May 2015
National Tribal Toxics Council

Fact Sheet
Tribal Outreach

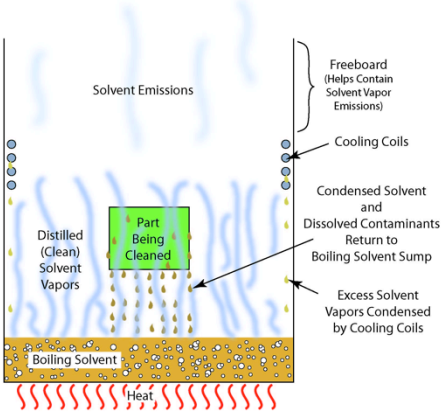
Trichloroethylene (TCE) Uses, Exposure, and Health Effects

This fact sheet provides information on how people and resources may be exposed to trichloroethylene and health effects for tribes to consider for developing comments during EPA's tribal consultation period (April 21, 2015 – June 30, 2015) on the proposed rulemaking under the Toxic Substances Control Act (TSCA) for TCE in certain uses. Decisions concerning TSCA Section 6(a) regulations may affect tribal populations' exposure to TCE and businesses in Indian Country using these products. In addition to immediate exposure, once spilled, TCE can travel through soil and groundwater and in some cases contaminating drinking water and indoor air, where the affects become more widespread through inhalation and ingestion. Your comments may influence EPA's regulatory action to adequately protect people against the risks associated with the use of TCE and may limit further exposure to this toxic chemical through tribal resources.

What is TCE? Trichloroethylene (TCE) is a toxic chemical that is commonly used as a solvent. It is a clear, colorless liquid that has a sweet odor and is highly volatile, meaning that it quickly produces vapors. The majority (~84 percent) of the 250 million pounds used each year is used in closed systems as an intermediate chemical for manufacturing refrigerant chemicals, ~15 percent as a solvent to remove grease from metal parts - particularly in the automotive industry and metal machining industry, and the remaining small percentage accounts for other uses including use in consumer products. Consumer products include spray degreasers, lubricants, paints, paint removers, adhesives such as protective coating to finish prints or artwork, and as spot removers and rug-cleaning fluids.

TCE uses being considered for regulation under TSCA Section 6(a) are:

- Commercial use of TCE in open top vapor degreasing at commercial shops (both precision and non-precision cleaning).
- Consumer and commercial use of TCE in spray degreasers.
- Consumer use of TCE in clear protective coating sprays.
- Commercial use of TCE as a spotting agent in dry cleaning.



What are the potential risks to people? EPA's risk assessment evaluated human health risks to consumers and workers, including bystanders, from inhalation exposures. Single (acute) or short-term exposure can potentially affect the developing fetus. High acute concentrations of TCE vapors can irritate the respiratory system and skin and induce central nervous system effects such as light-headedness, drowsiness, and headaches. Repeated (chronic) exposure or prolonged exposure to TCE has been associated with effects in the liver, kidneys, immune system, and central nervous system. EPA has concerns for effects in the developing fetus from both acute and chronic exposure. TCE is carcinogenic to humans by all routes of exposure.

Questions:

Dianne Barton, NTTC Chair, bard@critfc.org, 503-731-1259 www.tribaltoxics.org – "Hot Topics"

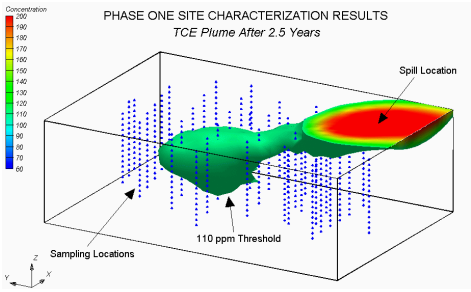
May 2015
National Tribal Toxics Council

Fact Sheet
Tribal Outreach

Trichloroethylene (TCE) Uses, Exposure, and Health Effects

What happens when TCE is released into our water?

