



Chandler Analytical Laboratories

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“Understanding Your Water Test Results”

Many water contaminants are colorless, tasteless and odorless, which leads people to believe they have safe drinking water. In small quantities, toxic contaminants usually do not cause immediate health problems, but if consumed over a long period of time, they can cause serious and irreversible health complications. Testing your water is necessary to determine the overall safety of your drinking and/or household water and to provide information regarding what health effects may be related to your water quality.

How To Interpret Your Results

Column 1 - Parameter: These are the items included in our test procedures.

Column 2 - Results: These are the levels/amounts detected in your water. If your values exceed the Maximum Contaminant Level (MCL), as described by the Environmental Protection Agency (EPA), your result will appear in bold. MCLs ensure drinking water does not pose either a short-term or long-term health risk. EPA sets MCLs at levels that are economically and technologically feasible. Refer to the following list of contaminants for information and treatment options (as recommended by the EPA).

Column 3 - Units: Most data are reported in mg/L, which is equivalent to parts per million (ppm). This unit equates, for example, to 1 gram of contaminant (iron, lead etc) in every million grams of water.

Column 4 – National Standards (EPA): These data represent the maximum acceptable levels to be present as established by the EPA.

*Primary Standards: Are expressed as the maximum contaminant level (MCL) which is the highest level of contaminant that is allowed in drinking water. MCLs are enforceable standards.

**Secondary Standards: Are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) aesthetic effects (such as taste, odor, or color) in drinking water. Individual states may choose to adopt them as enforceable standards.

Exceeding these levels has adverse health effects.

Column 5 - Minimum Detection Level: The smallest quantity of a contaminant that our instruments at Chandler Analytical Laboratories can detect.

COLIFORM BACTERIA

Coliform bacteria are groups of bacteria that indicate the possible presence of infectious disease organisms. *E. coli* is just one type of bacteria that belongs to the coliform family, and is a subset of fecal coliform. It is recommended that water with coliform bacteria not be consumed until the problem is resolved.

If you have requested microbiological analyses to be conducted, your results will be indicated by a “Positive” indicating the presence of total coliform or a “Negative” indicating the absence of total coliform. All positive total coliform results will automatically be tested for the presence or absence of *E. coli* bacteria. A negative result for *E. coli* would then indicate the coliform bacteria present is a type other than *E. coli*.

Recommended Treatment: Chlorination, Ozonation or Ultraviolet Light.

Water should be re-tested to ensure treatment procedures were successful.

**Please Note: If any of the following parameters are found to be elevated in your water, it is advisable to consult your local health department, a physician or a local water treatment specialist.

ALKALINITY

Most natural drinking water has an alkalinity in the range of 10 to 500 mg/L. Alkalinity in drinking water is due largely to the presence of sodium, calcium and magnesium carbonate.

ALUMINUM

The fourth most common element in the earth’s crust, aluminum is naturally present in drinking water and is added during chlorination preparation at water facilities. Most of what is added is removed, but a residue may sometimes be passed into treated water. Aluminum may cause discoloration of water. Some studies indicate Alzheimer-like health effects may be associated with ingestion of large amounts.

Recommended Treatment: Distillation or Reverse Osmosis

ANTIMONY

Sources of antimony in water can be the result of discharge from petroleum refineries, fire retardants, ceramic, electronics, and solder, iron and steel manufacturing. May cause increase in blood cholesterol and a decrease in blood sugar. May also cause irritation to the eyes and skin tissue. The EPA lists antimony as a human carcinogen.

Recommended Treatment: Distillation or Reverse Osmosis

ARSENIC

Arsenic in water can result from both natural process and industrial activities, including smelting operations, use of certain pesticides, and industrial waste disposal. Arsenic compounds have been shown to produce acute and chronic toxic effects which include systemic irreversible damage. The EPA has classified it as a known human carcinogen, and has been found to cause malignant tumors on skin and in the lungs. May also cause adverse effects to the nervous system.

Recommended Treatment: Distillation, Reverse Osmosis or Activated Alumina Absorption

BARIUM

Barium is a naturally occurring metal found in many types of rocks. In stream water and most groundwater, only traces of the element are present. It is also used in oil and gas drilling muds, automotive paints, bricks, tiles and jet fuels. Exposure has been associated with hypertension and toxicity in animals. Affects the nervous and circulatory systems.

