

OurwaterQuality

About total dissolved solids in water

The term “total dissolved solids” represents the sum of the dissolved inorganic salts and organic matter dissolved in water in molecular, ionized or colloidal form. Gases and fine sediment are not included. TDS includes both positively charged ions (or cations, such as calcium, magnesium, potassium, and sodium) and negatively charged ions (or anions, including bicarbonate, chloride, and sulfate). TDS is a qualitative measurement of the amount of dissolved ions, but does not itself indicate the relationship of the ions or the absolute amounts of individual ions.

The electrical conductivity of water increases as a function of TDS. High-purity water containing only H₂O without salts or minerals has a very low electrical conductivity. A portable TDS meter measures the electrical conductivity of the water and then the meter’s microprocessor converts that reading to TDS in parts per million (ppm) or the equivalent milligrams per liter (mg/L).

Total dissolved solids falls under the EPA’s Secondary Standards, which are non-enforceable guidelines for aesthetic considerations. The limit set by the EPA is 500 mg/L.

According to the Water Quality Association classification, TDS values are as follows: freshwater - below 1,000 ppm (or mg/L); brackish water - 1,000 to 15,000 ppm; saline water - 15,000 to 30,000 ppm; sea water - 30,000 to 40,000 ppm; and brine - above 40,000 ppm. (“Sea water” is highly variable globally, depending on river input and evapotranspiration.)

Water from the city’s Sangre de Cristo Water Division varies with geographic location. It has TDS values widely ranging from 100-450 ppm, depending on whether the predominant source of the water is reservoir water (lower TDS) or aquifer water (higher TDS). During the recent Santa Fe Water Fair, in which 475 private, domestic wells were sampled, TDS values ranged from 108 to 7,624 ppm, with a mean value of 504 ppm.



STEPHEN WIMAN

So what are the health implications of TDS? An elevated TDS concentration is not itself a health hazard but rather a general and indirect indication of water quality. TDS concentration is regulated because it is more of an aesthetic than a health hazard. However, water high in TDS may also contain elevated levels of regulated Primary Drinking Water Standard constituents that pose potential human health risks; these include arsenic, copper, fluoride, lead, nitrate, and radionuclides. TDS is of particular concern on private wells, where there is no enforcement of standards and the owner is responsible for water quality. Elevated TDS values also may indicate that the water may be corrosive, have an unpleasant taste, result in scale formation, and possibly decrease the efficiency of water heaters and household appliances.

The ideal TDS for drinking water is a matter of personal opinion and you can make that choice in your home. Some consider water with TDS less than 50 mg/L to be ideal, but these levels are achieved only through distillation, deionization, or reverse osmosis. Consumers on municipal systems drink water with TDS as high as a few hundred mg/L, which is usually tolerable if the chlorine is removed; while others pay premium prices for imported bottled water with high TDS - for example 475 mg/L for Perrier and 1,109 mg/L for San Pellegrino. It’s your choice.

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