Recently we received a question regarding what to do if there is a problem identified by a water quality test at your cottage.

This article reviews *a few* of the most likely issues with drinking water at the **KENNISIS Lakes**, but given the number of treatment options (UV, Reverse Osmosis, Chlorination etc.) and differences in water sources (surface, well) you will need to seek professional help with any specific concerns you may have. This article is not a definitive reference manual for safe drinking water but is intended to direct you to the proper authority. Common issues and approaches are discussed.

To learn more about drinking water safety, contact the HKPR Health Unit toll-free at 1-866-888-4577 and speak with the Public Health Inspector. Further general information: http://www.hkpr.on.ca/InfoSet/Environments.aspx

First, you should only be testing 'treated' water intended for drinking. Water taken directly from any lake (surface source) without using an approved 'treatment process' is not considered potable (safe to drink). Testing untreated lake water will not be conclusive - if it passes one day it may fail the next, as the water quality changes (such as from passing geese, dogs near the beach, and water currents/levels, etc.)

A 2012 study[1] asked a simple question "Why do Canadians get sick from drinking water?" They found that people did not:

- understand their water supply system
- recognize warning signs of issues, internal or external to the system
- considered changes in their system or those around their cottage
- seek help if they had concerns
- put resources towards addressing water supply issues

It's important for you to understand your cottage water system and its potential weaknesses.

Common Issues

At Kennisis, the most common water born health concerns are either caused by bacteria or pathogens (in our cottage environment, the most likely pathogens are fecal matter/ excrement).

Wells

Water from a well should be tested quarterly. Periodically, chlorination is required to purify the source well and the cottage plumbing system. Drain this water to the outside (not the septic) and where it will not flow directly into the lake.

[1] *Allen, M., Edberg, S., Clancy J., & Hrudey, S. (2012). Drinking Water Microbial Myths – A Primer for Utility Managers, Engineers, & Non- Microbiologists. Canadian Water and Wastewater Association National Conference, Kelowna, British Columbia, October 21-24, 2012.

The following link provides a step by step process for decontaminating a well:

http://www.eohu.ca/_files/resources/resource1310.pdf

Wells must be protected from surface water runoff and a properly working system will not contain any pathogens (fecal count = 0).

What should you do if your well water is not safe to drink:

http://www.hkpr.on.ca/InfoSet/Environments/WellWater/DrinkingWaterSafety.aspx

Surface Water - Issues

Bacteria / Virus

Bacteria and viruses in lake water are often treated with Ultra Violet (UV) light. Water moving past the UV light is rendered safe to drink.

Turbidity (silt or algae) can make the UV treatment system less effective, therefore a physical filter is first used to remove silt/algae (experts recommend a five-micron sediment filter).

A common problem with using UV is that it does not protect against bacterial growth between the UV treatment chamber and the tap. It is therefore necessary to 'decontaminate' the plumbing system from time to time. Chlorination (or Hydrogen Peroxide) may be added to purify the plumbing system. On completion of the purifying process, purge the chlorine or peroxide containing water to the outside (not the septic) and not directly into the lake.

Pathogens

Giardia or Cryptosporidium are gut wrenching protozoan cysts that can be best removed with either a 1 micron (or less) filter, UV system or reverse osmosis. No amounts of Pathogens are considered safe to drink so if your water test from the tap comes back with a fecal count, you have a serious problem.

Question	Answer	Comments/Treatment
What are the most common risks to drinking lake water?	We face three common pathogens: **Bacteria** - micro-organisms (E. coli think Walkerton). **Protozoa** - only survive outside the body in the form of a cyst or oocyst, which act like a cocoon protecting the Protozoa from water treatment. Prevalent in water are Giardia (beaver fever) **Viruses** are the smallest water-borne pathogens. Rotavirus and Hepatitis-A are examples.	Chemical contamination is not considered a significant risk at Kennisis. Turbidity, Skunky Taste - and Chemical Improvements can be made with filters such as Activated Carbon, however these devices do not disinfect. See below for treatment options
What should I do to treat the water?	Any solution needs to consider all three risks: Bacteria, Protozoa and Viruses:	There are a variety of commercial water purification system, common solutions include:
	Bacteria	Chlorination and Ultraviolet Irradiation (UV) are a common method of handling Bacteria
	Protozoa	Ceramic Filters Ultraviolet Irradiation (UV) No treatment required for properly working well.
	Viruses	Ultraviolet Irradiation (UV) and some very fine filters. Chlorination

Water related illness - what are the symptoms?	Symptoms of water-borne illness often include cramps, diarrhea, vomiting, muscle aches, weight loss, fever and chills. Infants, children, the elderly and people with weakened immune systems are the most severely affected. Skin rashes/vomiting/diarrhea after swimming can be a warning sign of an issue with a nearby septic.	Severe cases can result in kidney failure, long-term illness and even death. Fecal matter from Geese may be an issue near lawns as they attract geese. Common swimmers itch (not a potable water issue) can be a swimming issue.
What are common Issues to Watch for with **UV Treatment?**	Power outages disable UV systems. Using the water when the power is out (such as flushing a toilet) can contaminate pipes (see plumbing decontamination)	Short power outages of less than one second may disable recent models of UV controllers (they stay off and require manual restart). A small UPS (uninterruptable power supply) solves this problem.
What are common Issues with **Reverse Osmosis Treatment?**	The tank that stores the treated water may become contaminated over time.	Follow manufactures cleaning instructions
What are common issues with **wells?**	Surface water draining into the well from above or fractures in the rock (and after flooding) Insufficient testing	Landscape to divert water and prevent drainage into the well. How well is your well article
Are leaky septic tanks a problem for drinking water	All septic tanks need to be in working order.	Since we assume the surface water may contain pathogens, you must treat lake water appropriately as already described.
Are leaky septic tanks a problem for swimming	All septic tanks need to be in working order.	If your septic system is not in perfect order or if it has not been pumped within the last 3-5 years, get it attended to.
I suspect my neighbours septic is not in good condition - what do I do?	All septic tanks need to be in working order.	If your suspect your neighbor's septic system is not in perfect order or if it has not been pumped within the last 3-5 years, talk to them about getting it attended to noting that our lake water and drinking water health depends on regular septic maintenance. If that does not resolve the problem you may wish to contact the Municipality of Dysart.