



INTERPRETING DRINKING WATER ANALYSIS

FACT SHEET

Total coliform bacteria, nitrate, pH, hardness and total dissolved solids all affect water quality. Though other contaminants can be analyzed, testing for them can often be expensive and unnecessary. It is more important to test on a regular basis for a few indicators of contamination and to maintain good records.

An explanation of the terms often appearing on water analysis reports are shown in this Fact Sheet. Tables showing the EPA Maximum Contaminant Levels (MCL) and Secondary Drinking Water Regulations (SDWR) for some of the analytes are on the back of this sheet. MCLs are the highest level of a contaminant allowed in drinking water. SDWRs are non-enforceable Federal guidelines regarding cosmetic or aesthetic effects.

TOTAL COLIFORM

This is a bacteriological analysis which indicates if a water supply has been contaminated with human or animal waste. If the result of this test is positive, the water should not be used for human consumption unless it is boiled for five minutes or disinfected by other means.

pH

A pH of less than 6.5 can cause health problems. Municipal water supplies are usually adjusted to values between 8.0 and 10.0. Highly acidic water can be corrosive and may dissolve metals from pipes, pumps, and other fixtures. SDWR standards suggest a pH range between 6.5 to 8.5 for drinking water.

HARDNESS

Water containing excessive levels of calcium and magnesium is said to be "hard". Hard water does not affect health but can cause scaly deposits to form in pipes and water tanks.

HARDNESS RATINGS*	(mg/l)	(grains/gallon)
Soft	< 50	< 2.9
Moderately Soft	50 - 150	2.9 - 8.8
Hard	150 - 300	8.8 - 17.5
Very Hard	> 300	> 17.5

* "Handbook of Drinking Water Quality", Van Nostrand Reinhold Publishing, 1990

It is desirable that water tests below 150 mg/l hardness and not higher than 500 mg/l.

ELECTRICAL CONDUCTIVITY AND TOTAL DISSOLVED SOLIDS

Electrical conductivity (EC) measures the soluble salt concentration in mmhos/cm and is used to calculate the total dissolved solids (TDS) in water supplies. The EC should not exceed 0.78. Water containing more than 500 mg/l total dissolved solids is not recommended for human consumption.

NITRATE

A high concentration of nitrate can be fatal to infants and a threat to young farm animals. High levels may occur near manure piles, fertilized fields, or subdivisions using septic tanks. Levels should not exceed 10 mg/l Nitrate (as N) or 1 mg/l Nitrite (as N).

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MAXIMUM CONTAMINANT LEVELS			
Arsenic (As)	10 ug/l	Flouride (F)	4 mg/l
Cadmium (Cd)	5 ug/l	Lead (Pb)	15 ug/l
Copper (Cu)	1300 ug/l	Mercury (Hg)	2 ug/l

SECONDARY DRINKING WATER REGULATION LEVELS			
Chloride (Cl)	250 mg/l	Sulfate (SO ₄)	250 mg/l
Iron (Fe)**	0.30 mg/L	Zinc (Zn)	5 mg/l
Manganese (Mn)**	0.05 mg/l		

** Iron and Manganese are often present together. They may cause rusty water, stains, deposits and affect water's taste, but are not a health hazard.

WATER TREATMENT METHODS

- Absorption Filter:* Reduces poor taste, bad odor, turbidity, chloride, radon, organic contaminants, iron, arsenic.
- Reverse Osmosis:* Reduces dissolved inorganic and some organic contaminants. Reduces various cations (i.e. lead, chromium, and cadmium).
- Ion Exchange:* Reduces calcium, magnesium, barium, nitrate, fluoride and other mineral levels.
- Distillation:* Removes all but volatile contaminants. Inactivates or removes pathogens.
- Water Softener :* Reduces hardness and may remove manganese and small amounts of iron.
- Chlorination:* Removes iron, manganese and any iron or manganese related bacteria. It is more effective in removing iron in dissolved or precipitated forms if it is followed by filtration.

SAMPLE COLLECTION

Drinking Suitability

Locate a sampling point near the well, before the water softener. Turn on the water and allow it to run long enough to flush the system out with water. If a coliform test is required, turn off the water and pass a flame back and forth over the outlet to sterilize. Turn on the water at a moderate flow rate. Carefully fill a sterile container and reattach the lid. If other drinking suitability tests are required, fill a second container from the running faucet and seal the lid. Samples should be refrigerated after collection and transported to the lab within 24 hours.

Lead and Copper

Sample at the kitchen faucet or wherever most drinking water is taken from. The sample should be collected the first thing in the morning, before anyone has drawn water. Fill the 1 pint container directly from the faucet without allowing the water to run first. If any of the above tests are being run, a separate sample should be taken for lead and/or copper.

ABBREVIATIONS, CONVERSIONS AND EQUIVALENTS

mg/l	= milligrams per liter	ug/l	= micrograms per liter
Mmho/cm	= unit of conductance	EC	= electrical conductance
>	= more than	<	= less than
SO ₄ ⁻ S	= SO ₄ ⁻ x 0.333	NO ₃ ⁻ -N	= NO ₃ ⁻ x 0.226
TNTC	= too numerous to count	17.1 mg/l	= 1.0 grain/gallon