BASIC PROFILE (WELL WATER)

The Basic Profile is designed to provide a standard water analysis that can quickly and accurately determine the general quality of the water you drink. It is composed of the following 14 test parameters including bacteria, physical properties and chemical constituents:

1. Coliform Bacteria – Coliform bacteria are not disease-producing organisms themselves but are used as an indicator of disease producing organisms. When coliform bacteria are present, there is an increased probability that the source water may have been contaminated by surface water or fecal material and may also contain disease producing organisms.
2. pH – pH is a measure of the acid or alkaline content of water. Water with a low pH (acidic) is corrosive to plumbing and may cause leaching of toxic metals such as lead from pipes and fixtures.
3. Turbidity – Turbidity is the presence of suspended material such as clay, silt, plankton, finely divided organic material and other inorganic materials. Turbidities in excess of 5 units are detectable in a glass of water and are usually objectionable for aesthetic reasons.
4. Color – Water color may be caused by dissolved organic material from decaying vegetation and/or certain inorganic material such as iron or manganese.
5. Odor – Odor in water can be caused by foreign matter such as organic compounds, inorganic salts or dissolved gases. These materials may come from domestic, agricultural or natural sources.
6. Chloride – The concentration at which the average person can detect a salty taste from chloride in drinking water is 250 mg/L. A very high chloride level can lead to corrosion of pipes and heating equipment and is usually associated with an elevated sodium level.
7. Nitrate Nitrogen – An elevated nitrate nitrogen level may be an indication that agricultural fertilizer or waste disposal is polluting the water. The maximum level of 10 mg/L has been established to prevent a disease called methemoglobinemia “blue baby disease” in infants.
8. Sulfate – Sulfate in drinking water has no beneficial effects. The desirable limit is 250 mg/L. At higher concentrations sulfate may have a laxative effect and cause taste deterioration.
9. Hardness – Calcium and magnesium salts are the major cause of hardness in water supplies. Although not detrimental to health, hard water retards the cleaning action of soaps and detergents. When hard water is heated it will deposit a hard scale on heating coils and cooking utensils with a consequent waste of fuel.
10. Sodium – For healthy people, the sodium content of water is relatively unimportant because the intake of sodium from other drinks and foods is so much greater. Persons following a low sodium diet because of hypertension, kidney, or cardiovascular disease should be concerned with an elevated level of sodium.
11. Copper – Copper in small amounts is not considered detrimental to health but will impart an undesirable taste to drinking water.

12. Iron – Iron levels above 0.3 mg/L can discolor fixtures and laundry and may impart a metallic taste to the water. Iron is frequently present in water because of the large amounts present in soil. Corrosive water will also pick up iron from pipes.
13. Manganese – Manganese at levels greater than .05 mg/L may produce brownish black stains in laundry and on fixtures and impart an objectionable odor and taste. It is usually found along with iron in soil with a high mineral content.
14. Fluoride – Fluoride can occur naturally in well water as a result of the geological composition of soils and bedrock and is often added to public water supplies to deter dental cavities. However, levels exceeding 2.0 mg/L may cause tooth discoloration and persistent exposure to levels above 4.0 mg/L may cause pits in the tooth enamel of children and increase the likelihood of bone fractures in adults.

Basic Profile

OVERVIEW

The Basic Profile was designed to provide a standard water analysis that can quickly and accurately determine the general quality of the water you drink. It is composed of 14 test parameters including bacteria, physical properties and chemical constituents. The Basic Profile meets the needs of both homeowners and professionals and is used anywhere that a general water screening is required. The basic profile results are generally available in 2-3 business days and include a comprehensive easy to read report.

WHEN TO TEST?

The Environmental Protection Agency (EPA) recommends that all home owners have their well water tested annually. Many water contaminants have no color, odor, or taste and can only be detected through laboratory analysis. Houses that have children, pregnant women, and people with compromised immune systems are especially at risk when contaminants are present in drinking water. The basic profile meets the minimum requirements specified by CT state statutes. Additional tests should be considered if there is reason to believe that other contaminates are present.

WHAT IS THE SIGNIFICANCE OF CONTAMINANTS IN THE BASIC PROFILE?