The public health significance of groundwater contamination that results in a release of TCE (from auto repair shops, metal industry, military installations, dry cleaners, etc.) often results in a Superfund site to be added to the National Priorities List for cleanup prior to residents using local groundwater wells (private or community supply). Exposure does not just occur from drinking the water, but can also volatize out of the water exposing people to TCE when taking showers. TCE may also volatilize out of contaminated soil and groundwater, contaminating the air in homes, which is defined as vapor intrusion.



Example of a TCE plume after 2.5 years.

TCE will persist and travel through soil and groundwater for years. In an effort to raise public awareness about the underground toxic plume of TCE that is slowly moving to the Greylock well in North Adams' West End, college students created a 5-minute documentary: www.youtube.com/watch?v=mzqahyk01bY.

How has TCE affected tribes?

Tribes, such as the Santa Clara Pueblo, have been affected by TCE. A summary of the North Railroad Avenue Plume site in New Mexico (within the exterior boundaries of the Santa Clara Indian Reservation) can be accessed at http://www.epa.gov/earth1r6/6sf/pdffiles/north-railroad-ave-nm.pdf. Additionally, the Agency for Toxic Substances and Disease Registry has prepared a public health assessment for the site, available at http://www.atsdr.cdc.gov/hac/pha/pha.asp?docid=1204&pg=1#sum.

While speaking with Dino Chavarria, Santa Clara Pueblo Environmental Director, NTTC support staff learned that they recently provided the community an update on the site in their quarterly newsletter in response to the many questions that continue to come into their office. Santa Clara environmental staff collaborate with EPA and the state to monitor the site, ensuring the safety of their members and resources. Tribal engagement in the Superfund process was critical for including consideration of traditional and cultural use of Pueblo resources. The Rio Grande is a Santa Clara Pueblo resource that was being impacted by the TCE plume of contamination. The Rio has been a source of irrigation, recreation, and a vital part of the Pueblo's culture for a thousand years. "TCE and PCE will break down to Vinyl Chloride, a carcinogen. It was important that the remedy selected to clean this site would prevent it from spreading even further onto Pueblo lands but also break down the TCE to harmless constituents. TCE is such a persistent chemical in the environment. It will not easily dissolve and can even degrade clay layers and further contaminate groundwater. Any tribal community near a facility that has used TCE for degreasing or dry cleaning should be vigilant about contamination that isn't easily detected."


Santa Clara Pueblo staff, Shawn Chato and Brian Suazo, collect water samples from the Rio Grande, ensuring their resource continues to be free of TCE.

There are currently 852 Superfund sites in which TCE is a contaminant of concern and several of which it is the primary contaminant of concern. A recent report under the Emergency Planning and Community Right-To-Know Act (EPRCA) shows that 525 facilities nationwide released over 8 million pounds of TCE to the air, 400 pounds to surface water, and 12,600 pounds to the land.

Additional Resources on TCE (also used in the development of this fact sheet)

What is TCE? 2:06 video https://www.youtube.com/watch?v=jEdMpf-jHwM
ATSDR ToxFAQs http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=172&tid=30
ATSDR Camp Lejeune Site Information http://www.atsdr.cdc.gov/sites/lejeune/index.html
Encyclopedia of Earth TCE Contamination of Groundwater http://www.eoearth.org/view/article/156394/
NY Department of Health TCE in Indoor and Outdoor Air
https://www.health.ny.gov/environmental/investigations/soil_gas/svi_guidance/fs_tce.htm
US EPA OPPT Fact Sheet on Trichloroethylene (TCE) http://www.epa.gov/oppt/existingchemicals/pubs/tce_qa.html
US EPA TCE Final Risk Assessment (June 2014)
http://www.epa.gov/oppt/existingchemicals/pubs/TCE_OPPTWorkplanChemRA_FINAL_062414.pdf
US EPA Technical Factsheet on TCE http://www.epa.gov/ogwdw/pdfs/factsheets/voc/tech/trichlor.pdf