

# Water, Water everywhere or is there?

## A. Why is water so important to us?

1. Our body is 60-70% water – about 14 gallons
2. We lose about 3 quarts a day in normal conditions, more in excessive heat and exertions.
3. We need to replace about 1 gallon of water per day. Less if we do nothing but lie around and more if we are up and going all day in the heat.
4. Cooking, cleaning, Laundry, flushing toilets, personal hygiene, pets, gardens, first aid and more.
5. CERT training – If you are thirsty you are already in trouble but you have time.
6. Don't ration out your water, better to store it in your stomach than your canteen
7. 3 minutes without air, 3 hours without shelter, 3 days without water and 3 weeks without food.
8. How much water does the normal person use? See chart

## B. Why store water?

1. We have been commanded by the prophets to do it.
2. Natural disasters – Tornados, Floods, Earthquakes, ice storms and more
3. Water pipelines break and need repair
4. Water treatment plant fails
5. No electricity for water pumps to work
6. Contaminations from some source – water boiling warnings – average 1 a week in USA and Canada.
7. Civil Unrest
8. Dam breaks – accidental or terrorism – Just heard that the Lewisville lake Dam is in need of repairs 100-200 million dollars worth.
9. Drought <http://droughtmonitor.unl.edu/>
  - a. Show charts and talk about them. Denton/Collin county 2 down last 2 square ones. We are in a drought now and have been for several years.
  - b. Talk about aquifer depletion Texas coop power August 2012 issue
    1. Last big drought in Texas was the 1940-1950's
    2. Surface water, meaning creeks, rivers and lakes, is considered a public resource commonly owned by the people of Texas.
    3. Groundwater, that is all water that you can't see below the surface of the Earth is regarded as a mineral right and is owned by the property owner. This means you could drill a well and deplete all the water but because the water is in Aquifers like the Ogallala you not only drain your water but your neighbors as well. This is what Ozarka does to get its water in Texas.
    4. Show the Ogallala aquifer picture.
    5. Droughts in the Midwest farming country cause them to use it more for irrigation than normal.

6. The bottom line is that our population here in Texas is expected to almost double in the next 50 years or so, and we have already given permission for more water to be withdrawn from many of our rivers and lakes than is actually in them.
  7. There is some discussion about changing these laws so if you are thinking about getting rainwater collection systems do it soon.
- c. China, Russia and others have had severe droughts since 2010
  - d. Some people think it may start a war for water and we have the most per capita useable other than a frozen lake in Siberia.

## C. How much to store?

1. Church did say 1 gallon per person per day for a minimum of 2 weeks. When I went to check that they had no specific amounts listed now at providentliving.org. I drink at least a gallon of water per day so I know that I have to store more than 1 gallon per day. Look at your water usage to get an idea. Most sites still recommending a gallon a day per person.
2. FEMA is now saying 2 weeks instead of 72 hours for taking care of your self – food and water.
3. Do you drink bottled water? How much do you go thru in a week?
4. Do you have people in your family who won't drink water? Start getting them use to drinking water. You can store some Kool-Aid or other additives to get them to drink. But remember that anything other than water your kidneys treat as waste and have to work harder to get rid of.
5. Do you have a garden you need to water? Rainwater great for this.

## C. How Can we use less

1. Obviously some things we use water for will be cut down in an emergency – showers – cleaning may be 2 areas we can cut down on but depending on how long we are without water we may need to do some of those things
2. If it's yellow let it mellow; if its brown flush it down
3. From [Disasterguy.com](http://Disasterguy.com) - Use a [bug sprayer](#) that you purchase and mark for shower only use. Fill with hot water, rinse, lather and rinse again. 2 gallons will do it.
4. Sponge baths take less water
5. Set up a [toilet in a 5 gallon bucket](#) with either special bags or double layer heavy garbage bags. [Enzymes](#) are cheap and can be found in the RV section at Wal-Mart as well as most camping stores and EP stores.
6. Have some paper products on hand so that you don't have to waste water cleaning dishes