The health effects vary by contaminant. Some analytes such as bacteria, nitrates and nitrites are dangerous when present at levels exceeding their maximum contaminant levels (MCL's). On the other hand, parameters such as turbidity, color and odor are of aesthetic significance but do not have health implications. Metals can impart a bad taste to drinking water and leave colored stains on sinks and faucets. Acidic water will promote leaching of metals from pipes and fixtures causing stains on sinks, tubs, toilets, appliances and laundry and eventual destruction of the plumbing system. Excessively hard water will cause scaling throughout the plumbing and water heating system leading to decreased flow and heating efficiency. Hard water is also aesthetically unpleasant due to its ability to deter soap from lathering.

Lead

OVERVIEW

Lead is a metal found in natural deposits that is commonly used in household plumbing materials and water service lines. Although most homes have very low levels of lead in their drinking water, some homes have levels greater than the USEPA maximum limit. Since you cannot see, taste or smell lead dissolved in water, testing is the only sure way of knowing if there are harmful amounts in your drinking water.

SOURCES

Lead seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead pipes, lead-based solder, brass and chrome-plated brass.

In 1986, Congress banned the use of solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%. Despite these restrictions, many houses, old and new, still have elevated levels of lead contamination in their water systems.

When water stands several hours in plumbing systems containing lead, the lead may dissolve in the water. This means that the first water drawn from the tap after several hours of inactivity can contain dangerously high levels of lead. Problems are most likely to exist in newer plumbing systems which have not yet built up an inner coating of mineral deposits or in older homes where corrosive water prevents the formation of deposits.

WHEN TO TEST

When testing your drinking water for lead it is recommended that you do two tests. The first test should be a first morning draw used to evaluate lead leached from local plumbing by standing water. Next, supply lines should be flushed and a 2nd draw taken to evaluate lead coming from remote sources outside of your household plumbing.

HOW TO TREAT WATER CONTAMINATED WITH LEAD

If your testing shows that the lead in your drinking water is coming from pipes or fixtures within your house, and not from an outside source, you may be able to reduce the lead through the following steps:

- Flush your pipes before drinking, and only use cold water for consumption. The more time water has been sitting in your home's pipes, the more lead it may contain. 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.
- 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.

If a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, then you may want to take the following additional measures

- Do a comprehensive water test to determine at least the pH and hardness of the water. Acidic and soft water can be very corrosive to the plumbing, causing lead from fixtures, pipes and solder connections to dissolve in the water. Acid neutralizers can be used to treat water with a low pH, making the water less corrosive and less likely to dissolve lead.
- Treatment devices such as reverse osmosis or distillers can effectively remove lead from your drinking water. These devices are limited in that each unit treats only water that flows from the faucet to which it is connected, and all devices require periodic maintenance and replacement.
- If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with your electrician to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself! Improper grounding can cause electrical shock and fire hazards.
- If you receive water from a public water supply determine if the service line that connects your home to the water main is made of lead. A licensed plumber can inspect the service line, as well as, check to see if your home's plumbing contains lead solder, lead pipes or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. Public water systems are required to reduce the water lead level to below 15 ppb (0.015 mg/L).

Arsenic

OVERVIEW

Arsenic is a metal that has no smell or taste. Arsenic is naturally present in bedrock in many places throughout CT and RI. When a drinking water well is drilled into bedrock containing arsenic, the arsenic can get into the well water. We know that there are private wells in locations across CT with high levels of arsenic.

SOURCES

Arsenic can occur naturally in soil and bedrock in many parts of the United States. Arsenic can also be present due to human land use and industrial activities. Arsenic has been used in some pesticides and as a wood preservative. The use of arsenic in pesticides has largely been discontinued, but there is still the possibility that arsenic has built up in the soil where it was once used.

HEALTH EFFECTS

The EPA and expert scientific committees have classified arsenic as a human cancer-causing agent. Research indicates that people living in areas where water concentrations are very high are more likely to have bladder, lung, or skin cancer. They are also more likely to have problems with their skin, and with their cardiovascular, immune and neurological systems. These toxic effects of arsenic exposure develop after many years of exposure.

WHEN TO TEST

You should test for arsenic when you buy a house with a well or at the time a new well is drilled. It is possible for arsenic levels in well water to fluctuate so even if one arsenic test shows no arsenic problem, it is a good idea to test for arsenic every 5 years. If you have a treatment system to remove arsenic from your water, you should test every year to be sure your treatment system is working properly.

