Billings PCE Groundwater State Superfund Site
Frequently Asked Questions
July 25, 2019

1. What are the primary contaminants of concern?

The primary focus of this investigation are chlorinated compounds, mostly tetrachloroethylene (PCE) and trichloroethylene (TCE). DEQ also discovered some petroleum compounds. PCE is a synthetic chemical that is widely used for dry cleaning of fabrics and for metal-degreasing operations. It is also used as a starting material (building block) for making other chemicals and is used in some consumer products. PCE is a nonflammable, colorless liquid at room temperature and has a sharp, sweet odor. Other names for PCE include perchloroethylene, perc, tetrachloroethene, perclene and perchlor. Under certain conditions, PCE can breakdown into other compounds like TCE.

Petroleum compounds is a term used to describe a large family of several hundred chemical compounds that are found in petroleum products like gasoline and diesel fuel, which can contaminate the environment.

2. What happens to chlorinated and petroleum compounds when they get into the environment?

Many of the chlorinated compounds, like PCE and TCE that get into water and soil will evaporate into the air. However, because PCE and TCE can travel through soils quite easily, they can get into underground water. If they get into underground water, they may stay there for many months without being broken down. Under certain conditions, bacteria will break down PCE and TCE, and some of the chemicals formed may also be harmful. Under some conditions, PCE and TCE may stick to the soil and stay there. PCE and TCE do not seem to build up in animals that live in water, such as fish, clams and oysters. They also do not seem to build up in plants.

The petroleum compounds found at this site can also enter the environment in the same way as PCE and TCE and evaporate into air. However, they are more likely to break down into chemicals that are not as harmful. Both the chlorinated compounds and the petroleum compounds found at Billings PCE are considered “volatile,” which means that they evaporate easily into soil vapor and indoor air.

3. How might I be exposed to PCE and how does it affect my health?

The City of Billings drinking water comes from the Yellowstone River and is not contaminated by the chemicals found at the Billings PCE Groundwater site. Surface and subsurface soil do not contain levels that would pose a risk from directly contacting the soil. You might be exposed to contaminated water if you drink water from an irrigation well or use irrigation water for

recreational purposes. Contamination from beneath the ground can evaporate and move into some overlying structures and into indoor air.

Exposure to very high concentrations of PCE and TCE can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness and death. The U.S. Department of Health and Human Services (DHHS) has determined that PCE may reasonably be anticipated to be cancer-causing and that TCE is known to cause cancer in humans. Exposure to some petroleum compounds can affect your nervous system, causing headaches and dizziness. Some petroleum compounds, like benzene, are also known to cause cancer in humans. Not everyone that is exposed to contamination will experience health effects. The potential for developing any of these health effects is based upon the amount of contamination that is present and how long a person is exposed to the contamination.

4. Is there a medical test to show whether I have been exposed to PCE or TCE?

A blood test cannot distinguish site related PCE from other sources of PCE. This is further complicated by the relatively short time that PCE stays in blood (the liver constantly filters PCE from the blood). In addition, there are no valid studies that indicate what PCE levels in blood may be associated with health effects. Toxicological studies and an evaluation of exposure from environmental samples provides a better understanding of health risks at this site.

5. Can the contaminant get inside the house, and how?

Volatile chemicals in contaminated soils and/or contaminated underground water can emit vapors that may move through the soil and into air in overlying buildings. This phenomenon is generally referred to as vapor intrusion. Contaminated vapors typically enter buildings through cracks in basements and foundations, sewer lines and other openings. Other factors such as contaminant concentrations, depth of contamination, depth to underground water, and building construction and condition can also influence how vapors can move into overlying buildings. Vapor intrusion becomes a concern if vapors build up to a point where the health of residents or workers in those buildings could potentially be at risk.

6. Are there other sources of volatile chemicals in my indoor air?

There are other potential sources of contaminants in indoor air. Volatile chemicals may also be found in certain household products such as paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals may be present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are also potential sources of volatile organic compounds to outdoor air. At this site, DEQ evaluated outdoor, upwind locations on the same day downwind structures were sampled so that outdoor air contribution could be factored into the vapor intrusion evaluation. DEQ looked at volatile chemicals in homes that were not located near known contamination. The results of the study are summarized in the

Montana Typical Background Indoor Air Concentrations document at http://deq.mt.gov/Land/statesuperfund/vaporintrusion. This information was also used to help determine if vapor intrusion was occurring.

7. Are there ways to stop vapor intrusion?

Yes, there are ways to limit or stop vapors from moving into overlying buildings. The most effective long-term measure is to remove the source of the contamination. However, other effective measures that can be used to address vapors in individual buildings are listed below:

Mitigation Systems: These are sub-slab depressurization systems that essentially prevent vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside. Mitigation systems are inspected to ensure that they are effective and that they do not cause any back-drafting. The system uses minimal electricity and should not noticeably affect heating and cooling efficiency.

Vapor barriers: A vapor barrier is a sheet of geomembrane or strong plastic that is placed beneath a building. It may be more appropriate for new construction, but may also work for buildings with crawl spaces. It is difficult to retrofit existing buildings with a vapor barrier. However, some concrete floors may be able to be sealed with a substance that may limit the movement of vapors into the building.

Improved Heating, Ventilation, and Air Conditioning (HVAC) Systems: In some situations, HVAC systems may be adjusted to increase the indoor pressure relative to the pressure beneath the building's slab. This approach is typically useful for larger buildings. There are some systems available for forced air systems that can introduce fresh outdoor air into the building, which increases indoor air pressure and dilutes existing stagnant air (e.g., fresh air intake).

8. Who do I contact to get more information or if I want to be involved somehow?

You may call or e-mail the contacts listed below:

For remedial investigation questions contact –
Mike Gipson, DEQ Project Manager at 406-444-6422 or mgipson@mt.gov.

For EPA and National Priorities List questions contact -
Joseph Chisholm, EPA Site Assessment Manager at 303-312-6349 or chisholm.joseph@epa.gov.
Victor Ketellapper, EPA NPL Coordinator at 303-312-6578 or ketellapper.victor@epa.gov.

For individual health concerns contact -
Connie Garrett, DPHHS Epidemiologist at 406-444-5954 or connie.garrett@mt.gov.
Matt Ferguson, DPHHS State Toxicologist at 406-444-3284 or matthew.ferguson@mt.gov.

For more information or to sign up for future mailings visit -
http://deq.mt.gov/Land/statesuperfund/Billings-PCE.