OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

Private Water Well Analysis

If your drinking water comes from a household well, then you are on a private water supply. Federal and Oklahoma governments do not regulate privately-owned wells in Oklahoma; therefore, you , as the homeowner, are responsible for assuring your water is safe and of adequate quality for your needs. For this reason, routine testing for a few of the most common contaminants is highly recommended.

This fact sheet explains some of the testing that was performed on the water sample from your well or tap. The results should establish a baseline of the current quality of your drinking water. This guidance will assist you with interpreting the results from a Routine Chemical test panel that includes alkalinity, chloride, nitrate/nitrite, conductivity, pH, sulfate, total dissolved solids (TDS), and total hardness, or other individually-requested tests.

Note that the Routine Chemical panel does not include all of the Environmental Protection Agency (EPA) primary and secondary drinking water standard parameters.

Interpreting Your Results

Test results should be compared against the current EPA maximum contaminant levels (MCLs) and secondary standards (SMCLs) for the contaminant.

EPA has established MCLs for certain contaminants which, when present at excessive levels, may have an adverse effect on human health. MCL concentrations are the highest concentration of a contaminant allowed in drinking water.

Note that not all contaminants have MCLs.

EPA has also established National Secondary Drinking Water regulations that set non-mandatory and non-enforceable secondary water quality standards for some contaminants that can make the appearance, taste or odor of drinking water less pleasing to a consumer. SMCLs are established as guidelines to assist public water supply systems in managing their drinking water for aesthetic considerations. Secondary standard contaminants are not considered to present a risk to human health in concentrations at or below the SMCL.

Routine Chemical Tests	Contaminant	Maximum Contaminant Level
Primary Standards (MCL)	Nitrate (as N)	10 mg/L
	Nitrite (as N)	1 mg/L
Secondary Standards (SMCL)	Chloride	250 mg/L
	pH	6.5 to 8.5 SU
	Sulfate	250 mg/L
	Total Dissolved Solids (TDS)	500 mg/L

If your tests show a less-than symbol (<) followed by a value, the concentration of that contaminant in the sample is lower than the lowest concentration the lab can detect and report. In such cases, it means no significant concentration of the contaminant was detected in the sample.

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Total Alkalinity

Total alkalinity is a measure of the buffering capacity of water or its ability to resist sudden changes in pH. Comparing the alkalinity and the pH can provide an indication if your water exhibits tendencies of either corrosion or deposition.
See Calcium Carbonate Equilibrium for further information.

pH

pH can range from 0 to 14 standard units (SU) and is a measure of how acidic or basic water is. A pH of 0 would be extremely acidic and a pH of 14 would be very alkaline. A pH of 7 is considered neutral. The optimum range for pH in drinking water is between 6.5 to 8.5 SU.

Chloride

The recommended upper limit for chloride is 250 mg/L. Chloride is the greater part of table salt and may impart a salty taste to water.

Nitrate

The maximum allowable level for nitrate in a domestic well, a public water supply, or other primary source of drinking water is 10 mg/L. Nitrates are of particular concern to pregnant women and infants under six months old since drinking water high in nitrates may cause blue baby syndrome, methemoglobinemia. Nitrates are typically of little concern for adults or older children. Sources of nitrates include soil, sewage, and fertilizers.

Conductivity

Conductivity is typically reported in units of µmhos/cm, and is a measure of the ability of water to conduct an electrical current. Some level of conductivity is normal in well water. Conductivity increases with increasing amounts of certain ions such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium and iron. Elevated conductivity beyond usual baseline levels can be an indicator of water pollution. There is no EPA MCL for conductivity.

Total Dissolved Solids

The recommended upper limit for total dissolved solids is 500 mg/L. Water over that level should not be used if better quality water is available. Palatability of the water may be affected. Chloride, sulfate and alkalinity are primarily responsible for the dissolved solids content of water.

