd.
Kennett Square, PA 19348
610.444.9850

Cedar Grove Environmental Labs Inc
100 Gallagherville Rd.
Downingtown, PA 19335
610.269.6977

H.O. Thompson Testing Lab
104 Valley View Drive
Parkesburg, PA 19365
610.593.5030

Kennett Laboratories, Inc.
209 E. Maple ST., P.O. Box 162
Kennett Square, PA 19348
610.444.3900

Lionville Laboratory
209 Welsh Pool Rd.
Lionville, PA 19341
610.280.3000

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601
717.656.2300

When you call, tell the lab that you would like your water analyzed for TCE. It will most likely be included in a VOC suite of chemicals that the lab checks. The cost may be approximately $150.

If you have questions after reading your lab results, please call CCHD or ATSDR.