

Cis-1,2-dichloroethene and Drinking Water

Cis-1,2-dichloroethene is a contaminant that has been found in waters that could be used as drinking water sources in Minnesota. The Minnesota Department of Health (MDH) developed a health-based guidance value for cis-1,2-dichloroethene in drinking water and, based on this value, have not detected harmful levels in public drinking water supplies.

What is cis-1,2-dichloroethene?

Cis-1,2-dichloroethene is used as an intermediate in making chlorinated solvents and compounds. It is a solvent used in waxes, resins, perfumes, dyes, acetylcellulose (a film for photography), lacquers, thermoplastics, fats and phenols. It is also used to extract rubber, extracting oils and fat from fish and meat, in manufacturing pharmaceuticals, in making artificial pearls, and extracting caffeine from coffee.^{1,2} Cis-1,2-dichloroethene is a degradation product of both tetrachloroethylene (PCE) and trichloroethylene (TCE). PCE and TCE are contaminants found in Minnesota groundwater.³

Has cis-1,2-dichloroethene been found in Minnesota water?

Cis-1,2-dichloroethene has been detected in Minnesota's groundwater at levels above health guidance values. Cis-1,2-dichloroethene is typically detected near industrial or commercial clean-up sites, where monitoring and treatment are in place to improve water quality.⁴

Cis-1,2-dichloroethene is routinely monitored and has been detected in public drinking water supply wells at levels ranging from 0.2 parts per billion (ppb) to 20 ppb. After drinking water is treated, levels are much lower or not detectable.

What is the MDH guidance value for cis-1,2-dichloroethene in drinking water?

Based on available information, MDH developed a guidance value of 6 parts per billion (ppb) for cis-1,2-dichloroethene. A person drinking water at or below this level would have little or no risk of health effects.

Can cis-1,2-dichloroethene in drinking water affect my health?

Short term exposures to high levels of cis-1,2-dichloroethene resulted in over 15 percent increased liver weight in laboratory animals. Longer exposures resulted in increased kidney weights of greater than 15 percent. Increased organ weights may be an early indicator of organ injury or dysfunction.

At a Glance

Cis-1,2-dichloroethene is...

- an industrial solvent.
- a breakdown product of TCE and PCE.

Cis-1,2-dichloroethene enters your body from...

- breathing it in after it moves from water to air.
- drinking contaminated water.

Your exposure to cis-1,2-dichloroethene can be reduced by...

- being aware of potential cis-1,2-dichloroethylene contamination to your water supply. If you are on a public water supply, read your Consumer Confidence Report. If you are concerned about your private well, you can contact MDH to learn more.

Cis-1,2-dichloroethene in drinking water is safe if...

- the level is at or below the MDH guidance value of 6 ppb.

How am I exposed to cis-1,2-dichloroethene?

You are most likely to be exposed to cis-1,2-dichloroethene by breathing it in or drinking contaminated water. When cis-1,2-dichloroethene is in water, you can breathe vapors from it when showering or cooking with contaminated water. People who work with cis-1,2-dichloroethene may also absorb it through their skin if they come into contact with it.

How does cis-1,2-dichloroethene get into the environment?

Cis-1,2-dichloroethene enters the environment when it is discharged to water or improperly disposed of on land. Cis-1,2-dichloroethene is also formed in the environment when the contaminants TCE and PCE break down in soil and water. TCE and PCE are industrial solvents commonly used in metal cleaning, dry cleaning, or textile processing.

What are the potential environmental impacts of cis-1,2-dichloroethene?

The ecological risk of cis-1,2-dichloroethene is not well understood. Based on limited laboratory studies, cis-1,2-dichloroethene does not appear to present a substantial risk to plants and animals that live in Minnesota waters. However, cis-1,2-dichloroethene may be harmful to aquatic life if a spill or discharge into the environment occurs and results in relatively high levels of cis-1,2-dichloroethene contamination.

What Minnesotans Need to Know . . .

Cis-1,2-dichloroethene has been found at levels above health guidance values in Minnesota groundwater. Cis-1,2-dichloroethene can be harmful to health if it is ingested by drinking contaminated water or if it is breathed in after it evaporates from contaminated water. Minnesotans who think their well water may be impacted by cis-1,2-dichloroethene, perhaps because of known TCE or PCE pollution nearby, can contact MDH for more information. Minnesotans who rely on public water supplies for their drinking water can read their annual Consumer Confidence Report (CCR) for more information on whether cis-1,2-dichloroethene has been found in their water. A CCR is an annual water quality report that summarizes information on water sources, detected contaminants, and compliance information. You can usually review your CCR on your water supplier's website or you can request a printed copy from your water supplier.

For more information contact:

Health Risk Assessment

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The Health Risk Assessment Unit...

evaluates the health risks from contaminants in groundwater. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

1. Hazardous Substances Data Bank (HSDB). 2014. U.S. National Library of Medicine. Cis-1,2-dichloroethylene Retrieved from <http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@rn+@rel+156-59-2> Accessed June 10, 2014.
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3. Minnesota Pollution Control Agency (MPCA). 2014. Health Risk Limit Interagency Prioritization Meeting.
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