

SURVIVAL PAPER

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WATER, WATER EVERYWHERE

By Jim Jones

“Water, water everywhere and not a drop to drink” was the lament of the ancient mariner becalmed and thirsty in a sea of undrinkable saltwater. Today water comes from a faucet or is purchased in bottles, clean and (arguably) pure. But what if it doesn’t? Next to air, water is the most critical life sustaining substance. The human body can survive much, much longer without food than without water. In the long-term you can’t even produce and cook most foods without access to water. Your cleaning, decontamination, first aid, sanitation and fire control also depend on water. Wars have been fought over access to water sources and whole cultures have risen and fallen with the flow of rivers and springs. Water supplies are major targets for terrorists and are vulnerable to all manner of natural and manmade disaster. Not only will safe water be critical to your families survival it could be a more valuable trade commodity than food or medicine. The water pumps are the heart of urban/suburban civilization and without it they would die in a matter of days. Compared to water, oil is hardly significant. Truly he who controls the water controls life and he who has his own water is free.

Depending on age, health, and level of activity and environmental (e.g. temperature and humidity) the average person can only survive about three days without water. The average person under normal conditions requires at least one quart of drinking water per day. When reasonable sanitation and cooking needs are added, a half-gallon per day is a good rule of thumb for emergency storage. If you have elected to store quantities of dehydrated foods, you need to remember store more water for rehydration. For this article we will classify water as:

- **Stored Water:** This is drinkable water that is deliberately stored for emergency use.
- **Available Water:** This is water that may be in or near your home but is not generally thought of or stored for emergency uses.
- **Accessible Water:** Water that can be accessed or gathered for use in emergencies.

Use some common sense. During the Gulf War people suffocated to death in improperly used gas masks rather than breath air that *might* be contaminated. If you are very thirsty and have no prospect of safe water being available soon you should drink the safest water you have even if it's not 100% certified clean. Unless you *know* it's poisoned or contains a fatal contaminant do the best you can (if anything) to purify it and drink it. Never ration water. Water is better in the body than in the bottle. There is no long-term advantage to being thirsty. Yes, you may run out of *stored* water sooner but that water will be in your body doing its job. You should conserve the water stored in your. Obviously try to avoid sweating if possible and never mop it away. Do not consume caffeinated or alcoholic beverages that increase urination and actually take water out of the body.

Stored Water

While in theory you can never store too much water, it is heavy and takes up a lot of room. Sorry, there is no such thing as dehydrated water. If you anticipate that you will be staying at home and that your home will be safe from fire, floods, etc. then you can store your water there. If, however your home could be damaged or inaccessible you should consider storing water in a safer but reachable location. Consider whether you may need to carry your water. A 55-gallon drum of water in your basement would be of no use if you have to evacuate. Plastic containers that were designed to hold water, juice or soft drinks are good for storing water. Milk containers can be used but are flimsy and hard to get clean. Never use containers that originally help soaps, solvents, or other chemicals. Containers should be rinsed thoroughly with clean water and the soaked in a mild (10%) bleach solution and then. As soon as you dump the solution out fill the container with clean water and seal tightly. Most municipal waters can be stored without additional treatment. If you are storing well water or other water you are unsure of add 4 or 5 drops of household bleach to each gallon. Of course you may simply want to buy bottled water at the store. Five gallons of stored water per person should be sufficient for most basic emergencies.

If you have an early warning that there may be a water shortage you should collect as much water as possible while it is still flowing. Fill your bathtub, fill sinks, pans and other containers, fill your washing machine but do not add soap. Fill any children's wading pools and tote bins that may be available

Available Water

If you have failed to store enough water or you find yourself in a location where no stored water is available you may need to use water from other sources. Not all of these sources are drinkable but they may provide water for other needs. If you have your own well you have the water problem solved if you have a backup power supply for the pump. If not get one! The toilet flush tank (not the bowl) contains several gallons of clean drinkable water. Do not flush the toilet with this clean water! Scoop it out and use it for drinking and cooking. You can flush the toilet with used, dirty brown water from washing or with water that is unsafe for drinking anyway. Water Heater water. Turn off the main water valves and gas and drain the 20 to 60 gallons of good water from the tank. Water pipes in a building contain gallons of water after the supply has stopped. Turn off the main valve to prevent drain-back and contamination and drain the system from the lowest faucet. This is usually the laundry room sink.

