



HEALTH INFORMATION ON Constituents of Concern RELATED TO THE TRIUMPH MINE AREA

ARSENIC

- **Where does arsenic come from?** Arsenic (As) is a naturally occurring element found in the earth's crust. Trace amounts of arsenic are found in our surroundings; localized areas in Blaine County near Triumph Mine have elevated concentrations of arsenic in groundwater. Arsenic is usually found in rocks, soil, water, air, plants, and animals. Most arsenic found in drinking water comes from the rock formations. Water that encounters rock formations or soil can dissolve arsenic and carry it into groundwater aquifers, streams, and rivers that may be used as drinking water sources. Arsenic can be released into the environment through natural activities such as volcanic activity, erosion, and forest fires, or through human activities such as mining, smelting, burning fossil fuels, wood preservative, and pesticide application.
- **What are the health impacts if arsenic is found in drinking water?** Arsenic is associated with health effects such as cardiovascular disease, diabetes, skin changes, nervous system damage, and various forms of cancer. The amount of arsenic in a glass of drinking water in general is typically very small, and any drinking water-related health effects are the result of prolonged exposure over time.
- **How can arsenic be detected in drinking water?** When dissolved in water, arsenic is colorless, odorless, and tasteless, even at high concentrations. Laboratory testing of water is required to evaluate the amount of arsenic present.

LEAD

- **Where does lead come from?** Lead (Pb) is a metal naturally occurring in the earth's crust. Lead in gasoline was banned in 1996 and has been dramatically reduced in other consumer products such as paint, ceramic, and pipes because it's harmful to human health. It is still used in the production of batteries and ammunition. Lead was mined from rock formations at locations such as Triumph Mine.
- **What are the health impacts if lead is found in drinking water?** One way people get exposed to lead is by drinking contaminated water, which results in lead buildup in the body over time. There is no safe concentration of lead exposure. Lead is most dangerous to preschool children, pregnant women, and their fetuses. Exposure causes learning disabilities, behavioral problems, and slow growth. Lead poses a risk to adults by causing memory loss, irritability, high-blood pressure, and muscle or joint pain.
- **How can lead be detected in drinking water?** When dissolved in water, lead is colorless, odorless, and tasteless. Laboratory testing of water is required to evaluate the amount of lead present.

IRON

- **Where does iron come from?** Iron (Fe) is a chemical element commonly found in earth's crust. Different forms of iron are used in a wide variety of everyday materials including construction materials, pigments in paints, plastics, textiles, paper, and nutritional supplements. Iron is essential for good health; it helps transport oxygen in the blood.

- **What are the health impacts if iron is found in drinking water?** Iron may not be harmful to health likely because the body does not readily absorb the chemical form of iron found in water. The recommended threshold value is based on taste and appearance. Excess iron may cause growth of iron bacteria, which are not known to pose a health problem. In general, the amount of iron present in US drinking waters is considered to be low.
- **How can iron be detected in drinking water?** When dissolved in water, at concentrations above the threshold, iron causes taste, odor, and staining problems. Water with iron present can have a harsh unacceptable metallic taste. It may also stain laundry, dishes, glassware, sinks, and tubs. Staining typically has a reddish-brown appearance.

MANGANESE

- **Where does manganese come from?** Manganese (Mn) is a naturally occurring metal found in many rocks and soils. Manganese is used mainly in steel production to improve strength. Manganese is an essential trace element present in most foods and may be added to food or nutritional supplements.
- **What are the health impacts if manganese is found in drinking water?** Too much manganese can harm the nervous system, resulting in behavioral changes and other nervous system effects including tremors and shaking, a condition called Manganism. Some studies have shown that consumption of manganese above the recommended concentrations during early childhood may also have effects on learning and behavior.
- **How can manganese be detected in drinking water?** When dissolved in water, manganese can turn water a brown or rust color, causing staining of faucets and sinks, and can make the water have an off-taste or odor.

SULFATE

- **Where do sulfates come from?** Sulfate (SO₄) is a compound found in nature and occurs naturally in water in various amounts. Sulfates are also found in minerals, soil, rocks, plants, and foods.
- **What are the health impacts if sulfates are found in drinking water?** People who are not used to drinking water with concentrations at or above the threshold for sulfates can develop diarrhea and dehydration.
- **How can sulfates be detected in drinking water?** Generally, when high concentrations of sulfates are dissolved in water, the water may have a bitter taste.

TOTAL DISSOLVED SOLIDS

- **Where do total dissolved solids come from?** Total dissolved solids (TDSs) are a measure of dissolved compounds in the water that can pass through a 2-micrometer sieve. These substances can be organic and inorganic, such as minerals, salts, metals, cations, or anions dissolved in water.
- **What are the health impacts if total dissolved solids are found in drinking water?** Health effects associated with consumption of drinking water with elevated levels of total dissolved solids have not yet been determined.
- **How can total dissolved solids be detected in water?** Since dissolved ionized solids, such as salts and minerals, increase the conductivity of a solution, specialized equipment used by environmental scientists measures the conductivity of the solution and estimates the total dissolved solids from that reading.

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