Comparison of Water purification Methods:
These eliminate protozoa (parasites), viruses, bacteria & particulate matter.
None of these methods remove chemical contamination ie motor boat fuel, mercury.
None of these methods remove unwanted minerals.
For all methods it is important to read and follow manufacturer’s instructions very carefully. You need to know what could be in the water in order to choose an appropriate method(s).

1 Boil water for 1 minute (high altitude 3 minutes) (CDC)
Works for protozoa, viruses, bacteria.
Works for particulate water.
Most effective on all pathogens but does not remove chemical contamination.

2 Filters:
Filter water with Platypus GravityWorks filter 4L $140
Works for protozoa, some bacteria, particulate matter.
Does not work for viruses. Particles may clog filters – need to backflush.
Filter life about 1500 litres or 375 4L bags. New filters cost about $55.
Do not freeze or drop filter.
Filter pore size .2 microns

Filters requiring pumping - ceramic and others (various)
Works for protozoa, some bacteria
Does not work for viruses, clogged by particulate water.
Pore size varies

Lifestraw $26
Works for protozoa, some bacteria
Does not work for viruses, clogged by particulate water.
Filter pore size .02 microns.

3 Ultraviolet Light treatment:
UV Steripen adventurer and pre-filter $105 + $25
Works for protozoa, viruses, bacteria
Does not work well with water containing particulate matter.
High quality disposable batteries about 50 uses.
High quality rechargeable batteries about 30 uses.
Lamp life about 8000 L.
MEC will not replace the lamp although manufacturer is able to.
This can freeze but must be warmed before being used.

4 Chlorination (or iodine)
Pristine water tablets or drops require long wait times. Chlorine Dioxide ClO2 $22
Works for viruses, bacteria
Low to moderate effectiveness for removing giardia.
Does not work with particulate water
**Aquatabs** $20  
Works for viruses, bacteria  
Does not work for protozoa or particulate water

**Javex** (chlorine) or iodine inexpensive  
Works for viruses, bacteria  
Does not work for protozoa

**5 Distillation** and **reverse osmosis** are other water treatment methods not used in the backcountry. They can remove chemical contaminants.

**Examples of Water Pathogens**  
Protozoa: giardia and cryptosporidium are 4-6 microns in diameter so a 1 micron pore gets rid of them.  
Bacteria: E. coli, salmonella, shigella, cholera .2 to .5 microns so a .2 micron pore gets rid of some. These are seen more often from agriculture or after storms/floods.  
Viruses: Poliovirus is .027 microns in diameter, hepatitis, rotovirus, noroviruses (norwalk) about .004 microns so a .2 micron pore does not get rid of them. These are more common in an urban or busy setting.  
To remove viruses use chemicals (chlorine), ultraviolet light or boil water.  
Particulate matter: bugs, sticks, dirt

For a comparison of backcountry treatment methods see:  
Combining purification methods results in greater effectiveness. (ie filter and chlorine or filter and UV)

**Waste Disposal**  
Human waste:  
Bury human waste at least 200 feet away from natural waters and at least 8 inches deep. (CDC) This could be a “cat hole” or a “ditch” for a group. Some sites have thunder boxes or an outhouse. Do not leave pads, tampons, etc. Seal in a Ziploc bag & place in garbage barrel.  
Toilet paper can be collected and burned daily in a paper bag.  
A detailed book on this topic is called “How to shit in the woods”.  
Food waste:  
Avoid food waste by planning well. Use the “no leftover” rule.  
Extra food and other smelly items can be sealed in Ziploc bags in a barrel or some can be burned. Leave no trace: Pack in, pack out.

**Hygiene:**  
Swim or use a CamelBak as a “shower”. If you are particular you can use filtered water. Keep soap/shampoo away from water sources. Use biodegradable & unscented products.
Handwashing Stations:
As well as getting ill from the water, what is just as common is illness transmitted by fecal oral route (person to person) or by food contamination. You need handwashing stations near the outhouse/thunder box and one near the kitchen. As the group size increases this becomes even more important. Clean water and soap. Hand sanitizer is a bonus.

Washing Dishes
Recommended for larger groups:
Three dish pans (or pots).
(Pans should not be used with unfiltered water to wash clothes etc.)
1: Soap & filtered/boiled water
2: Rinse (filtered/boiled water)
3: Disinfect with 6-7 drops Javex (or Borax) added to dishpan of filtered/boiled water. (Int.org)
Air dry. Perhaps use a net bag. Avoid dirty tea towels.
Strain dishwater (screen) & seal food scraps in garbage or burn. Water needs to be dumped away from camp and 200+ ft. away from water sources.

Lesson by Karen H