



Superfund Fact Sheet: Trichloroethylene

Office of Emergency and Remedial Response
Hazardous Site Control Division (5203G)

Quick Reference Fact Sheet

Many chemicals are found at Superfund hazardous waste sites. The Superfund Program's mission includes identifying the chemicals, evaluating their potential health effects on the people who live, work, or play nearby, keeping the public informed, and supervising the cleanup of the site.

This fact sheet is one in a series produced by the Superfund Program. It is intended for readers with no formal scientific training. It is based on an EPA draft Criteria Document and a Toxicological Profile prepared in 1989 by the Agency for Toxic Substances and Disease Registry (U.S. Public Health Service).

What is trichloroethylene?

Trichloroethylene (TCE) is a man-made chemical. At room temperature, it is a colorless liquid with an odor like ether or chloroform. TCE is a very volatile compound. It is used as a solvent, mostly to remove grease from metal parts. It is also a component of other chemicals.

TCE is commonly among the contaminants at Superfund sites. In combination with other chemicals, TCE may have a synergistic action on the toxicity of the mixture. This means that the combined effect of two (or more) chemicals is much greater than would be predicted by simply adding the effects of the two.

How are people exposed to trichloroethylene?

We are all exposed to low, background levels of TCE in the air, and many people are exposed to it in drinking water. We inhale tiny amounts of TCE each day, varying by where we live.

Many lakes, streams, and underground water deposits that are sources of drinking water also have background levels of TCE. Federal and State surveys indicate that 9 to 34 percent of the water supply sources in the United States may be contaminated to some degree with TCE.

Higher levels of TCE exposure can be associated with:

- Evaporation to the atmosphere from handling contaminated soil and water;
- Evaporation from adhesive glues, paints and paint removers, spot removers, rug cleaners, and other chemicals;
- Burning and air-cleaning at waste treatment plants that receive wastewater containing TCE; and
- Former use in the commercial dry-cleaning industry.

At hazardous-waste disposal sites, such as those included in Superfund, TCE is released to the air by evaporation and into underground water by passing through the soil. TCE has been found in at least 39 percent of the hazardous waste sites on the National Priorities List.

In conducting site investigations, EPA may determine that although TCE is

found at a site, there is little chance that people will come into contact with it. If there is no probability of exposure to the TCE, and there is no reason to believe that there will be in the future, then the TCE at the site poses no risk.

The type of health problems an individual might experience depends on the chemical, how much of the chemical a person is exposed to and how long the exposure lasts. Some chemicals are harmful in small amounts and other chemicals are not harmful even in very large amounts.

How does trichloroethylene get into the body?

The most common way for TCE to enter the body is in drinking water. TCE can also enter the body by breathing TCE vapors or through the skin. Federal information indicates that most of the U.S. population using public water supplies drinks water containing less than 0.5 parts per billion (ppb) TCE. This level is ten times less than the current Federal drinking water standard for TCE. TCE levels in public drinking water are closely monitored and regulated under the Federal Safe Drinking Water Act. If TCE has made its way into the drinking water and exceeds allowable levels, temporary safety measures may have to be offered.

Is there a medical test to determine exposure to trichloroethylene?

Although EPA does not generally conduct tests, recent TCE intake can be determined by measuring TCE in the breath. Another way to determine TCE intake is by measuring breakdown products (metabolites) of TCE in the urine or blood. Because trichloroacetic acid is removed very slowly from the body, it can be measured in the urine for up to a week after exposure to TCE. This test cannot prove TCE intake, however, because other chemicals produce the same breakdown products in the urine and blood.

How can trichloroethylene affect people's health?

One or more of the following symptoms have occurred in people who drank TCE by mistake (or as a substitute for alcohol) or who breathed TCE at work or in poorly ventilated areas: nausea, dizziness, headache, sleepiness, numbness of the face and hands, inability to grasp objects, irregularities of the heart beat (some can be lethal), transient liver damage, unconsciousness, coma, and, rarely, death.

