

## Understanding Your Test Results

**Example Test Result**

### LABORATORY ANALYTICAL REPORT

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
<b>INORGANICS</b>							
Alkalinity, Total as CaCO <sub>3</sub>	254	mg/L		1		A2320 B	03/21/06 17:40 / qed
Chloride	27	mg/L		1		E300.0	03/22/06 19:13 / qed
Sulfate	318	mg/L		1		E300.0	03/22/06 19:13 / qed
Fluoride	1.0	mg/L		0.1		E300.0	03/22/06 19:13 / qed
Nitrogen, Nitrate+Nitrite as N	0.24	mg/L		0.05		E300.0	03/22/06 19:13 / qed

The following interpretation is based on public drinking water system standards. These standards only apply to public water systems but the health implications are the same for private well water users.

#### Definitions:

**ND** stands for no detection meaning the parameter was not detected in the sample  
**ppm** (parts per million) is often used interchangeably with **mg/L** (milligrams per liter)  
**RL** (reporting limit) is basically the smallest concentration a test can detect  
**MCL** (maximum contaminant level) is a USEPA drinking water standard

Parameter Name	Possible Results	Quick Interp.	Warnings and Suggestions
<b>Alkalinity (Total as CaCO<sub>3</sub>)</b>  The ability of water to compensate for changes in pH. Higher alkalinity means water is less likely to experience big changes in acidity.	ND or less than 100 (mg/L)	Corrosion Potential	As alkalinity decreases below 100, if pH is lower than 6.5 there is increased potential for corrosion of pipes releasing metals into the water .
	100 to 200 (mg/L)	Satisfactory	Sufficient buffer potential to resist changes in pH and generally not significant scaling in pipes.
	200 or more (mg/L)	Scaling Potential	Possible scaling in pipes and water heaters.
<b>Aluminum</b>  A naturally occurring metal generally found in concentrations between 0.01 and 0.3 mg/L in groundwater. The EPA secondary standard for aluminum is 0.050 to 0.2 mg/L because high concentrations can cause coloring of water.	ND or less than 0.05 (mg/L)	Satisfactory	No action necessary.
	0.05 or more (mg/L)	Objectionable	Standard based on aesthetics not health; if water discoloration is troublesome, consider treatment.
<b>Antimony</b>  Antimony is not commonly found in nature; sources of contamination include petroleum refinery discharge, fire retardants, ceramics, electronics and solder.	ND or less than 0.006 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.005 or more.
	0.006 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information
<b>Arsenic</b>  Groundwater contamination can happen from mining, pesticides and wood preservatives; contamination can also occur naturally.	ND	Satisfactory	Retesting not necessary unless a change is suspected.
	0 to 0.010 (mg/L)	Satisfactory	Ideally, drinking water should contain no detectable arsenic; consider retesting next year if result is 0.008 mg/L or more.
	0.010 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative drinking water sources; see fact sheet for more information.

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<p><b><u>Barium</u></b></p> <p>Found abundantly in nature and is used in the production of many household items; it can enter drinking water through industrial discharge and natural erosion.</p>	ND or less than 2 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 1.6 mg/L or more.
	2 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative drinking water sources; see fact sheet for more information.
<p><b><u>Beryllium</u></b></p> <p>A naturally occurring metal used in metal refining; coal combustion; and electrical, aerospace and defense industries.</p>	ND or less than 0.004 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.003 mg/L or more.
	0.004 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b>Bicarbonate as HCO<sub>3</sub></b></p> <p>Bicarbonate is the principle alkaline constituent in drinking water. See alkalinity.</p>	Any Value	Satisfactory (depending on alkalinity)	Bicarbonate does not pose a health risk; bicarbonate and carbonate are closely related to alkalinity.
<p><b><u>Cadmium</u></b></p> <p>A metallic element that can enter drinking water through corrosion of pipes, erosion of natural deposits, metal refining and runoff from waste batteries and paints.</p>	ND or less than 0.005 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.004 mg/L or more.
	0.005 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b>Calcium</b></p> <p>A naturally occurring metal essential in the human diet and common in groundwater with concentrations ranging from zero up to several hundred mg/L. A major contributor to the hardness of water which can cause scaling problems in pipes and hot water heaters.</p>	Any Value	Satisfactory (depending on hardness)	Calcium does not pose a health risk; calcium and magnesium together make up the hardness; see hardness.
<p><b>Carbonate as CO<sub>3</sub></b></p> <p>Mineral found in groundwater. See alkalinity.</p>	Any Value	Satisfactory (depending on alkalinity)	Carbonate does not pose a health risk; carbonate and bicarbonate are closely related to alkalinity; see alkalinity.
<p><b>Chloride</b></p> <p>A common natural salt in groundwater. The EPA secondary standard for chloride is 250 mg/L; higher concentrations can cause a salty taste.</p>	ND or less than 250 (mg/L)	Satisfactory	No action necessary.
	250 or more (mg/L)	Objectionable	Standard based on aesthetics not health; if salty taste is troublesome, consider treatment.

