

Troop 414 Backcountry Water Purification

Troop 414 uses a multiple barrier concept in order to assure safe drinking water for Scouts during backcountry adventures. A multiple barrier concept provides additional safety barriers and assures safe, contaminant-free, drinking water.

Introduction:

Backcountry water sources (rivers, lakes, and streams) sometimes harbor microscopic pathogens (disease-causing agents), viruses, and/or pesticides and chemicals. The microorganisms or viruses get there when animal or human feces taint the water. They can give you diarrhea, abdominal cramps, nausea, weight loss and fatigue with symptoms lasting between 4 and 6 weeks or longer (like when drinking tap water in Mexico).

Troop Purification Process:

1. Filtration
2. Activated Carbon Treatment
3. Ultraviolet (UV) light sterilization

Equipment:

1. Katadyn Hiker Pro water filter (filtration & activated carbon)
2. Steripen UV light treatment (UV sterilization)

Purification Process (What it does)

1. Filtration – Filters particulate matter & microorganisms (not viruses)

The glass fiber filter physically removes particles (dirt & mud), protozoa, and bacteria down to 0.3 microns in size, including Giardia, salmonella, cryptosporidium and others.

2. Activated Carbon – Removes chemicals & improves taste

Activated carbon filters remove/reduce many volatile organic chemicals, pesticides and herbicides, as well as chlorine, benzene, trihalomethane compounds, radon gas, hydrogen sulfide, and mercury (moderately effective). It also reduces odor, color, and taste problems.

3. Ultraviolet Light – Kills microorganisms & viruses

Ultraviolet (UV) light is at the invisible, violet end of the light spectrum. Even though we can't see UV light, we are exposed to UV rays from all light sources, including the sun. Ultraviolet water purification lamps produce UV-C or "germicidal UV," radiation of much greater intensity than sunlight. When harmful microbes are exposed to the UV rays, their nucleic acid absorbs the UV energy, which then scrambles the DNA structure of the organism. The cell is rendered sterile and can no longer reproduce. The cell is now considered dead and is no longer a threat. There are no microorganisms known to be resistant to UV, unlike chlorination. UV is known to be highly effective against bacteria, viruses, algae, molds and yeasts, and disease causing oocysts like cryptosporidium and giardia.