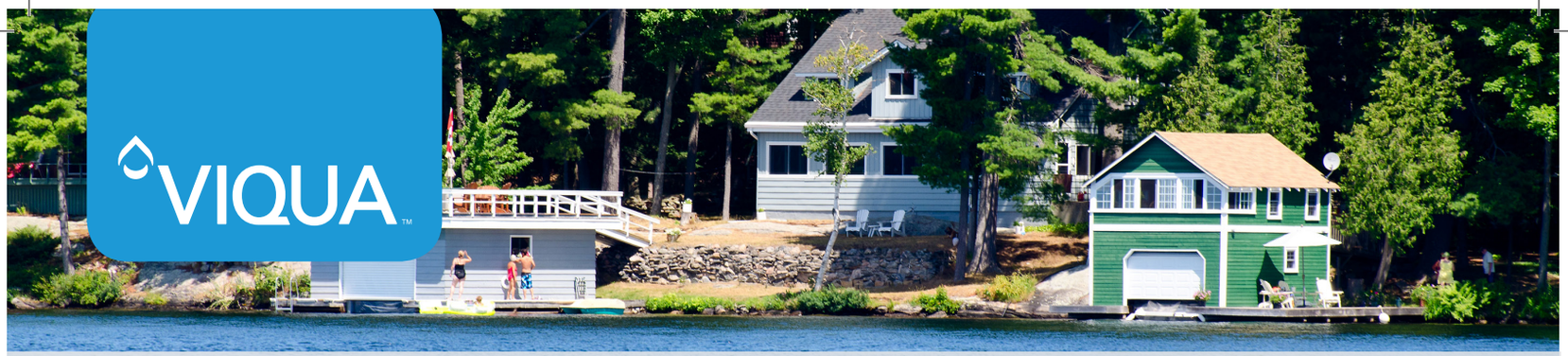


Ditch the Bottle

Wouldn't it be great if you could just **drink the lake water at your cottage**, rather than haul around cases of bottled water or huge water jugs? **Well, with the right water treatment system, you could!**

Surface water sources including lake, ponds, or springs have naturally occurring but mostly harmless contaminants like **tannins and sediment.** These will affect the taste, colour, and odour of the water, and typically, that's what keeps you from even wanting to drink water from the lake. In most cases, this is easily taken care of with basic filtration. And it's easy to tell if it's working, because you'll have clear, great tasting water.

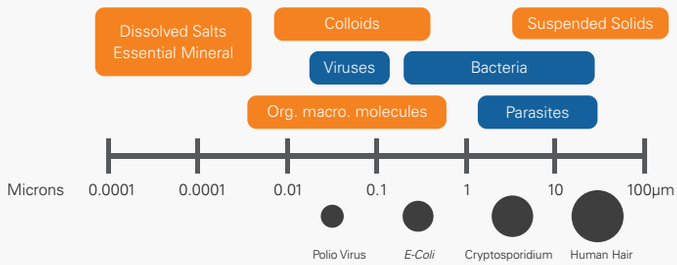
The more serious concerns are microbiological contaminants, like **bacteria and protozoan cysts,** that can actually make you sick. You won't know if your water is contaminated by these microbes, though, because you can't see, smell, or taste them. So it's important you understand how a water treatment system works so you can be confident your water is properly disinfected.

Let's take a look how a complete water treatment system can take care of all these issues.

Filtration: If your water is murky, that probably means it has high **turbidity.** The more turbid your lake water is the murkier it may appear. Further from the shore, the turbidity is more likely to be caused by phytoplankton. But as you get closer to the shoreline, where your pump is probably located, then the water could also carry **clay or silt.** So you'll want a good water filtration system.

Filtration is exactly what it sounds like - water goes through a porous material that catches and removes particles in the water. The pore size of the filter will determine what gets caught and what's allowed to pass through.