Parameter Name	Possible Results	Quick Interp.	Warnings and Suggestions
<p><b><u>Chromium</u></b></p> <p>A metallic element commonly found in nature; contamination of ground water can happen through discharge from leather tanning, steel and pulp mills or erosion of natural deposits.</p>	ND or less than 0.10 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.08 mg/L or more.
	0.10 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b>Coliform Bacteria (Total)</b></p> <p>A type of bacteria which should not be present in groundwater; indicates potential contamination.</p>	Absent	Satisfactory	Continue testing annually to monitor for contamination.
	Present	Objectionable	No direct health threat, but coliforms should not be present in groundwater; see fact sheet for more information.
<p><b><u>Coliform Bacteria (E. coli)</u></b></p> <p>A type of bacteria found in feces of warm blooded animals which indicates fecal pollution. If <i>E. coli</i> is present in a sample, the water is unsafe to drink without treatment.</p>	Absent	Satisfactory	Continue testing annually to monitor for contamination.
	Present	Unsatisfactory	Direct health threat; treat water for drinking and cooking; see fact sheet for more information.
<p><b>Conductivity</b></p> <p>A measure of how easily electric current will pass through a water sample. This measurement is related to and often used to estimate total dissolved solids. Also used to estimate the tendency of water to corrode metal.</p>	Any Value	Satisfactory	Conductivity does not pose a health risk; it is related to total dissolved solids and is used in calculating the corrosivity.
<p><b>Corrosivity (Langelier Index)</b></p> <p>Corrosive water can mobilize metals (especially lead and copper) from pipes into drinking water and can eventually cause leaks in plumbing. While not a perfect tool, the Langelier Index is a useful guide for assessing the corrosive ability of water.</p>	Less than -2.5	High Corrosion Potential	Corrosive water can leach metals from minerals in the earth or from pipes and fixtures; treatment and/or testing for metals is recommended.
	-2.5 to -0.5	Moderate Corrosion Potential	Corrosive water can leach metals from minerals in the earth or from pipes and fixtures; Consider treatment and/or testing for metals.
	-0.5 to 0.5	Satisfactory	Ideal range to minimize corrosion and scaling.
	0.5 to 2.5	Moderate Scaling Potential	Moderate potential for scaling in pipes and hot water heaters; consider treatment.
	More than 2.5	High Scaling Potential	High potential for scaling in pipes and hot water heaters; consider treatment.
<p><b><u>Copper</u></b></p> <p>Potential health risks; copper is a metallic element that is rarely found in groundwater, but can be introduced into drinking water by corrosion of pipes.</p>	ND or less than 1.3 (mg/L)	Satisfactory	Pipe corrosion is a common copper source; if water is corrosive, copper concentration could change through time; consider retesting next year if result is 1.0 mg/L or more. See fact sheet for more information.
	1.3 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative drinking water sources; see fact sheet for more information.

