Making Water Safe to Drink

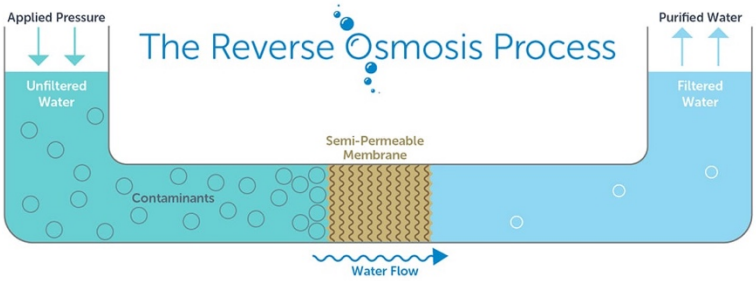
Hopefully by now you have come to realize that it really is a bad idea to drink Pete's Lake water without treating it first. Fortunately, according to our previous survey, 90% of our membership had already figured that out – to a greater or lesser extent – by or before 2014. But the big question is: which treatments are effective for making water safer, and which only make it clearer or better tasting?

Remember: You cannot tell if your water is safe by how it looks, smells or tastes!

Boiling

- The simplest completely effective method.
- If you don't mind the "chewables" you don't even need to prefilter it!
- Bring the water to a rolling boil; boil vigorously for at least one full minute; water is then ready to use.
- This treatment should be more than enough to kill parasites, bacteria and viruses.

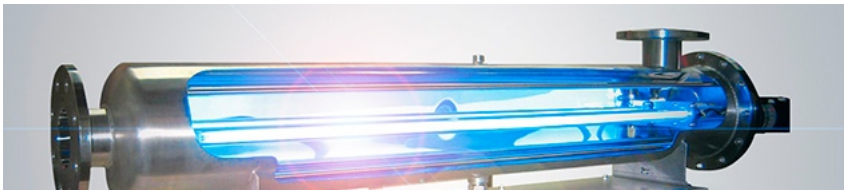
Reverse Osmosis (RO)



- Another completely effective method to remove parasites, bacteria and viruses.
- The RO filtration membranes have pores so small that they cannot be seen even with scanning electron microscopy (SEM). That means that they are smaller than 0.01 micron (1/100 of a micron) or less than ½ the size of a virus particle.

Ultraviolet Light Treatment

- Effective at killing parasites, bacteria and viruses in clear water (not cloudy or coloured) with adequate dosage of 40 mJ/cm.



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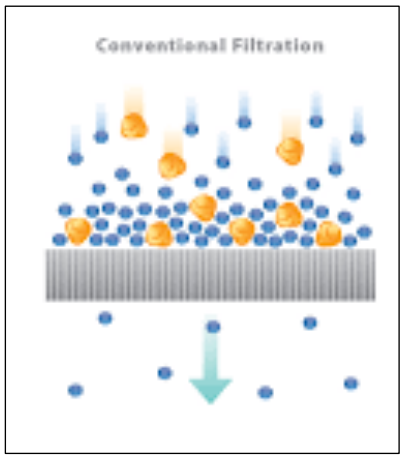
Chlorination

- Kills bacteria and viruses except norovirus but is not very effective against parasites.
- If possible, filter the water before treatment to reduce by-products (chlorinated hydrocarbons).
- Add 2 drops of unscented bleach (sodium hypochlorite 6%) to each 1 liter of water.
- Double the amount of bleach if the water is cloudy, colored, or very cold.
- Stir and let stand for 30 minutes.
- The water should have a slight chlorine odor. If it doesn't, repeat the dosage and let stand for another 15 minutes before use.
- Chlorine odour and taste will fade over a few hours.



Ultrafiltration (UF)

- Pore size 0.01 micron to 0.1 micron.
- Will remove parasites and bacteria, but not virus.

Microfiltration

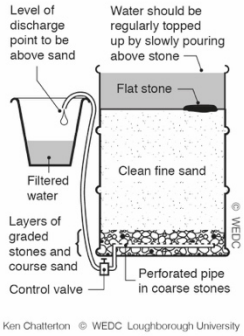
- Pore size 0.1 micron to 1 micron.
- Ceramic filters are in this category.
- Will remove parasites and reduce the number of bacteria, but viruses and some bacteria will get through.
- Filters with added colloidal silver will also reduce growth of any trapped bacteria.

"Nominal" 1 micron filters and carbon filters

- Countertop and pitcher style "purifiers" are generally in this category. They may help to remove various chemical contaminants from water, but they do not help make the water microbiologically safe.
- Some pores are larger than 1 micron so even some parasites can get through.
- Tests have shown that bacteria can grow inside these filters and actually increase the contamination of the water, so no filter of "nominal" 1 micron or larger pore size should be used as the final stage of water treatment.

Sediment filters

- Sediment filters are designed to remove particulate matter from water: things like sand, dirt, clumps of algae, small critters and the like. Depending on the design and type, effective pore size may be anywhere from 5 to 50 microns. Most viruses, bacteria and parasites will pass through these filters.



Treatment	What does the treatment remove or kill?			
	Particulates	***Giardia & Crypto***	***Bacteria***	***Viruses***
Boiling	✗*no*	✔*yes*	✔*yes*	✔*yes*
Reverse Osmosis	*Prefiltration required*	✔*yes*	✔*yes*	✔*yes*
Ultraviolet light	*Prefiltration required*	✔*yes*	✔*yes*	✔*yes*
Chlorination	*Prefiltration advised*	✗*no*	✔*yes*	✔*yes except* ✗*norovirus*
Ultrafiltration	*Prefiltration advised*	✔*yes*	?*most*	?*some*
Microfiltration	*Prefiltration advised*	✔*yes*	?*most*	✗*no*
"Nominal" filter	*Prefiltration advised*	?*maybe*	✗*no*	✗*no*
Carbon filter	*Prefiltration advised*	?*maybe*	✗*no*	✗*no*
Sediment filter	✔*yes*	?*some*	✗*no*	✗*no*

Coming soon:
Drinking Water Safety Part 7: Community Water Treatment

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