A sediment filter is often the first stage of water treatment, to trap the larger particles in the water, and can be followed by finer filters to remove smaller contaminants. Filters are rated on pore size, which is typically measured in microns (µ). The smaller the pore size, the smaller the particles are that can be trapped. But that can also slow the flow of water, so keep that in mind.



Filter pore sizes in microns represented by marks on the line. Round shapes shows the relative sizes of impurities. Not to scale, only to give idea of size of filter pores and impurities.

Adsorption: In the simplest terms, this is when contaminants are attracted to and attach themselves to an adsorbent material, like activated carbon. This process is excellent to remove **organic chemicals, like tannins and hydrocarbons** (think gasoline). Tannins are produced by the natural decay of leaves, and will give your lake water a slight yellow tinge like a weak tea. They can also make the water taste bitter and/or have a musty, earthy smell.**

If your lake allows motor craft, you'll want to have a carbon filter to treat for hydrocarbons. But quality matters. Some carbon filters perform much better than others, and performance is determined by the amount and the type of carbon, the way the filter is designed, and how long the water will be in contact with the filter.

Always check the manufacturer's specifications or check for a third party certification like NSF (www.nsf.org).

The down side of activated carbon, though, is that it can be a great home for bacteria, so you should make sure a carbon filter is followed by disinfection.

Disinfection: The goal of disinfection is to destroy or inactivate disease-causing microbes. Disinfection techniques are either physical, like exposure to ultraviolet (UV) light, or chemical, like chlorine, ozone, or hydrogen peroxide. When it comes to surface water, you need to choose a disinfection solution that treats for **protozoan cysts.** Ever hear of Beaver Fever? That nasty infection can come about when Giardia, found in the waste of animals, washes into surface water and is unknowingly consumed. UV is extremely effective against both **Giardia and Cryptosporidium**, as well as a wide range of harmful bacteria.

UV disinfection is very simple. UVC light passes through the water as it flows through a stainless steel chamber. Any microbes in the water will absorb the UVC rays, which destroys their DNA. With mangled DNA, the microbes can't reproduce, so they can't cause infection. The real beauty of UV treatment, besides how effective it is, is that it adds no chemicals to the water.

These three technologies – filtration, adsorption, and disinfection – can be combined in one easy-to-install system like the IHS12-D4 shown here.

- Takes minimal space (approx. dimensions 25"x 12"x 28")
- Uses little electricity (about the same as a 40W light bulb)
- Treats water at every tap

What do you need to do to keep a system like the IHS12-D4 performing at its best? Maintenance is fairly minimal, really. You'll need to replace the sediment and carbon filter cartridges fairly regularly, because they'll clog over time. How often you need to change the filters will depend on how "dirty" the lake water is to begin with, and how much time you spend at the cottage and how much water you run while there. With daily, year-round use, the average filter cartridge lasts 3-6 months. So you should make it a habit to check and possibly replace the cartridges at the start of each cottage season.

Maintenance Requirements: The UV lamp is designed to provide full disinfection for 9000 hours of constant running time (about a year). But again, you're probably only running the UV system during the months you have your cottage open, and turning it off when you close up for the winter. So you might be able to change the UV lamp about every third cottage season. It's very important to note, though, that just because your UV lamp is "lit" after that time doesn't mean it's disinfecting the water. So be sure to keep a good maintenance record and don't run the lamp for more than 9000 hours. The IHS12-D4 comes equipped with a countdown timer to let you know for sure when it is time to change the lamp.

When opening your cottage each year, you should make a habit of cleaning the quartz sleeve before starting up the UV system again. The sleeve will need to be replaced in time, but could last as many as four or more seasons as long as you keep it clean.

Maintaining your water treatment system adds only a few steps to your cottage opening and closing routines, and can be completed in as little as 30 minutes. In the long run, you'll save time and money and forget the worry and the hassle of lugging bottled water.

** *If your lake water is particularly high in tannins, you may need anion exchange. Talk to a water treatment professional if you're not sure what's best for your water.*

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