If you believe you have been exposed to harmful levels of TCE, you should contact your physician and report the situation to the EPA Community Relations Coordinator (CRC) assigned to your Region. Telephone numbers for CRCs are given at the end of this fact sheet.

Although most of the effects TCE has on human health gradually disappear when intake ends, animal studies suggest the potential for some long-term health problems in people. Breathing or ingesting high levels of TCE can produce liver and kidney damage, nervous system changes, effects on the blood, tumors of the liver, kidney, lung, and male sex organs, and possibly white blood cell cancer (leukemia) in animals. A few studies in pregnant animals exposed to TCE in air or food showed effects on unborn animals and newborns.

What recommendations has the Federal government made to protect human health?

In January 1989, EPA established a drinking water standard for TCE. This level applies to community water systems and those that serve the same 25 or more persons for at least 6 months of the year. TCE levels in workplace air are regulated by the Occupational Safety and Health Administration (OSHA).

EPA also requires industry to report TCE spills of 1,000 pounds or more. A reduction to a 100-pound level has been proposed.

At specific Superfund sites, EPA makes every effort to monitor TCE levels and safeguard public health. EPA investigators determine if there are excessive levels of TCE, what risks they pose for people, and how the cleanup can bring TCE levels to safe, approved limits. While the cleanup is underway, temporary safety measures may need to be offered. For example, if TCE has made its way into drinking water, an alternate source may have to be supplied, or if it has entered the food chain, consumption of affected fish, animals, or milk may have to be banned.

**Where can I get
more information on
this chemical?**

This fact sheet has been designed to provide general information on trichloroethylene. More information about TCE at a specific site is available from the Community Relations Coordinator (CRC) for each EPA Region. Community Relations Offices are listed on the back of this fact sheet.

For additional technical details and a review of current research, contact EPA's Safe Drinking Water Hotline at 1-800-426-4791 or see the Agency for Toxic Substances and Disease Registry's Toxicological Profile for Trichloroethylene. Information on obtaining this profile is available by calling ATSDR's Toxicology Information Service, at (404) 639-6000. The information service is accessible 24 hours per day by touchtone phone.

Regional Superfund Community Relations Offices

Region 1

Superfund Community Relations
Office of Public Affairs
EPA Region 1 (RPA-74)
#1 Congress Street
Boston, MA 02203
(617) 565-3425

Region 2

Community Relations Branch
External Programs Division
EPA Region 2 (2-EPD)
26 Federal Plaza
New York, NY 10278
(212) 264-7054

Region 3

Superfund Community Relations
Office of External Affairs
EPA Region 3 (3EA21)
841 Chestnut Street
Philadelphia, PA 19107
(215) 597-9905

Region 4

Superfund Community Relations
Waste Management Division
EPA Region 4
345 Courtland Street, N.E.
Atlanta, GA 30365
(404) 347-2643

Region 5

Superfund Community Relations
Office of Public Affairs
EPA Region 5
Metcalf Federal Bldg.
77 West Jackson Blvd.
Chicago, IL 60604
(312) 353-2073

Region 6

Superfund Community Relations
Hazardous Waste Mgmt. Division
EPA Region 6 (6H-SS)
1445 Ross Avenue
12th Floor, Suite 1200
Dallas, TX 75270
(214) 655-2240

Region 7

Community Relations
Office of Public Affairs
EPA Region 7
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7003

Region 8

Community Relations Branch
Office of External Affairs
EPA Region 8 (80EA)
1 Denver Place
999 18th Street, Suite 1300
Denver, CO 80202
(303) 294-1144

Region 9

Superfund Community Relations
Hazardous Waste Mgmt. Division
EPA Region 9 (T-1-3)
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-2178

Region 10

Community Relations Section
Hazardous Waste Division
EPA Region 10 (HW117)
1200 6th Avenue
Seattle, WA 98101
(206) 553-6901



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Environmental Protection
Agency (5203G)
Washington, DC 20460

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