Recommended Treatment: Distillation or Reverse Osmosis

BERYLLIUM

Sources of beryllium include discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries. May cause intestinal lesions. Exposure affects skin and lung tissues. Has been found to be a human carcinogen.

Recommended Treatment: Distillation or Reverse Osmosis

CADMIUM

Cadmium is found in very low concentrations in most rocks, as well as in coal and petroleum and often in combination with zinc. It is introduced into the environment from mining and smelting operations. Other cadmium emissions are from fossil fuel use, fertilizer application, sewage sludge disposal or galvanized pipe corrosion. Acute and chronic exposure to cadmium in animals and humans may cause hypertension, anemia and kidney effects. May also cause bronchitis.

Recommended Treatment: Distillation or Reverse Osmosis

CALCIUM

Calcium exists in soil and rock such as limestone, dolomite and gypsum. Drinking water contributes only a small amount of the required daily intake. Concentrations as great as 1899 mg/L of calcium in water are reported harmless. It can be a nuisance as it contributes to the hardness of the water and build up on pipes or water heaters may inhibit their performance. Low levels can be helpful as it tends to form a coating on pipes which may prevent corrosion.

Recommended Treatment: Water Softener

CHLORIDE

Widely distributed in nature as salts of sodium (NaCl), potassium (KCl) and calcium (CaCl₂). Chloride can be leached from rocks into soil and water by weathering. Chloride in water can be a residual of chlorine, a chemical added by water treatment facilities to prevent the growth of bacteria in public water systems. High levels can contribute to corrosivity of plumbing and may be accompanied by high sodium levels which may be a health concern.

Recommended Treatment: Reverse Osmosis

CHROMIUM

Chromium is a naturally occurring metal. It is often used in electroplating of metals. Although chromium is not currently mined in the US, waste from old mining operations may enter surface and ground water through runoff and leaching. Exposure at high levels has been shown to result in chronic toxic effects such as dermatitis, ulceration of skin or liver, and kidney damage in animals and humans by ingestion.

Recommended Treatment: Distillation or Reverse Osmosis

COPPER

Water can be a significant source of copper intake depending upon the geographic location, water character, water temperature, and the presence of copper pipes. At concentrations above 1 mg/L, copper can stain laundry and plumbing fixtures. Copper can also cause a greenish/blue tint to blond hair. Copper is an essential element at lower levels, but levels above 5 mg/L can cause gastrointestinal disturbances or other acute toxic effects such as kidney damage.

Recommended Treatment: Distillation, Reverse Osmosis or “Soda Ash” Feed

HARDNESS

Hardness is usually caused by the presence of calcium and magnesium in water. They can combine with soap to form a scum on water and a ring around the tub. You may find larger amounts of soap are required to form washing suds. Hardness can shorten the life span of appliances such as dishwashers, washing machines and water heaters.

Recommended Treatment: Water Softener – To convert your results from mg/l to grains per gallon, divide your hardness results by 17.1

IRON

Iron in drinking water is a very common problem. It occurs naturally from rock or can be introduced by plumbing materials. When iron comes in contact with oxygen, it changes to a reddish compound that can discolor bathroom fixtures and laundry. Toxic doses can cause depression, rapid and shallow respiration, respiratory failure and cardiac arrest.

Recommended Treatment: Water Softener, Oxidation and Filtration or Distillation

LEAD

The main source of lead in drinking water is leaching from lead piping and lead solders. Lead enters primarily in areas having soft, acidic waters. When elevated lead levels are found, consult a physician. May cause damage to the nervous system, kidneys and reproductive systems. Children and fetuses are especially sensitive to lead poisoning.

Recommended Treatment: Distillation or Reverse Osmosis

MAGNESIUM

Magnesium is commonly found in rock such as granite, sandstone, limestone and dolomites. High levels can be a nuisance contributing to the hardness of the water and inhibiting performance of pipes and water heaters.