Parameter Name	Possible Results	Quick Interp.	Warnings and Suggestions
<p align="center"><b>Fluoride</b></p> <p>A naturally occurring nonmetal which promotes dental health at concentrations between 0.7 and 1.5 mg/L, but can cause health problems at high concentrations.</p>	<b>ND or less than 0.7 (mg/L)</b>	<b>Satisfactory</b>	Concentrations below 0.7 mg/L are out of the ideal range for protection of tooth enamel.
	<b>0.7 to 1.5 (mg/L)</b>	<b>Satisfactory</b>	Ideal range for development and protection of tooth enamel.
	<b>1.5 to 2.0 (mg/L)</b>	<b>Satisfactory</b>	Concentrations above 1.5 mg/L are out of the ideal range for protection of tooth enamel.
	<b>2.0 to 4.0 (mg/L)</b>	<b>Objectionable</b>	Dental fluorosis or brownish discoloration of teeth can occur; a report by the National Research Council suggests possible health effects at concentrations in this range.
	<b>4.0 or more (mg/L)</b>	<b>Unsatisfactory</b>	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p align="center"><b>Hardness (as CaCO<sub>3</sub>)</b></p> <p>Primarily caused by compounds of calcium and magnesium in water and can result in scaling in pipes/water heaters; it also decreases the lather and effectiveness of soaps and detergents.</p>	<b>ND or less than 60 (mg/L)</b>	<b>Corrosion Potential</b>	Softer water can be more corrosive; see corrosivity.
	<b>61 to 120 (mg/L)</b>	<b>Satisfactory</b>	Generally a satisfactory intermediate between corrosion and scaling; see corrosivity.
	<b>121 or more (mg/L)</b>	<b>Scaling Potential</b>	Harder water can cause scaling in pipes and hot water heaters; if scaling is troublesome, consider softening.
<p align="center"><b>Iron (Total)</b></p> <p>Iron is a metallic element found in nature. Aesthetic problems such as staining of clothes and pipes, as well as sediment problems in plumbing are associated with iron.</p>	<b>ND or less than 0.3 (mg/L)</b>	<b>Satisfactory</b>	No action is necessary
	<b>0.3 or more (mg/L)</b>	<b>Objectionable</b>	High iron can cause discoloration of fixtures and/or clothing and can support iron bacteria growth leading to taste and odor problems; if troublesome, consider treatment.
<p align="center"><b>Lead</b></p> <p>A metallic element that often enters drinking water through corrosion of pipes.</p>	<b>ND</b>	<b>Satisfactory</b>	If water is corrosive, lead concentration could change through time; see corrosivity.
	<b>0 to 0.015 (mg/L)</b>	<b>Satisfactory</b>	Pipe corrosion is a common lead source; if water is corrosive, lead concentration could increase; consider retesting next year if result is 0.012 mg/L or more; see fact sheet for more information.
	<b>0.015 or more (mg/L)</b>	<b>Unsatisfactory</b>	Health risk exists; consider water treatment and/or alternative drinking water sources; see fact sheet for more information.
<p align="center"><b>Magnesium</b></p> <p>A naturally occurring metal important in human diet and common in groundwater; with calcium, magnesium is a major contributor to the hardness of water.</p>	<b>Any Value</b>	<b>Satisfactory (depending on hardness)</b>	Magnesium does not pose a health risk; calcium and magnesium together make up the hardness; hard water can cause scaling in pipes; see hardness.
<p align="center"><b>Manganese</b></p> <p>A naturally occurring metal important in the human diet, but health risks at high concentrations; the EPA secondary standard for manganese is 0.05 mg/L; high concentrations can cause black to brown color, black staining, and a bitter taste.</p>	<b>ND or less than 0.05 (mg/L)</b>	<b>Satisfactory</b>	No action necessary.
	<b>0.10 or more (mg/L)</b>	<b>Unsatisfactory</b>	Health risk exists; consider water treatment and/or alternative sources, especially if children are drinking the water; see fact sheet for more information. Aesthetic black or brown staining and metallic taste can occur at concentrations > 0.05 mg/L.