## D. What to store in and How to store it

1. Use ONLY food grade containers – if food came in it to begin with it is safe.
2. PETE, PET, or HDPE should be on it somewhere [High Density Polyethylen, Polyethylene terephthalate ]
3. <http://www.containerandpackaging.com/info/plasticology.asp> Gives info on each plastic abbreviation
4. Don't use milk jugs. They won't last and will leak.
5. Examples – 5 gallon, 7 gallon, juice bottle, 55 gallon, bottled water, 2 liter soda bottles, water bob, Boxed Mylar bags
6. Don't store a bunch of 55 gallon barrels on the same side of your garage it will crack you foundation. Water is Heavy!
7. Water from a chlorinated municipal water supply does not need further treatment when stored in clean, food-grade containers. Lds.org
8. Non-chlorinated water should be treated with bleach. Add 8 drops of liquid household chlorine bleach (5 to 6% sodium hypochlorite) for every 4 liters (one gallon) of water. Only household bleach without thickeners, scents, or additives should be used. Lds.org
9. Bleach has a shelf life of 6-9 months depending on the temp it is stored. Higher the temp shorter the life. Powdered bleach will last longer.
10. Light is the enemy of water as it encourages the growth of living things.
11. You also don't want it to get too hot or frozen.
12. Containers should be emptied and refilled regularly. I have read everything from 6 months to 5 years on this.
13. Store where a possible leak will not cause damage in your home.
14. The flat taste of stored water can be improved by pouring it back and forth between two containers before use. This puts O2 back in it.
15. Of course you can buy bottled water, you can fill from your tap and you can collect rainwater.

## E. Rainwater Collection

1. Texas offers a sales tax exemption on the purchase of rainwater harvesting equipment. Both Texas and Ohio allow the practice even for potable purposes.
2. Most Western states make it illegal to collect rainwater
3. Due to leaching of toxins, composite or asphalt shingles are not appropriate for potable systems, but can be used to collect water for irrigation, flush toilets, Etc.
4. A 2,000 square foot roof could produce 1,200 gallons of water that could potentially be collected.
5. Show picture pictures of bought and homemade systems- 4 slides

## F. Where to get water when the tap is dry

1. Hot water heater
2. Swimming pool
3. Hot tubs
4. Fountains
5. Ponds and lakes
6. Rivers, streams and creeks
7. Condensation – solar still, Dew, etc
8. Lowland catches – dig a hole and wait for it to fill in.
9. Snow or ice storms
10. Some plants or trees – prickly pear Cactus, thistles, walnut, maple, birch or hickory trees
11. Commercial buildings using a Sillcock key
12. What things to worry about from these other sources-
  - a. Pesticides, herbicides, engine oil,
  - b. fecal matter, cleaning solutions chemicals,
  - c. bacteria, virus, insect eggs or larvae, worms,
  - d. Dirt, plant material, heavy metals and other toxic run off items.
  - e. Most of these micro-organisms, organisms and pollutants can be eliminated with filtering or boiling.
  - f. **Organisms size chart**

## G. Water purification

1. Water purification is a process in which all types of impurities, contaminants and pollutants are removed from the water.
2. Most purification processes involve multiple steps, and especially when water purifying is done in emergency conditions.
3. Contaminated water can cause severe problems including
  - a. Severe and prolonged diarrhea
  - b. Diseases like cholera and typhoid
  - c. Parasites in your digestive system
  - d. Leeches
  - e. Infections
4. **Remember that water in a mountain stream can be contaminated just as much as city sources. There are critters up there that don't care where they do their business!**
5. You may have to use more than one method to purify your water.
6. But all methods would require you to filter out the larger impurities before proceeding.
7. You may also want to let the water set so that any dirt or particles that did not filter out will settle to the bottom.
8. **1000 coffee filters** at Sams for \$6. These are great filters for smaller amounts

9. You should always purify any water that does not come from a water treatment plant.
10. You will get all kinds of different opinions on what to do and not to do. Common sense and experience will get you through most of the time.
11. When in doubt purify, it is not worth getting sick over.

## H. Filtration

1. Can use **cheesecloth, coffee filters** or other material to filter out large stuff.
2. You can buy a filter system. Show **Just water filter system.** Ceramic. Gravity fed.
3. Show **water bottle and water straws**
4. You can also make your own if you want. Lots of sources on the internet to show you how but basically a 2 bucket system where the top bucket has layers of gravel, sand and charcoal to filter out the impurities.
5. Most of these will last about 6 months before needing to be replaced.
6. **Pictures of homemade filtration systems**

## I. Boiling

1. You can boil water to kill everything in it. Just boil for 1-3 minutes. Remember the longer you boil the more water you lose.
2. Boiling does not kill Protozoan

## J. Heated rock boiling

1. If you don't have a container that will withstand the heat of boiling over the heat source; you can heat rocks and then place them in your container.
2. Continue until the water boils for about 5 minutes.

