TRICHLOROETHYLENE (TCE)

Shaw Air Force Base, S.C.

Trichloroethylene, commonly called TCE, is a nonflammable, colorless liquid with a somewhat sweet odor and burning taste.

Trichloroethylene has many industrial uses, including as a cleaner to remove grease from metal parts. Between its introduction in 1925 until the 1950s, it was used in dry cleaning. It has also been used as an ingredient in glues, paint removers, office correction fluids and spot removers.

As a result of the manufacture, use and disposal of the chemical for decades, it has been found around the nation in many locations in ground- and surface water.

The Air Force has significantly reduced its use of TCE during the past 25 years. But before that, the compound was used here in airfield activities, which led to the unintended release of TCE into the environment, including groundwater. In water, an area of contamination is called a “plume.”

It has been found in groundwater in six locations, identified as sites FT001, OT-16B, OT-16C, SS-35, SS-36 and CG-38. Three of those plumes (at sites OT-16B, SS-35 and SS-36) have impacted the Upper Black Creek Aquifer, which is a drinking water source located 150 feet below ground surface. At sites OT-16B and SS-35, treatment systems, including pump and treat system with air stripper and an In Situ Chemical Oxidation injection system, have been used to clean the groundwater of TCE to eliminate exposure.

At site SS-36, the Air Force is finalizing field investigations to determine the best treatment system to use.

It is worth noting, the amount of TCE in groundwater here is VERY dilute (a few parts of tri- or tetrachloroethylene per billion parts of water) compared to the compounds in their original form (thousands of parts per million).

The Air Force has installed air strippers on base drinking water wells to ensure a safe drinking water supply for base workers and residents. Off base, most people living over TCE plumes get clean water from High Hills Rural Water Company. The South Carolina Department of Health and Environmental Control oversees the process.

WHAT HAPPENS TO TCE WHEN IT ENTERS THE ENVIRONMENT?

Trichloroethylene dissolves a little in water, but it can remain in groundwater for a long time. It quickly evaporates from surface water, so it is commonly found as a vapor in the air. It evaporates less easily from the soil than from surface water.

It may stick to particles and remain for a long time. It can stick to particles in water, which will cause it to eventually settle to the bottom sediment. However, TCE does not build up significantly in plants and animals.

WHAT ARE REGULATORY STANDARDS FOR TRICHLOROETHYLENE?

State and federal drinking water standards for TCE are both set at five parts per billion.

HOW MIGHT I BE EXPOSED TO TRICHLOROETHYLENE?

There are a few ways people may potentially be exposed to TCE:

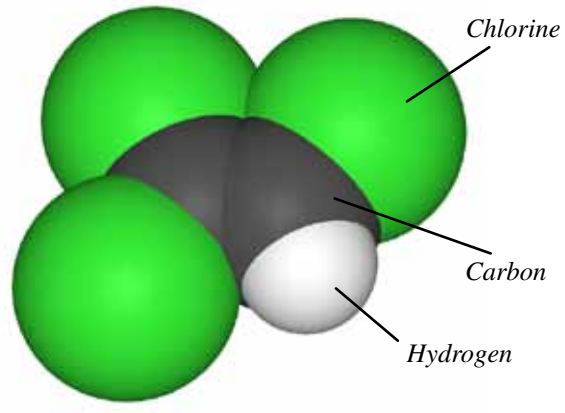
- Breathing air in workplaces where it is used or made;
- Using products that contain TCE;
- Drinking groundwater containing TCE;
- Low levels in some consumer products.

HOW CAN TRICHLOROETHYLENE AFFECT MY HEALTH?

If a person were to come into direct contact with a small amount of full-strength TCE, it can cause headaches, lung irritation, poor coordination and difficulty concentrating. Exposure to large amounts of pure TCE may cause impaired heart function, unconsciousness and death. Breathing it’s vapors for long periods may cause nerve, kidney and liver damage.

Since discovery of trace amounts of TCE in groundwater, Shaw has taken aggressive steps to thoroughly investigate and install treatment systems on the highly diluted TCE plumes, or to further dilute its presence, and has enacted land use controls to reduce or eliminate TCE exposure risk among humans on and around the base.

TCE Molecule



In decades prior to the 1970s, aircraft degreasing processes utilized solvents containing TCE. The use of these solvents resulted in the release of TCE into the environment at Shaw A.F.B. Since then, the Air Force has decreased its use of TCE and since 1976 has instituted strict controls for the transport, handling, storage and disposal of all hazardous substances required for its operations.

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U.S. Environmental Protection Agency: **www.epa.gov**
South Carolina Department of Health & Environmental Control: **www.scdhec.gov**