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<p><b><u>Mercury</u></b></p> <p>A metallic element; sources of contamination of drinking water include erosion of natural deposits, discharge from refineries and factories and runoff from landfills and croplands.</p>	ND or less than 0.002 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.0016 mg/L or more.
	0.002 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b><u>Nitrate + Nitrite as N or Nitrate as N</u></b></p> <p>Can occur naturally, from septic tanks/wastewater treatment, or from agricultural practices and causes oxygen deficiency in infants under 6 months of age; nitrate moves easily in groundwater so increasing nitrate levels can be an early warning that other contaminants are moving toward a well.</p>	ND or less than 1 (mg/L)	Satisfactory	Continue testing annually to monitor for contamination.
	1 to 4 (mg/L)	Possible Impairment	Potential pollution exists; continue testing annually to monitor for changes.
	4 to 10 (mg/L)	Above Normal Natural Levels	Above normal levels; possible contamination; continue monitoring annually for changes; Monitor more regularly if infants under the age of 1 year are consuming the water.
	10 or more (mg/L)	Unsatisfactory	Health risk exists, discontinue use of water for infants under 1 year of age and persons with cardiovascular conditions; see fact sheet for more information.
<p><b>pH</b></p> <p>The measure of acidity of water; pH is related to the ability of water to corrode pipes and release metals into water.</p>	6.5 to 8.5	Satisfactory	pH of groundwater does not generally change rapidly so retesting is not necessary unless a change is suspected.
	Less than 6.5 or More than 8.5	Objectionable	pH slightly out of the ideal range is not a direct health threat but can affect corrosivity which can leach metals from minerals in the earth or from pipes; consider a corrosivity test.
<p><b>Potassium</b></p> <p>A common salt in groundwater essential in the human diet; concentrations are typically less than 10 mg/L.</p>	Any Value	Satisfactory	Tap water concentrations generally range from 0.5 to 8 mg/l; no action is necessary.
<p><b><u>Selenium</u></b></p> <p>A non-metallic element found in sedimentary rocks; sources of contamination include: discharge from petroleum refineries, erosion of natural deposits, and discharge from mines.</p>	ND or less than 0.05 (mg/L)	Satisfactory	Result generally shouldn't change dramatically through time, consider retesting next year if result is 0.04 mg/L or more.
	0.05 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b>Sodium</b></p> <p>A common salt in groundwater which can impart a salty taste at concentrations over 250 mg/L; sodium can contribute to hypertension and high levels in drinking water should be noted by people on low sodium diets.</p>	Any Value	Satisfactory	Sodium in drinking water supplies can range from 0.4 to 1,900 mg/l; sodium intake in drinking water should be considered by people on low sodium diets in association with reducing risk of cardiovascular disease.



Parameter Name	Possible Results	Quick Interp.	Warnings and Suggestions
<p><b>Sodium Adsorption Ratio (SAR)</b></p> <p>SAR is the amount of sodium relative to calcium and magnesium in the water; high SAR can damage soil and reduce crop productivity.</p>	Any Value	Depends on conductivity and soil type	SAR is not relevant for drinking water, but irrigation water with an SAR value above 6 can pose a risk to physical soil characteristics; SAR risk is evaluated based on its relationship to conductivity and the texture of the soil being irrigated; see fact sheet for more information.
<p><b>Sulfate</b></p> <p>A common salt in groundwater which can impart a salty taste; high quantities can cause gastrointestinal distress in people unaccustomed to the water.</p>	ND or less than 250 (mg/L)	Satisfactory	No action necessary.
	250 or more (mg/L)	Objectionable	Standard based on aesthetics not health; if salty taste is troublesome, consider treatment.
<p><b>Thallium</b></p> <p>A metallic element; sources of contamination include: leaching from ore-processing sites, discharge from electronics, glass and drug factories.</p>	ND (mg/L)	Satisfactory	No action necessary.
	0.001 to 0.002 (mg/L)	Satisfactory	Ideally, drinking water should contain less than 0.001 mg/l of thallium; consider retesting next year if result is 0.001 mg/L.
	0.002 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment and/or alternative sources; see fact sheet for more information.
<p><b>Total Dissolved Solids</b></p> <p>TDS is the sum of all minerals, metals and salts dissolved in water; high quantities can cause gastrointestinal distress in people unaccustomed to the water.</p>	ND or less than 500 (mg/L)	Satisfactory	Total Dissolved Solids should not change significantly through time; retest if a change is suspected.
	500 or more (mg/L)	Objectionable	High total dissolved solids do not generally pose a serious health risk but can cause water to be colored, taste poor, stain, and cause diarrhea in people not accustomed to the water.
<p><b>Uranium</b></p> <p>A naturally occurring metal that can be ingested through the air, water and plants. The EPA primary standard is 30 µg/L. Water can be contaminated from natural processes, mining, coal combustion, nuclear power plants and phosphate fertilizers.</p>	ND or less than 0.030 (mg/L)	Satisfactory	Ideally, drinking water should not contain any uranium.; consider retesting next year if value is greater than 0.024 mg/L.
	0.030 or more (mg/L)	Unsatisfactory	Health risk exists; consider water treatment or alternative drinking water sources; see fact sheet for more information.
<p><b>Zinc</b></p> <p>A naturally occurring metal essential to the human diet; the EPA secondary standard for zinc is 5 mg/L; high concentrations can cause a metallic taste.</p>	ND or less than 5 (mg/L)	Satisfactory	No action necessary.
	5 or more (mg/L)	Objectionable	Standard based on aesthetics not health; if metallic taste is troublesome; consider treatment.