

Nitrate and Nitrite in Water

What is Nitrate and Nitrite?

Nitrate is a compound that is formed naturally when nitrogen combines with oxygen or ozone. The primary health hazard from drinking water with nitrate-nitrogen occurs when nitrate is transformed to nitrite in the digestive system. The nitrite oxidizes the iron in the hemoglobin of the red blood cells to form methemoglobin, which lacks the oxygen-carrying ability of hemoglobin. The Maximum Contaminant Levels are set at 10 mg/l for nitrate, and 1 mg/l for nitrites.

Where and how does nitrate get into drinking water?

Nitrate can occur naturally in surface and groundwater at a level that does not generally cause health problems. High levels of nitrate in well water often result from improper well construction, well location, overuse of chemical fertilizers, or improper disposal of human and animal waste. Sources of nitrate that can enter your well include fertilizers, septic systems, animal feedlots, industrial waste, and food processing waste. Wells may be more vulnerable to such contamination after flooding, particularly if the wells are shallow, have been dug or bored, or have been submerged by floodwater for long periods of time.

Is Nitrate Dangerous?

Too much nitrate in drinking water poses a risk to pregnant women and infants under six months of age. If an infant is fed water or formula made with water that is high in nitrate, a condition called "blue baby syndrome" (or "methemoglobinemia") can develop. Bacteria which are present in an infant's stomach can convert nitrate to nitrite, a chemical which can interfere with the ability of the infant's blood to carry oxygen. As the condition worsens, the baby's skin turns a bluish color, particularly around the eyes and mouth. If nitrate levels in the water are high enough and prompt medical attention is not received, death can result.

How often should I have my well tested for nitrate and nitrite?

It's a good idea to have a routine nitrate test every two or three years, more frequently if nitrate has been detected in previous sampling. You should also have your water tested for nitrate if you are a woman planning on becoming pregnant or if infants will be using the water.

How do I remove nitrate from my drinking water?

Nitrate may be successfully removed from water using treatment processes such as ion exchange, distillation, and reverse osmosis. If installing a system, be sure to have your water tested to ensure the problem is controlled.

Heating or boiling your water will not remove nitrate. Because some of the water will evaporate during the boiling process, the nitrate levels of water can actually increase slightly in concentration if the water is boiled. Mechanical filters or chemical disinfection, such as chlorination, DO NOT remove nitrate from water.