Sulfate

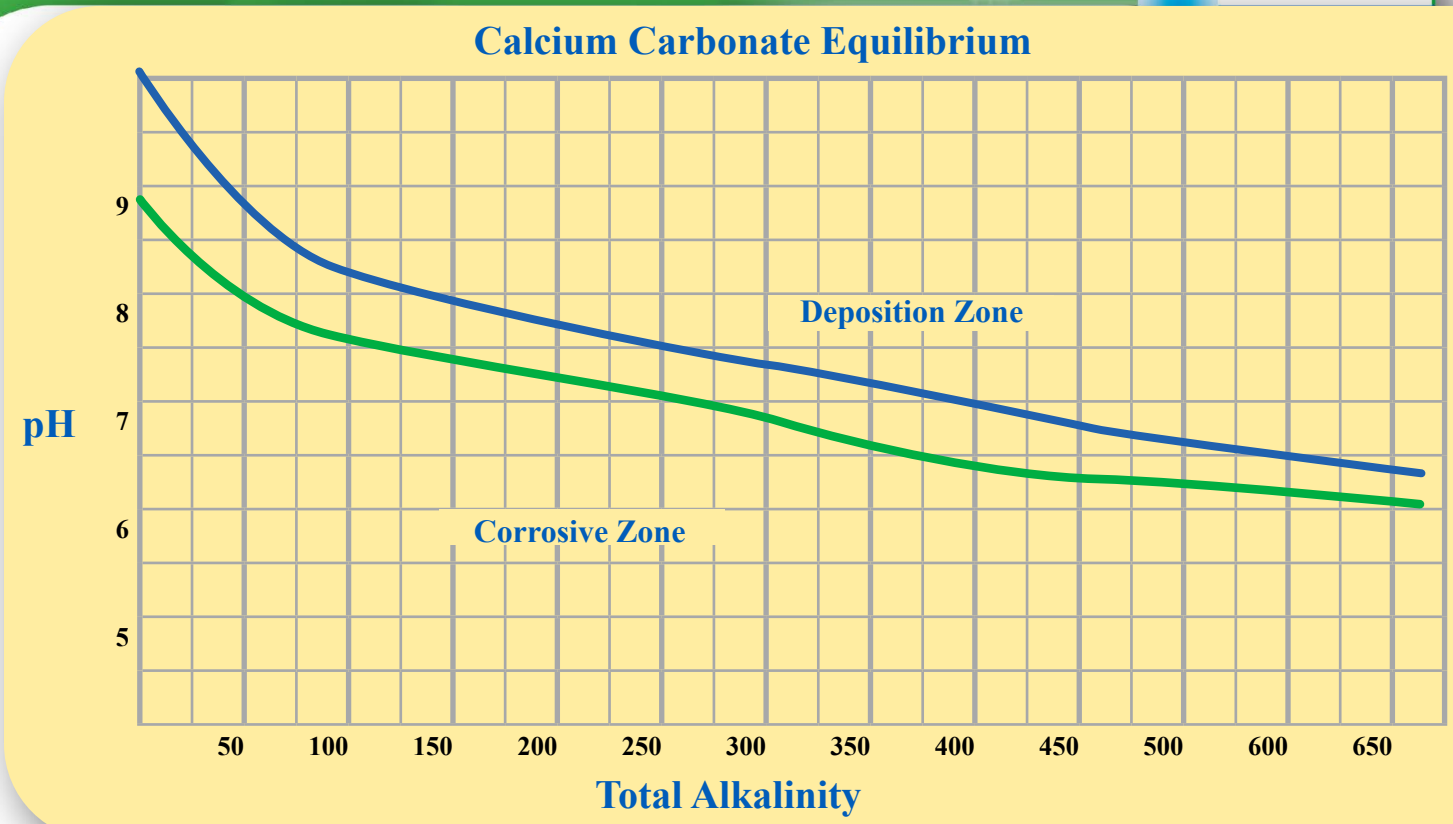
The recommended maximum for sulfate is 250 mg/L. Excessive concentrations of sulfate may act as a laxative to unaccustomed consumers. A bitter or gyp taste is often associated with high sulfate concentrations.

Hardness

Hardness is generally derived from contact of water with natural accumulations of salts in soil and geological formations, primarily limestone, dolomite and gypsum. It is reported as mg of calcium carbonate per liter (mg/L). Water hardness can be expressed in four ways:

- Soft – less than 75 mg/L
- Moderately Hard – between 75 and 150mg/L
- Hard – between 150 and 300 mg/L
- Very Hard – greater than 300 mg/L

Hard waters can still be as satisfactory for drinking as soft waters depending upon the tastes of the user. Excessive hardness may, however, cause laundering difficulties or produce scale build-up in hot water tanks, fixtures, and cooking utensils. When considering the type and effectiveness of a water softener it is important to know what form of hardness is present.



Calcium Carbonate Equilibrium

This table should be used to compare the pH of water to its total alkalinity to determine if the water is considered either corrosive or depositive. Water samples with a pH and alkalinity in the deposition zone are likely to result in calcium carbonate, or lime, precipitating out of the water and forming a protective coating inside the lines of a water distribution system. This coating is desirable up to a point, as it will help protect a metallic water line from corrosion. Excess deposition of calcium carbonate, however, can eventually clog a water line.

A water sample with a pH and alkalinity in the corrosive zone are likely to result in corrosion of metal service lines, tanks, and fixtures. This corrosive effect allows metals present in your water or lines and fixtures to dissolve into the water. If iron is present in your water, this may result in reddish-colored water and red staining of fixtures. These stains may cause the water to have a less appealing appearance but are not usually a danger to health. Corrosion can also cause additional metals, such as lead or copper, to dissolve into your water.

If you have additional concerns or questions, or if you are experiencing other problems which you feel may affect your water, contact the DEQ's State Environmental Laboratory at (405) 702-1000 or (866) 412-3057, or **email selsd@deq.ok.gov**, to discuss your needs and testing options, and to coordinate additional well water testing.

Additional Information

Visit our webpage at http://www.deq.state.ok.us/csdnew/index.htm for additional information.

- Home Water Testing FAQ has additional information about private wells, well testing, recommended tests, and private water treatment options.
- State Environmental Laboratory Analytical Fee Schedule contains current pricing for analytical services.