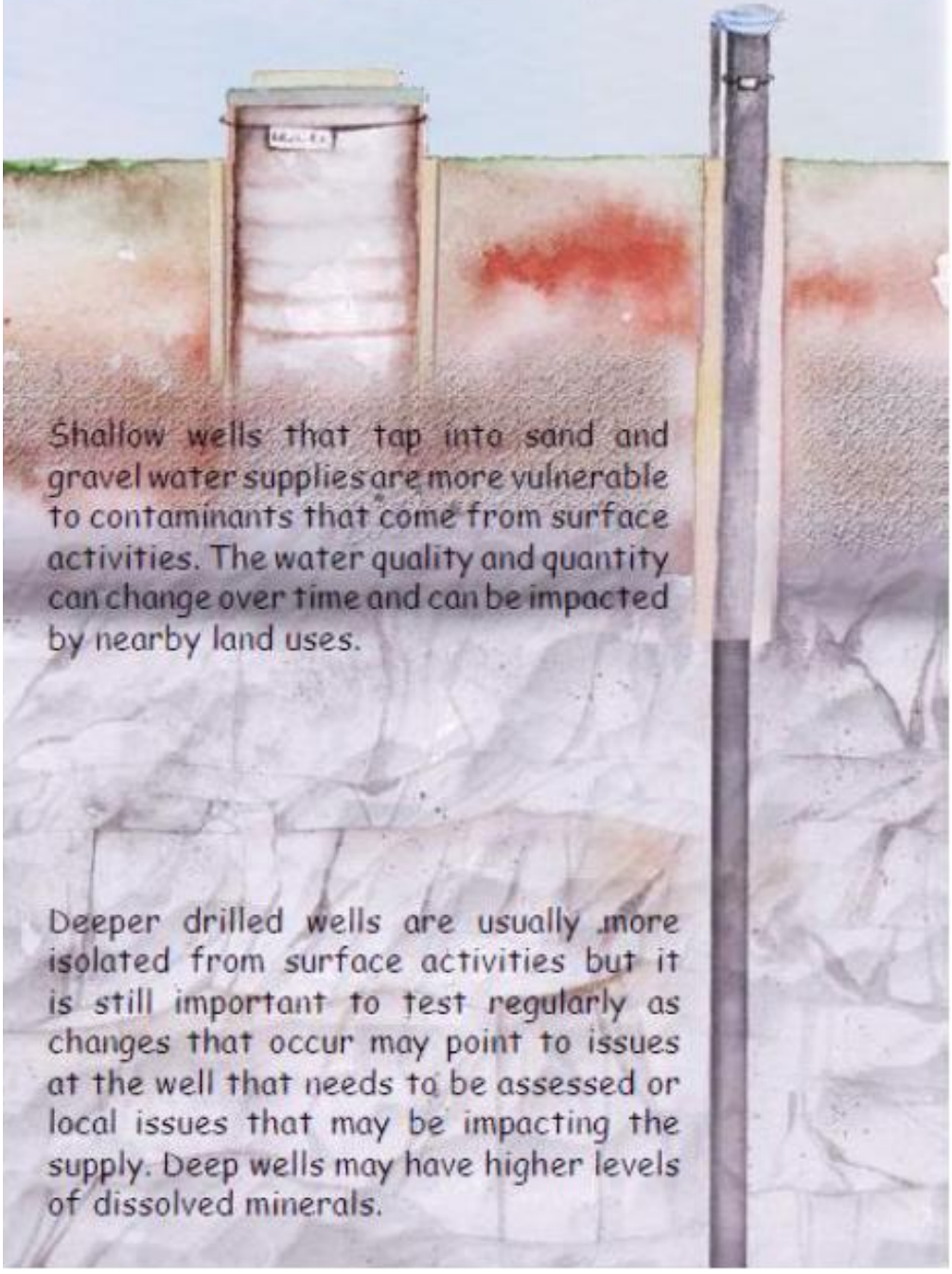
Test Your Well Water - What Should I Test

Chemically pure water does not exist for long in nature. Water is an excellent solvent. It dissolves and carries some of almost everything it touches. While falling as precipitation, water picks up gases, ions and dust particles from the atmosphere. When water reaches the earth it flows over or through plant materials and surface layers of soil and rock, dissolving minerals. In most cases, natural groundwater is quite safe, when contamination is detected it is often a result of poor well location, poor well construction, lack of maintenance or poor management.