HOW TO TREAT WELLS CONTAMINATED WITH ARSENIC

Removal of arsenic from well water can be a complicated process. If your water has high arsenic, we recommend that you consult a knowledgeable water treatment specialist. There are several treatment technologies that can remove arsenic from well

water. These technologies include metal oxide filters, ion exchange systems and reverse osmosis systems. However, the chemical parameters of your well water and the chemistry of the arsenic present in your water will dictate which treatment technology will effectively remove the arsenic. This is why it is important to involve a water treatment specialist.

Uranium

OVERVIEW

Uranium is an element that has been in rocks since the earth was formed. Not all rocks contain uranium, but there are some places in the world where uranium is in the bedrock. Other related elements that may be found in association with uranium include radon (Rn-222). These other elements are part of a sequence formed through a transformation (decay) process that begins with the most prevalent form of "natural" (unprocessed) uranium (U-238).

SOURCES

Uranium occurs naturally in some Connecticut bedrock ground water, therefore deep bedrock wells are susceptible to contamination. Shallow wells that do not reach bedrock are less susceptible to uranium contamination. Wells with high levels of uranium have been found sporadically all around Connecticut. Uranium gets into well water from bedrock that contains uranium. The amount of uranium in bedrock and well water will vary greatly from place to place and without testing, it is not possible to determine if the water can be considered safe for drinking.

HEALTH EFFECTS

The chemical properties of uranium in drinking water are of greater concern than its radioactivity. Most ingested uranium is eliminated from the body. However, a small amount is absorbed and carried through the bloodstream. Studies show that drinking water with elevated levels of uranium can affect the kidneys over time. Bathing and showering with water that contains uranium is not a health concern.

WHEN TO TEST

You should test for uranium when you buy a house with a well or at the time a new well is drilled. It is possible for uranium levels in well water to fluctuate so even if

one uranium test shows no uranium problem, it is a good idea to test for uranium every 5 years. If you have a treatment system to remove uranium from your water, you should test every year to be sure your treatment system is working properly.

HOW TO TREAT WELLS CONTAMINATED WITH URANIUM

Point-of-use (POU) water treatment devices treat water at just one faucet. They differ from point-of-entry (POE) devices, which are installed on the water line as it enters the home and treat all the water that enters the home. Because uranium gets into your body only through ingestion (and not through the skin or through inhalation), it is not necessary to treat all the water in your home, but only the water you drink.

Reverse osmosis (RO) and ion exchange are the most common types of treatment systems used for uranium removal and are both very effective. Both types of treatment can be installed as POU or POE systems. However, there are other technologies that will remove uranium as well. Decisions about treatment systems depend on many factors, including what else is in your water, water usage, installation costs and maintenance costs. You should consult a water treatment expert to help you decide what treatment system is best for your situation.

Volatile Organic Chemicals (VOCs)

OVERVIEW

Volatile Organic Chemicals (VOCs) are carbon-containing compounds that evaporate easily from water into air at normal air temperatures. This is why the distinctive odor of gasoline and many solvents can easily be detected. VOCs are contained in a wide variety of commercial, industrial and residential products including fuel oils, gasoline, solvents, cleaners and degreasers, paints, inks, dyes, refrigerants and pesticides. People are most commonly exposed to VOCs through the air, in food, through skin contact, and in drinking water supplies.

SOURCES

VOCs enter private water supplies through accidental spills and leaks, improper storage and disposal, and industrial discharges and runoff. When VOCs are spilled or improperly disposed of, a portion will evaporate, but some will soak into the ground.

In soil, VOCs may be carried deeper by rain, water or snow melt and eventually reach the groundwater table. When VOCs migrate underground to nearby wells, they can eventually end up in drinking water supplies.

HEALTH EFFECTS

VOCs vary considerably in their toxic (or harmful) effects. VOCs are easily absorbed through the digestive tract and are then carried rapidly throughout the body by the blood. Once ingested some VOCs will collect in and cause damage to the brain, kidney, liver and nervous system. Some VOCs are known or suspected carcinogens (or cancer-causers). Safe drinking water levels called Maximum Contaminant Levels (MCL) have been established by the EPA for many VOCs. MCLs are levels of chemicals in drinking water that the EPA considers to be safe for people to drink, including sensitive people such as the very young or the elderly.

