**WATER PURIFICATION METHODS**

**By Gemie Martin**

The Church website suggests a two-step process for treating water. It must first be clarified (the debris must be filtered out) before it can be disinfected. See www.providentliving.org for more information.

There are several products that can be used to purify water. The best will kill bacteria, viruses, protozoa, and cysts in contaminated water. Read the packaging. Keep in mind that only reverse osmosis filter types can remove all chemicals. In our day and age where many water sources have been contaminated by industrial wastes, this is an important consideration. These types of filters are expensive.

 **Boiling** may not be your best option for purifying your water. (It may not be an option at all). Bring water to rolling boil for 3-5 minutes. In higher elevations where water boils at a lower temperature, boil for a longer time. NOTE: These heating methods are not sufficient to kill cryptosporidium a harmful microorganism which causes diarrhea

**Pasteurization** is now also being suggested. A WAPI (a tiny to let you know when the water has reached the 149° necessary to kill most organisms), can be obtained through [www.sunoven.com](http://www.sunoven.com) or [www.solarcookers.org](http://www.solarcookers.org). These are fairly inexpensive and very tiny. They can be reused. You can find out more information online along with instructions to make your own.

**Chlorine Dioxide** kills nearly all organisms including cryptosporidium. It takes four hours to work. It comes in different forms. Katadyn makes the Micropur tablets. They can be purchased from Emergency Essentials for about $9.00 for 20 tablets. Aquamira (chlorine dioxide drops or liquid can also be purchased from Amazon.com. Chlorine Dioxide is very toxic if ingested so care must be taken to keep it (and the water as it is being treated) away from children.

**Chlorine** (sodium hypochlorite—household bleach) kills most organisms. The downside to chlorine is that it will bleach your clothing if it comes in contact. My research tells me that it is not effective at killing giardia or cryptosporidium.

**UV Light** can be used to inactivate organisms. The SteriPEN from Emergency Essentials is such a devise. It will inactivate all organisms including giardia and cryptosporidium. The down side is that the water needs to be very clear or the light will not be able to get to all the microorganisms. The upside is that it is very small and can easily fit into your 72 hour kits.

**The MIOX method** has been used by the military and was used to purify water after Hurricane Katrina. It uses salt to make a powerful dose of mixed oxidants which are then added to untreated water. The mixed oxidants inactivate all organisms including giardia and cryptosporidium. MIOX units are available online through E-bay and other sources. They are very compact and work with just camera batteries and salt.

**Filters** can be the most comprehensive method for purifying water. They can reduce some harmful chemicals as well as organisms. You should look for one that can filter to 0.2 microns. The Katadyn Combi uses two types of filters. The 0.2 micron ceramic filter removes bacteria and protozoa including giardia and cryptosporidium. The carbon filter reduces chemicals and bad taste. It is fairly expensive at around $220.00. It can be purchased at sporting goods stores. It is 12” tall and weighs 21 ounces.

The Church distribution store sells a Seychelle water filtration bottle (a sport-type bottle that provides filtration and drinking from the same bottle). At www.providentliving.org there is a link to the online store. Katadyn also makes a similar one that can also be purchased at sporting goods stores.

The LifeStraw Personal Water Filter can filter down to 0.2 microns. These would work well for each individual back pack. I got one recently from Amazon for about $20.00. They do not remove chemical contaminants

**Note**: If your water has been sitting undisturbed for a time if will taste “flat.” This means that some oxygen has escaped from it. It is easy to re-oxygenate by pouring it from one container to another.