Recommended Treatment: Water Softener

MANGANESE

Manganese in water is a common, naturally occurring problem but can also be introduced by industry. It can produce a brownish discoloration and have a very unpleasant odor and taste. It may produce black deposits and black filaments. Chlorine bleach should not be used in laundry washed in water with a high iron or manganese content because it can cause stains to set. Currently known cases of manganese poisoning have occurred at elevated levels much higher than levels found in most natural water.

Recommended Treatment: Water Softener, Oxidation and Filtration

MERCURY

Mercury is one of the least abundant elements in the earth's crust. This metal is used in electrical equipment and some water pumps. It usually gets into water as a result of improper waste disposal. Exposure at high levels may result in kidney disease or central nervous system problems.

Recommended Treatment: Distillation or Reverse Osmosis

NITRATE

Nitrates occur naturally; nitrates are produced when the nitrogen from ammonia or other sources combines with oxygenated water. Major sources of nitrate include septic tanks, sewage treatment systems, decaying plant debris, fertilizers and animal waste. The toxicity of nitrate in humans is due to the body's reduction of nitrate and nitrite. These contaminants can cause methemoglobinemia (blue baby syndrome). Therefore, notifying your baby's pediatrician of these levels is advisable.

Recommended Treatment: Distillation, Reverse Osmosis or Ion Exchange Systems with Nitrate Specific Resin

pH

A measure of the acidity in the water. Water pH is considered within normal range by the EPA when it measures from 6.5 to 8.5. A value of 7 is neutral, which is the ideal pH. Values lower than 7 are called "acidic" and values above 7 are called "basic" or "alkaline". A pH difference of one actually represents a tenfold difference in acid or base content. Acidic water dissolves metals readily and can be corrosive to plumbing which can increase the amount of toxic metals leaching into the water. Drinking water with a high pH by itself is not necessarily a problem, although the underlying cause may be a health concern.

Recommended Treatment: Low pH: Neutralizing Chemical Filter, "Soda Ash Feed" or Limestone Tank

SELENIUM

Selenium is found naturally in food and soils. It is used in electronics, photocopy operations, glass manufacturing, chemicals, drugs and as a fungicide and feed additive. Exposure above MCL can cause dermatitis, hair or fingernail loss, nervous system disorder and circulatory problems.

Recommended Treatment: Distillation or Reverse Osmosis

SILVER

Silver is a relatively rare metal originating from natural sources and from industrial waste. The only adverse effect resulting from chronic exposure to low levels of silver in animals and humans is a blue-gray discoloration of the skin and internal organs.

Recommended Treatment: Distillation or Reverse Osmosis

SODIUM

Sodium in water can come from geological sources, road salt or as a result of using a water softener. A guidance level of 20 mg/L in drinking water is suggested by the EPA for the high risk population of hypertensive and heart patients. If your sodium intake is being monitored, consult your family physician for advice.

Recommended Treatment: Distillation, Reverse Osmosis or Demineralization

SULFATE

Sulfate is found in almost all natural water. It may enter through waste discharges and may indicate septic leaching in to the water supply. Sulfate presence can cause a pungent odor and taste in drinking water and may have a laxative effect. Taste threshold has been established by the EPA as 250 mg/L and health effects when levels approach 500 mg/L.

Recommended Treatment: Oxidation and Filtration, Distillation or Reverse Osmosis

TOTAL DISSOLVED SOLIDS

TDS values are a measure of the amount of solids dissolved in your water. If you left a small amount of coffee in a cup for a few days, the water would evaporate and the dissolved solids would stay behind. The TDS value is derived from certain items on your report and possibly other soluble substances.

Recommended Treatment: Distillation or Reverse Osmosis

THALLIUM

Thallium contamination can be the result of leaching from ore-processing sites, discharge from electronics, glass and drug factories and pesticides. Adverse health affects include hair loss, changes in the blood and kidney, intestine or liver problems.

Recommended Treatment: Distillation or Reverse Osmosis

ZINC

Zinc is considered an essential element in human and animal nutrition. It may come from industrial contamination or corrosion of plumbing. In concentrations over 5 mg/L, zinc produces an objectionable taste and may cause water to appear milky, or upon boiling, to seem to have a greasy surface scum. Cases of zinc poisoning have been reported from prolonged consumption of water at concentrations of 40 mg/L. Can affect the prostate, bone, muscle and liver.

Recommended Treatment: Distillation or Reverse Osmosis