

Corrosion and Toxic Metals Kit

Generally speaking, corrosive water may come from electrical grounding or plumbing that connects dissimilar metals such as galvanized iron and copper. Water is characterized as corrosive when pH and alkalinity values are at somewhat lower levels than those considered to be “stable”. This combination of lowered pH and alkalinity means that the water is not only somewhat acidic but is also lacking in mineral content.

Water with these characteristics will tend to corrode some of the materials that it comes into contact with. Corrosive or soft water leaches metals from piping, tanks, well casing and other metal surfaces that it comes in contact with. Corrosion of toxic materials such as lead and copper can create serious health effects in humans.

There are no regulations in many states that require the users of private wells or springs to test or treat their water for corrosion or toxic metals. It is your responsibility to monitor the safety of your water.

Langlier (or Corrosion) Index Kit

Parameter	Analytical Method	Individual Test Price	Kit Price
pH	SM 4500- H-B	\$15.00	
Alkalinity	SM 2320B	\$22.00	
Calcium Hardness	SM 2340B	\$25.00	
Total Dissolved Solids	SM 2540C	\$24.00	
Langlier Index*	Calculation	\$10.00	\$86.00

*Langlier Index of zero indicates that the water is “balanced” and is less likely to have the potential for corrosion.

Common toxic metals can exist in well waters naturally or from the leaching of corroded pipes.

Toxic Metals Kit

Parameter	Analytical Method	Individual Test Price	Kit Price
Arsenic	EPA 200.8	\$30.00	
Cadmium	EPA 200.8	\$30.00	
Chromium	EPA 200.8	\$30.00	
Copper	EPA 200.8	\$30.00	
Lead	EPA 200.8	\$30.00	
Zinc	EPA 200.8	\$30.00	
			\$120.00

Lead, Copper, and Zinc Kit

Parameter	Analytical Method	Individual Test Price	Kit Price
Copper	EPA 200.8	\$30.00	
Lead	EPA 200.8	\$30.00	\$53.00 (Lead & Copper)
Zinc	EPA 200.8	\$30.00	\$70.00 (Lead, Copper & Zinc)

Adding a caustic compound such as sodium hydroxide can be used to treat soft water. This will cause the sodium concentration of the water to be increased. **Therefore, individuals on a low sodium diet need to make their doctors aware of any treatment system.**

Sodium Chloride (Salt) Kit

Parameter	Source	Analytical Method	Individual Test Price	Kit Price
Sodium	Water Treatment	EPA 200.7	\$20.00	
Chloride	Water Treatment	EPA 300.0	\$30.00	
				\$45.00

Minerals have both beneficial and harmful effects. Low doses are needed to maintain good health, while high doses may cause serious health issues.

Minerals and Anions Kit

Parameter	Source	Analytical Method	Individual test Price	Kit Price
Calcium	Background	EPA 200.7	\$20.00	
Magnesium	Background	EPA 200.7	\$20.00	
Iron	Background	EPA 200.7	\$20.00	
Sodium	Water Treatment	EPA 200.7	\$20.00	
Chloride	Water Treatment	EPA 300.0	\$30.00	
Sulfate	Background	EPA 300.0	\$30.00	
				\$110.00

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You may pick up sampling bottles and instructions at the lab, or arrange for us to ship bottles and instructions to you for a small fee.

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View the Health Effects of Common Toxic Metals Table below.

Health Effects of Common Toxic Metals

Parameter	MCL mg/L	Background	Health Effects
Arsenic	0.01	Arsenic occurs naturally in soil and minerals; common arsenic compounds can dissolve in water. Therefore, many residences have the potential for high levels of arsenic in their drinking water, particularly those on private wells, as a result of the geology of the area.	<p>Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea, vomiting, and decreased production of red and white blood cells.</p> <p>There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores.</p> <p>Cancer Effects: <i>Known to be a Human Carcinogen.</i></p>
Cadmium	0.005	All soils and rocks contain some cadmium. Environmentally available cadmium enters soil, water, and air from mining, industry, burning coal and household wastes.	<p>Long-term exposure to lower levels of cadmium in air, food, or water leads to a buildup of cadmium in the kidneys and which can lead to possible kidney disease. Other long-term effects are lung damage and brittle bones.</p> <p>The health effects in children are expected to be similar to the effects seen in adults.</p> <p>Cancer Effects: <i>Known to be a Human Carcinogen.</i></p>
Chromium	0.1	Chromium can be found in air and soil. Chromium does not usually remain in the atmosphere, but is deposited into the soil and water. It can easily change from one form to another in water and soil, depending on the conditions present.	<p>Chromium (III) is an essential nutrient that helps the body use sugar, protein, and fat.</p> <p>Some people are extremely sensitive to chromium (VI) or chromium (III). Allergic reactions consisting of severe redness and swelling of the skin have been noted.</p> <p>It is unknown if exposure to chromium will result in birth defects or other developmental effects in humans.</p> <p>Cancer Effects: <i>Known to be a Human Carcinogen.</i></p>
Copper	1.3	Copper is released from natural sources, such as volcanoes, windblown dusts, decaying vegetation, and forest fires. Drinking water may have high levels of copper if the residence has copper pipes and corrosive water.	<p>Everyone must absorb small amounts of copper every day because copper is essential for good health.</p> <p>However, ingesting high levels of copper can cause nausea, vomiting, and diarrhea. It can also cause damage to your liver and kidneys, and can even cause death. Studies in animals suggest that the young may experience more severe effects than adults, but it is not known if this would also be true in human children.</p>
Lead	0.015	Lead can be found in all parts of our environment. Much of it comes from human	Lead can affect almost every organ and system in your body. The most critical target for lead

		<p>activities.</p> <p>We may be exposed to lead by eating food or drinking water that has been contaminated through fallout from airborne dust and lead-based solders in copper plumbing.</p> <p>Exposure can also come from spending time in areas where lead-based paints have been used and are deteriorating.</p> <p>Eating lead-based paint chips or chewing on objects painted with lead-based paint or swallowing house dust or soil that contains lead can expose small children.</p>	<p>toxicity is the nervous system, both in adults and children.</p> <p>Long-term exposure to lead can result in decreased functions of the nervous system.</p> <p>Exposure to high lead levels can severely damage the brain and kidneys in adults and children and ultimately cause death. In pregnant women, high levels of lead may be transferred to the fetus and cause miscarriage. Harmful effects may also include premature births and smaller babies.</p> <p>Exposure to lead may cause decreased mental ability in the infant and learning difficulties and reduced growth in young children.</p>
Zinc	5.0	<p>Zinc is one of the most common elements in the earth's crust. It is found in air, soil, water, and is present in most foods. It builds up in fish and other animals, but it does not build up in plants.</p> <p>Zinc is present in contaminated drinking water that flows through galvanized pipes coated with zinc in order to resist rust.</p>	<p>Zinc is an essential element in our diet. Too little zinc can cause problems, but too much zinc is also harmful.</p> <p>Harmful effects generally begin at levels that are 10-15 times higher than the amount needed for good health. Large doses taken by mouth even for a short time can cause stomach cramps, nausea, and vomiting.</p>

EPA's Maximum Contaminant Level (MCL). MLCs are the maximum permissible level of a contaminant in water delivered to users of a public water system.

mg/L = milligrams per liter is equivalent to parts per million (ppm)

References:

1. Agency of Toxic Substances and Disease Registry:
<http://www.atsdr.cdc.gov/az/a.html>
2. Oregon Drinking Water Program:
<http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Pages/dwt.aspx>