



CLEAN WATER ACTION

CALIFORNIA

Typical San Joaquin Valley Drinking Water Contaminants: Health Effects

Arsenic (Maximum allowed in drinking water: 10 parts per billion)

Arsenic occurs naturally in many parts of California, and is also produced by some industrial and agricultural activities. Long-term exposure has been linked to cancer, Type 2 Diabetes, and tremors and numbness. Short-term exposure can cause stomach pain, nausea and vomiting, numbness and tingling in the extremities, and skin discoloration or rashes. Arsenic is very common in the Valley. Levels below the drinking water standard are of concern because the maximum allowed in drinking water is 10,000 times the amount identified as the “safe” level (the state Public Health Goal- i.e. the safe limit- is 4 parts per *trillion*). Levels well below the legal limit for drinking water can cause long-term harm.

Manganese (Maximum allowed in drinking water: 50 parts per billion)

While manganese is regulated primarily for its taste and odor, ingesting high levels can have adverse impacts, including causing iron deficiencies and neurological problems. Determining the precise health impacts of a specific level in the water supply is complicated because manganese is a contaminant whose concentration varies in the distribution system. It can settle out of the water in some areas, and be swept up in others. That means that some homes may have significantly higher levels in their tap water than others.

Nitrates (Maximum allowed in drinking water: 45 parts per million)

Nitrate is the most common contaminant in the Valley. The largest source of nitrate contamination in the Valley is leaching from commercial fertilizers. Other sources include dairies and other confined animal feeding operations, food processing plants, septic and sewer systems. Nitrate is an *acute* contaminant; that is, it can cause short term health impacts and even death when ingested above the legal limit. The most well-known health effect is “Blue Baby Syndrome” or methemoglobinemia. When afflicted with this illness, an infant’s system has a reduced oxygen carrying capacity of hemoglobin. This illness can be fatal. Other short term health effects are spontaneous abortions, stillbirths or Sudden Infant Death Syndrome.

Radionuclides

Radionuclides are a class of particles that emit radiation as they decay to a more stable configuration. Uranium is perhaps the most common and is regulated on its own, but because the process of decay produces several different elements, they are measured based on total radioactivity (gross alpha) rather on concentration (the amount of each element in water). Most radioactivity is naturally occurring in rocks and soils, but can also enter the environment through the production and use of phosphate fertilizers, or from mining or industrial facilities. Health effects of short term exposure include nausea, fatigue, and vomiting. External exposure (external to the body) is of far less concern than internal exposure, because alpha particles lack the energy to penetrate the outer dead layer of skin. Alpha particles are relatively heavy and can easily be



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stopped by walls, clothes, or even skin. However, exposure can occur through inhalation (for instance, in the shower) or ingestion (through drinking water or eating food prepared with that water).

Additional sources of information on health effects of contaminants in drinking water:

- US EPA Office of Groundwater and Drinking Water, <http://www.epa.gov/safewater/>
- The Agency for Toxic Substances and Disease Registry (ATSDR): <http://www.atsdr.cdc.gov> has toxicological profiles for most drinking water contaminants
- In California, the Office of Environmental Health and Hazard Assessment evaluates the safe concentration of contaminants in drinking water; <http://oehha.ca.gov/water/phg/allphgs.html>