## K. Distillation

1. This uses the process of condensation to purify water. You boil water in a container and then let the steam or water vapor collect and fall into another container.
2. This not only kills all organisms because it has been boiled but removes salts and other impurities so it is the best option for sea water or if after boiling the water still tastes bad.
3. Never drink sea water, it will speed up dehydration
4. **Show picture.**

## L. SODIS –Solar disinfection

1. This method uses the UV rays of the sun to disinfect the water.
2. First filter the water
3. Put water in a smaller clear plastic bottle. 2 liters or less -I collected the **Gatorade bottles** because they are sturdier than water bottles.
4. Shake the bottle and then place in the sun. 6 hours of bright sunlight or 2 days if it is cloudy.

5. Being used in 3<sup>rd</sup> world countries now.
6. **Independence day** – he used galvanized steel that was wavy and built an A-frame for it to lean against then put the bottles filled with rainwater in them. His wife was dubious so he had the rainwater, the well water and the UV treated water all tested. Straight rainwater was worst, then the well water. The UV water was the purist.

## M. Solar Still

1. Device that allows the sun to heat up the soil and then for any moisture to condense and fall into a container.
2. **Show picture**
3. Dig a pit about 2-3 feet deep.
4. Put a container in the bottom.
5. Cover with a piece of plastic weigh down the edges with the extra dirt
6. Put a rock in the middle over the container
7. Some people put a tube from the container out of the plastic so you can suck out the water without disturbing your set up but will work either way.
8. Sunny days work faster and adding some vegetation to the pit will also help.
9. **Show plant condensation slide**

## N. Pasteurization

1. Louis Pasteur showed that bacteria are killed 149\* and that is how milk is pasteurized today.
2. So why do people boil water if they don't have to? Because they don't know when it hits 149\*.
3. **WAPI** or water Pasteurization indicator allows you to do that.
4. These are reusable and inexpensive. Good thing to have in a 72 hour kit as well as your food storage.
5. And if you are really adventurous you can find instructions on making them yourself.
6. **Show example and slide. Explain about the wax melting.**

## O. Chemical additives

1. The 2 most common chemical additives are bleach and iodine but there are a few others.
2. **Bleach** –
  - a. Never use bleach that has a scent added to it, it will make you sick
  - b. 8-16 drops per gallon and let sit for at least 30 minutes
  - c. There should be a slight bleach scent if not repeat process.
  - d. If you still don't get the bleach scent throw it out, it is too contaminated to use
  - e. Does not kill protozoa so can still make you sick.
3. **Iodine**
  - a. Read the label to see how to use it usually at least 30 minutes.
  - b. Light sensitive and must be stored in the dark.
  - c. It tastes bad.

- d. The water may still be dirty.
- e. Does not kill cryptosporidium. –protozoa that causes diarrhea
- f. Not good for people with thyroid problems or pregnant women to use this.

#### 4. Chlorine Dioxide or Aqua Mira

- a. This comes in 2 bottles that you mix together. I have seen it available for under \$15 to treat 60 gallons of water
  - b. Water treated will stay good for about 5 years.
  - c. No taste unlike the iodine
  - d. Does kill cryptosporidium
5. **Katadyn Micropur tablets** come individually wrapped and each one is good for 1 liter of water. Takes about 4 hours to work.
6. **Coleman Purification** tablets get at Walmart for about \$6 a package. 2 pills go in and wait 30 minutes then use the PA plus to get rid of the bad taste. Each is good for 1 quart or liter of water.
7. **Calcium Hypochlorite or pool shock treatment.**
- a. Dry 68% Calcium Hypochlorite Granules or pool shock
  - b. This is dangerous stuff and I would not recommend it. Storage and use.
  - c. Be sure you do a TON of research if you want to go this route

## P.UV water purification

1. This is device you can buy that will emit Ultra Violet light and destroy microorganisms.
2. No adding chemicals to affect taste or odor
3. Has a USB rechargeable battery and can be used multiple times
4. Steripen is one brand I found that will treat 16oz in 48 seconds or 33 oz in 90 seconds
5. It can be used up to 8,000 times
6. Found prices from about \$50 to \$100 for them online
7. This is meant for small amounts of water at one time.
8. Good for 72 hour kits.

#### 9. Show yours

## Q. Finish up

1. Water is vital for our survival
2. Learn how to store and purify water so your family will not suffer in hard times whether short or long term.
3. If you don't you will spend 90% of your time trying to find water for them. And that takes away from you ability to find food, shelter, make fire, etc.
4. Water is one of the cheapest things to put in your food storage but it does take a lot of space.