Test your Well - What to Test for.

Tests of well water have to be very specific. It is not possible to do one water test or test one well and determine what the contaminant levels are in other wells in that area. A neighbouring well may not be tapping into the same water bearing layer or there may be specific things at the well head that influence the water quality. Well owners need to monitor water quality regularly and keep track of any changes that occur over time.



Shallow wells that tap into sand and gravel water supplies are more vulnerable to contaminants that come from surface activities. The water quality and quantity can change over time and can be impacted by nearby land uses.

Deeper drilled wells are usually more isolated from surface activities but it is still important to test regularly as changes that occur may point to issues at the well that needs to be assessed or local issues that may be impacting the supply. Deep wells may have higher levels of dissolved minerals.

What Impurities Come from Surface Activities?

Bacteria, nitrate and sodium are the most common impurities that impact well water that come from human activities at the land surface.Other contaminants that have been detected less frequently include pesticides and Volatile Organic compounds.

Bacteria: Total colliform and E. Coli bacteria are tested by health units and are used as indicators. The presence of these bacteria in your well water indicates that something from surface has impacted your well water. Total coliforms may indicate decaying vegetation or insects but E. Coli shows a more serious quality problem. Common sources of E. Coli near wells include a critter falling into the well, septic systems, or manure. Check the well, the area immediately around the well and try to determine the source of bacterial contamination. In many eases, repairing the well will improve bacterial problems.

Nitrate is a form of nitrogen that moves with water. The most common sources of nitrate near rural wells are septic system, fertilizers and manure spread on gardens or fields. Elevated nitrate is linked with Methemoglobinemia or "blue baby syndrome" and in adults, nitrates can form chemicals called nitrosamines that have been linked to cancer. The maximum level for nitrate in water is 10.0 mg/L.

Sodium is a necessary dietary element and can occur naturally in water. Salt comes from softeners, septic systems or from road de-icing. The maximum level for sodium in drinking water is 250 mg/L.

Pesticides: Pesticides and herbicides have been used regularly in a number of industries - agriculture, forestry, pest control to name a few. These chemicals are toxic and would be a serious concern if detected in your well water. The Well Wise Pesticides package analyzes the pesticides most commonly used in Ontario during the last 30 years.

Volatile organic compounds (VOC) are widely used as cleaning and liquefying agents in fuels, paints, degreasers, solvents, polishes, cosmetics, and cleaning solutions. The impurities in fuels and solvents can change over time and in nature. The Well Wise Fuels and Solvents packages analyses many different substances and their breakdown products.

What may come from the pipes?

Some impurities are picked up by water as it passes through household plumbing. The presence of these impurities may indicate corrosion of the pipes or another component of the distribution system. This is more of a concern if water is acidic. Some water treatment by-products may impact the corrosion of pipes.

pH indicates the acidity of the drinking water. The recommended limit for pH is 6.5 - 8.5. The pH scale is from 0 to 14 units with a value of 7 being neutral (equal amounts of acid and base).
pH values less than 7 are acidic, and pH values above 7 are basic (alkaline).

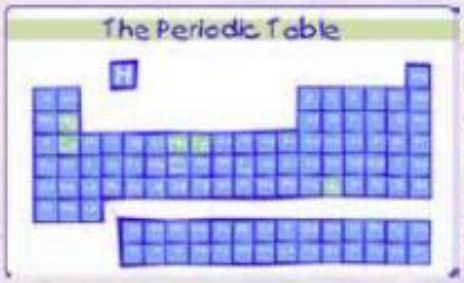
Lead is a toxic metal which was used in the past in construction of household plumbing systems. Newer plumbing ensures lead free pipes and solder but this wasn't always the case. Check the age of your pipes and monitor your pH especially in areas where the water is naturally soft. Lead may also be found naturally in some geological deposits.

