Common Water Quality Tests

Water Test	MCL	Source of Contaminant	Health Effects	Treatment Options
Coliform/e-coli	pass/fail	Coliform is one of the most common bacteria and is used as an indicator of other potential bacteriological contamination. Is found on skin and can be introduced into the water system when filters are replaced. E. coli occurs in untreated sewage or surface runoff.	Most types of coliform are harmless but some (e. coli) can cause mild illnesses or waterborne diseases. Symptoms include fever, abdominal cramps, and diarrhea (general flu-like symptoms).	Total coliform - disinfect water system with chlorine. E. coli – disinfect water system and investigate potential sources.
Nitrates	10 ppm (mg/L)	Decomposing organic matter or runoff from fertilizer, and may indicate failed or failing septic system or inadequate separation distance. Also occurs naturally from pre-historic organic matter.	Binds with oxygen in the blood and reduces available oxygen in the bloodstream. Particularly effects pregnant women and infants (blue baby syndrome).	Reverse osmosis and ion exchange (depends on levels). Not readily removed by filtration.
Arsenic	10 ppb (µg/L)	Dissolution of minerals and ores high in arsenic (arsenopyrite). Common in the schist hills around Fairbanks and near gold deposits.	Long-term exposure through drinking water increases risk of cancer of the skin, lungs, urinary bladder, and kidney. Absorption through skin is minimal and thus hand-washing, bathing, and doing laundry with water containing arsenic do not pose human health risk.	Reverse osmosis, nano filtration, special arsenic filters (activated aluminum).
Langelier's Index	ranges from -5.0 (highly corrosive) to +5.0 (severe scale forming), 0 is balanced.	A value calculated from other water components (calcium, bicarbonate, total dissolved solids, pH, and alkalinity) used to evaluate potential for water to be corrosive or scale forming.	Corrosive water has a tendency to leach metals from water pipes, holding tanks, and solders. Corrosion results in pipe damage, stained laundry, bitter tasting water and harmful levels of metals such as lead and copper introduced into drinking water. Scaling water will plug up filters and screens with calcium deposits and can reduce water flow and give water a bitter taste.	Ion exchange (water softener). Note: low pH, high water temperature, and presence of suspended solids can accelerate corrosion.
Alkalinity	none	Capacity of water to neutralize an acid. Helps determine the corrosivity of water.	Not considered toxic but affects the palatability of drinking water	
pH	ranges from 0 (acidic) to 14 (basic), 7 is neutral.	Measures the intensity of alkalinity or acidity in the water. Helps determine the corrosivity of water.	Not considered toxic but affects the palatability of drinking water. Ideal pH level of drinking water is between 6 – 8.5.	

Common Water Quality Tests

Water Test	MCL	Source of Contaminant	Health Effects	Treatment Options
Copper	1000 ppb (µg/L)	Naturally occurring but usually results from the corrosion of copper pipes.	No evidence that copper causes disease in humans but at elevated levels, it is considered an irritant and may cause stomach cramps and intestinal illnesses.	Replacement of plumbing system components (expensive) , acid neutralizing filers using calcium carbonate, chemical feed pump using sodium hydroxide, user actions (see below)
Lead	15 ppb (µg/L)	Rarely found in source water. Usually results from corrosion of lead pipes and lead solders (commonly used prior to 1991).	Severe health risks. Children may have developmental problems. Adults can experience increased in blood pressure, kidney and fertility problems.	Replacement of plumbing system components, reverse osmosis, activated carbon filtration, user actions (see below)
Iron	300 ppb (µg/L)	Originates in soils surrounding the well.	Not considered toxic but affects the appearance and palatability of drinking water (“rusty water”, metallic taste, stained clothing and fixtures).	Ion exchange (water softeners) or iron filter with greensand media and potassium permanganate.
Manganese	50 ppb (µg/L)	Originates in soils surrounding the well.	Not considered toxic but does affect the appearance and palatability of water (black “flecks” and an “off-taste”)	Ion exchange (water softeners) or iron filter (as described above)
Hardness	ranges from less than 17 mg/L (soft) to greater than 180 mg/L (very hard)	Refers to level of dissolved minerals in the water. The source is elevated levels of calcium, magnesium and other similar substances in the soils around the well.	Not considered toxic but affects the palatability of drinking water. Hard water reduces the effectiveness of soap. Excessively soft water feels “slippery” on the skin.	Ion exchange (water softeners). Exchanges sodium ions for calcium ions in water.
Total Dissolved Solids (TDS)	500 mg/L	Refers to the total amount of substances dissolved in water such as sodium chloride.	May indicate the presence of other water quality problems.	Ion exchange (water softeners).
Sodium	none	Ion exchange (water softeners) using salt.	High sodium may be harmful to persons on a sodium-restricted diet.	Removal of water softener.
Sulfolane	25 ppb ug/l	Flint Hills refinery groundwater. Used as a stripping agent in fuel production. The plume appears to be traveling with the ground water flow to the northwest of the Refinery in North Pole.	Health effects are largely unknown due to lack of long-term testing, which has only been done in China and Canada. More research is currently underway.	Absorption through the use of granular activated carbon (GAC) filters.

Common Water Quality Tests

Resources:

http://www.freedrinkingwater.com (follow links to “Learn the Truth About Our Water” and “Contaminants List & Their Health Effects”)

http://water.epa.gov/drink/contaminants/ (includes a long list of contaminants, health effects, and regulations)

http://www.water-research.net/ (has some good information on water quality, educational resource for other water related information)

http://www.nsf.org/ (provides standards and certifications concerned with health and safety.)

http://www.nsf.org/business/water_distribution/index.asp?program=WaterDistributionSys (Drinking water standards/certifications included under NSF/ANSI 60 and 61)

Common Water Quality Tests

Lead and Copper: Minimizing Your Exposure

Flush Your Pipes Before Drinking
Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until it becomes as cold as it will get. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.) The more time water has been sitting in your home's pipes, the more lead it may contain.

Only Use Cold Water for Consumption
Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels of lead. The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

Once you have flushed a tap, you might fill one or more bottles with water and put them in the refrigerator for later use that day. (The water that was flushed - usually one to two gallons - can be used for non-consumption purposes such as washing dishes or clothes; it needn't be wasted.)

Health Threats From Lead

Too much lead in the human body can cause serious damage to the brain, kidneys, nervous system, and red blood cells.

You have the greatest risk, even with short term exposure, if:

- you are a **young child**, or
- you are **pregnant**.

Sources of Lead in Drinking Water

Lead levels in your drinking water are likely to be highest if:

- your home has **faucets or fittings of brass** which contains some lead, or
- your home or water system has **lead pipes**, or
- your home has **copper pipes with solder**, and
    - the house is less than five years old, or
    - you have naturally soft water, or
    - water often sits in the pipes for several hours.