

Water Quality Glossary of Terms

Greater Vernon Services provides a comprehensive list of terms related to water quality.

Aquifer

An aquifer is an underground geological formation or group of formations that contain water, a source of ground water for wells and springs.

Balancing Reservoir

A balancing reservoir is a principal reservoir into which a main delivers water, and from which water is drawn in the distribution system.

Colour

The colour of water is a physical characteristic that can result from dissolved organic matter, metals and industrial wastes. In the GVS Water system, coloured water is caused mainly by the decay of plant tissue which causes the release of humic acids and other organic matter.

Cryptosporidium

Cryptosporidium is a microscopic, single-cell parasite that is about 20 times smaller than the width of a human hair. In water it lives in a round egg called an "oocyst" that is highly resistant to cold, moist conditions. Contamination in the water comes from animal or human feces containing Cryptosporidium in contact with surface water, such as lakes, rivers, streams, creeks and ponds. The most common symptoms of cryptosporidiosis include watery diarrhea, abdominal cramps, nausea, and headaches. These symptoms occur within two to 25 days of infection and usually last one or two weeks; in some cases they stick around for up to a month. Similar to Giardia, avoiding the problem is the first step to treatment and prevention of an outbreak. Avoid having animal feces where it can wash into the water supply. A high level of water treatment membrane filtration, rapid sand filtration with a coagulant, or UV disinfection will treat contaminated sources.

E. coli

E. coli, short for Escherichia coli, is a type of bacteria found in the intestines of warm-blooded animals, such as cattle and humans. Most strains of E. coli are not harmful to humans, as they do not produce debilitating toxins. In fact there are only a few E. coli strains that are pathogenic. E. coli 0157:H7 is the pathogenic strain that caused the fatal outbreak in Walkerton, Ontario in May, 2000. This strain is usually thought of as the hamburger disease as it is found in cattle feces and consequently contaminates processed meats.

In water E. coli comes from human and animal wastes and during precipitation it can be washed into creeks, rivers, lakes and groundwater. In the case of drinking water quality E. coli is used as an indication of fecal contamination. Most of the E.coli strains are harmless and in fact live naturally in the intestines of healthy humans and animals. However, E. coli 0157:H7 produces a powerful toxin called a verotoxin. Infection with 0157:H7 often causes bloody diarrhea and

abdominal cramps. The first step to treatment and prevention of a fecal contamination problem is to prevent cattle or deer grazing near the source drinking water source. However providing adequate disinfection in the drinking water (ie chlorination) will effectively inactivate bacteria.

Freshet

A freshet occurs when a sudden overflow of a stream is caused by heavy rain or nearby thawing of snow or ice.

Giardia lamblia

Giardia lamblia is a parasite carried by humans and wild and domesticated animals. It exists in 2 life stages: the active trophozoite stage in which it reproduces and develops, and a dormant cyst stage in which the parasite is inactive and resistant to adverse environmental conditions. Giardia lives in the intestine of an infected human or animal and enters the water via fecal contamination of the water supply via an infected animal. The human illness is known as giardiasis, which causes an interference with nutrient absorption. Diarrhea creating great fatigue and weight loss occurs if the disease is prolonged. In terms of prevention and treatment, avoiding the problem is the first step. This means avoid having animal feces where it can wash into the water supply. Chlorine alone can be effective in killing the cysts if there is adequate contact time. Filtration as well as multiple disinfections is the most successful.

Hardness

As water passes through the soil, rock minerals dissolve and cause hardness. Hardness is most commonly caused by concentrations of calcium, and to a lesser extent magnesium, in the water. As a convention hardness is expressed in mg/L of calcium carbonate (CaCO₃). Hard water is an aesthetic concern, it can affect taste and increase soap consumption. Also when hard water is heated, deposition of scale can be noted in appliances, pipes and taps. Alternatively, soft water can increase corrosion of pipes and fixtures.

80-100 mg/L as CaCO₃

200 mg/L as CaCO₃

> 500 mg/L as CaCO₃

Interim Maximum Acceptable Concentration (IMAC)

The IMAC is a health-related objective established for parameters when there is insufficient toxicological data to establish a MAC with reasonable certainty. When it is not feasible for practical reasons to establish a MAC at a desired level, an interim objective may be established at an achievable level.

Maximum Acceptable Concentration (MAC)

The MAC is a health-related objective established for parameters which when present above a certain concentration have known or suspected adverse health effects. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the contaminant. In the event that an MAC is exceeded in drinking water the local Medical Officer of Health (MOH) must be notified. Ultimate judgements regarding human health issues are made by the local MOH under the legislation of the Health Promotion and Protection Act.

Schedule A and Schedule B

Schedule A

Water Quality Standards for Potable Water (sections 2 and 9)

Parameter:	Standard:
Fecal coliform bacteria	No detectable fecal coliform bacteria per 100 ml
Escherichia coli	No detectable Escherichia coli per 100 ml
Total coliform bacteria	
(a) 1 sample in a 30 day period	No detectable total coliform bacteria per 100 ml
(b) more than 1 sample in a 30 day period	At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

Schedule B

Frequency of Monitoring Samples for Prescribed Water Supply Systems (sections 0)

Population Served by the Prescribed Water Supply System:	Number of Samples Per Month:
less than 5,000	4
5,000 to 90,000	1 per 1,000 of population
more than 90,000	90 plus 1 per 10,000 of population in excess of 90,000

Trihalomethanes

Trihalomethanes (THMs) are compounds which can be potentially formed in drinking water as a disinfection by-product. There are as many as 10 different THM compounds, but only 4 (chloroform, bromodichloromethane, dibromochloromethane and bromoform) occur in drinking water to any significant degree. Collectively the above 4 THMs are referred to as total trihalomethanes. THMs are formed when naturally occurring organic matter in the water reacts with chlorine and/or bromine. The Canadian guideline for total TTHMs in drinking water is 0.1mg/L.

Turbidity

Turbidity is the measure of relative clarity of a liquid (water in this case) in ntu's (nephelometric turbidity units). Turbidity consists of particles in the water that diffract a beam of light. These particles may consist of fine sands, clay, silt, finely divided inorganic and organic matter, plankton and other microscopic organisms. Erosion of natural substances and decomposition of organics will cause particles to suspend in water.