Cadmium and Zinc in water supplies often is from the corrosion of galvanized pipes or soldered joints in copper pipes by acidic water. Cadmium may also come from disposal of waste from photographic, metal plating or pesticide manufacturing industries.

Copper is an important mineral for the formation of red blood cells. However, high amounts of copper in water can cause stomach aches, vomiting, or diarrhea. The maximum level for copper in water is 1.3 mg/L.

What can be present in groundwater naturally?

There are 103 different elements on earth. Some of these elements are very beneficial, others can be toxic in small amounts. Your age, weight and health can all impact your ability to metabolize the different impurities. Minerals like calcium, magnesium, sodium and chloride are of little concern in freshwater and are even desirable in low levels as many feel this contributes to good tasting water. However many undesirable chemicals also dissolve in water. Groundwater is generally a clean, safe, sustainable source of water, but in some areas natural impurities may be present that impact the quality and safety of the water. Impurities may cause a change in color, odor or smell or may be undetectable without testing. Generally speaking, deeper bedrock wells are more likely to have higher levels of these impurities than a well that accesses an overburden water bearing zone. Some natural impurities that have been observed in well water sampled in local areas in Ontario are hardness ($CaCO_3$) Iron, Manganese, Sulphur, Fluoride, Uranium, and Arsenic.



Groundwater is a bit like coffee....

As rainwater percolates through soil and rock, it dissolves some of the material it comes in contact with and carries it in the water. Percolated coffee gives is a common example of the same process. When you are brewing coffee, the strength of the coffee is determined by the rate the water passes through the grind and the amount of coffee in the brew. Studies have shown that in many cases, bedrock wells tap into older water. At the surface, spring floods or heavy rain may move through the top few layers and reach a shallow aquifer in a few days or weeks. In deeper supplies, it may have taken centuries for the water to percolate through the soil and rock, this results in more dissolved mineral. Many people are familiar with this idea and recognize that deeper supplies often have harder water or may have more noticeable mineral impurities.

Ontario's groundwater is monitored through the Provincial Groundwater Monitoring Network (PGMN). Conservation authorities across the province monitor over 400 wells for impurities. Municipal water supplies also test routinely for impurities. Large cities test over 26 000 times per year for bacteria! Private wells are the responsibility of the well owner and it is up to you to test your water regularly and for more than just the complimentary bacterial test.

For more information on water testing and impurities in well water–visit xxxxxxxxxxxxx
www.ogwa.ca/WellWise/WaterTesting.pdf

We can help you determine the most appropriate test package for your water supply. We can also help you understand where the impurities may be coming from and help you determine your best course of action you can take to improve your situation.

Recommendations for Water Testing:

Bacteria and nitrate are the most common health related contaminants in well water in Ontario. Well owners should test for bacteria using the complimentary test offered through health units. The Metals, Minerals, & Salts package offered by the Well Wise Centre is a good general chemistry package that tests for nitrate and other common impurities. Well water should be tested for a package like this once a year. If you have a well that taps into bedrock or is a spring source, you should test for a metals and minerals package at least once to determine if there are naturally occurring elements that are of concern in your water supply.

For More Infomartion:

Well Wise & OGWA **519-245-7194 Water Testing**

Well Aware program www.wellaware.ca

Ontario Groundwater Association (OGWA) www.ogwa.ca

Ministry of Environment
www.ene.gov.on.ca/envision/water/groundwater/groundwatermain.htm

Ontario Geological Survey:
www.mndm.gov.on.ca/MNDM/MINES/ogs/default_e.asp

Provincial Groundwater Quality Monitoring Network
www.ene.gov.on.ca/programs/5311e.htm

International Association of Medical Geology:
www.medicalgeology.org/

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