WHEN TO TEST

Testing of private well water for VOCs and petroleum products is indicated if the water has the taste or odor of gasoline or solvents. Wells should also be tested if they are within one to two city blocks (500 to 1000 feet) of a former or existing gasoline service station, or other fuel tanks.

HOW TO TREAT WELLS CONTAMINATED WITH VOCS?

Individuals who have received one report of the occurrence of VOCs in their private well may wish to have the well retested before taking action to treat or replace their water supply. If chemical contamination is confirmed, construction of a safe, uncontaminated well, or connection to a safe well or public water system are the best options for private well owners whose water contains VOCs at or above health risk limits. When VOCs are detected at low levels, steps may be taken to prevent further contamination by treating or removing the source. Removal of the source is not always possible, and groundwater treatment is costly and time consuming.

Pesticides

OVERVIEW

A pesticide is a chemical substance used to kill or control a pest. "Pest" is a simple catchall term that includes undesired insects, weeds, rodents, fungi, bacteria, and other organisms. Pesticides are commonly applied on farms, fruit orchards, golf courses, and residential lawns and gardens. Many pesticides are also used inside homes and other buildings.

SOURCES

Pesticides can enter ground water both directly and indirectly. Direct contamination may occur from pesticide spills around a poorly sealed well, improper application of pesticides through irrigation systems, and improper storage and disposal of pesticides or pesticide containers. Indirect contamination can occur as a result of normal application. Surface water, rain and snow can carry pesticides from areas such as agricultural fields, golf courses, and residential properties into lakes, rivers, reservoirs and aquifers. There are three ways in which you can be exposed to pesticides in drinking water:

- by ingestion-either by drinking the water directly or eating foods cooked with water
- by breathing in pesticide fumes in the shower or when cooking or washing
- by absorbing the pesticides through the skin during showering, swimming, or washing

WHAT FACTORS CONTRIBUTE TO CONTAMINATION?

- the distance between the well and a source of contamination
- the application, frequency and quantity of pesticides used
- the depth of a well
- the local geology surrounding the well
- the flow of the ground water

Bacteria

OVERVIEW

Coliform bacteria are commonly found in soil, on vegetation, and in surface water. They also live in the intestine of warm-blooded animals. These bacteria are used as indicators in water tests because their presence indicates that disease-causing

organisms could also be in the water. One particular type of coliform organism, called E. coli, is an indicator of fecal contamination. Feces and sewage wastes are usually the source of E. coli bacteria.

SOURCES

Well water contamination is usually caused when surface water picks up bacteria from the ground and runs off into your well through a defect in your well casing. Coliform bacteria is commonly detected after heavy rains and hurricanes due to this excessive run off of rain water. Improperly sealed wells can also allow sewage, insects and rodents to contaminate your well water.

HEALTH EFFECTS

Most coliform do not cause illness, however they indicate the potential for disease causing strains of bacteria, viruses, and protozoa to be present. Waterborne disease from these organisms typically involves flu-like symptoms such as nausea, vomiting, fever, and diarrhea.

WHEN TO TEST

The EPA recommends that all private wells be tested annually for total coliforms as part of the basic test for drinking water. Bacteria testing should also be done for the following:

- After wells are installed, repaired or reconditioned.
- A sudden change occurs in your water's taste, appearance, or odor.
- The water turns cloudy after rainfall or the top of the well was flooded.
- You suspect contamination from a septic system or farm that is within 50 ft of your well.
- Family members are experiencing unexplained flu-like symptoms.

HOW TO TREAT WELLS CONTAMINATED WITH BACTERIA

Most bacterial contamination can be rectified through well and supply line chlorination. If contamination occurs regularly a water treatment specialist may be needed to look for defects in your well casing. Defects include insufficient well casing depth, improper sealing, and cracked well casings.

Waste Water, Soil & other Contaminants

OVERVIEW

SAGE can assist in providing testing for almost any drinking water or waste water contaminant. No job is too big or too small. Contact a SAGE inspector who will coordinate any additional testing that is needed.