Swimming pools and garden ponds can hold hundred of gallons of usable water. In fact they may be considered as family emergency water reservoirs. Properly maintained swimming pool water may be used for dinking and cooking but the chlorine content will effected the taste. Even a small pool will supply lots of water for cleaning and flushing. If left uncovered they can be contaminated with airborne biological, chemical and radioactive materials. Most biological contaminants can be killed through boiling (a rolling boil for 30 minuets). Nuclear fallout can be removed through filtration. Decorative garden ponds may contain debris, animal and bird feces etc. and would require filtration and bleach treatment or boiling before use

Sump water. Many homes have a sump pit and a sump pit in the basement. These function to pump away ground water seepage before it can flood the basement. Ground water is not well water and is often contaminated. A prudent homeowner would have a battery powered backup pump or a generator to assure that this pump will run during a power outage. Assuming that if your water city supply is gone so is your electricity you will need to pump or bail this water out regularly. This can be a supply of water for flushing, cleaning or watering plants. As a last resort you could filter, bleach or boil this water for drinking.

Accusable Water

Roof water. In the old days people had gutters running to rain barrels to gather water for home use. Large plantations had cisterns to collect rainwater in the wet months for use in the dry times. Rain on a house roof in one storm can provide enough water for weeks. Even dew and frost melting into the gutters can produce several quarts of water each morning. Consider having the necessary gutter piping to divert this into containers. The water will be contaminated but can be filtered, bleached or boiled for use and drinking.

Rivers and streams today are almost always contaminated. Even in wilderness area animal feces and carcasses upstream may polluted the seemingly clean water. Consider open stream and drainage ditches as a last resort. As is it can be used for watering plants and fire protection. If you have no other alternative you can filter beach or boil it for washing and drinking. Beware of water sources that have no plants growing near them, have odd smells or colorations, or near which you see dead animals. These sources may contain man-made or natural (e.g. arsenic,) contamination that cannot be easily removed.

Water from plants. Most plants transpire (sweat) water every day. Wrapping plastic bags around heavy hanging foliage will collect this water in the low corner of the bag



Wringing Water Out Of Mud

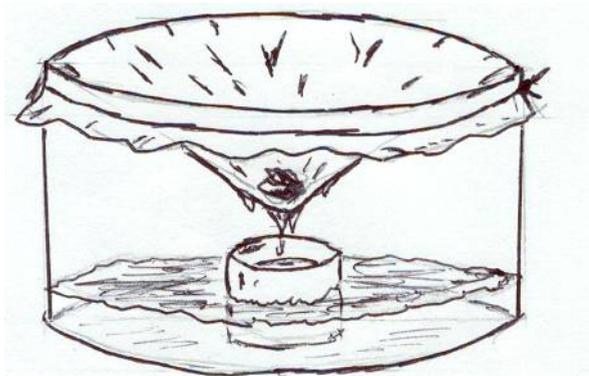
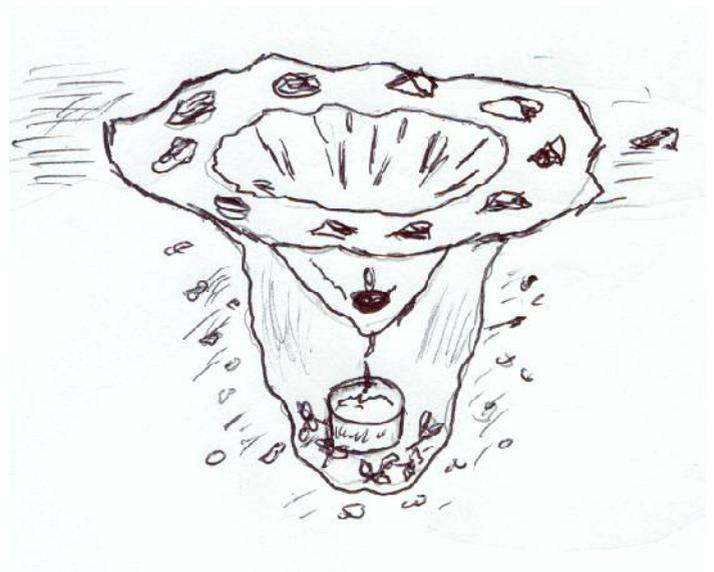
Moping up the morning dew from rocks, metal surfaces (e.g. cars, boats) etc. with sponges or rags and wringing it into a pan can gather a considerable amount of water. Water trapped in soil and mud can

be placed in cloth or a clean sock and squeezed out



. The so-called “desert still” was designed to distill small amounts of water from seemingly dry desert soil and cactus pieces in an emergency. This same system can be used to distill much more water from moist soil and foliage. A similar still can be constructed to render drinkable water from saltwater as illustrated below.

Right: “desert Still” consists of a hole about 15 to 20 inches deep and 18 to 24 inches in diameter. A water collection cup or pan is placed in the bottom along with any available plant material. A clear sheet of plastic is suspended with slack over the hole and held in place with rocks. A small rock is placed in the center to create a low center point. As the sun heats the hole water gathers on the inside of the plastic, runs down and drips into the cup. In the evening remove the cup of safe water



Left: A solar simple still made from a round pan and clear plastic place a weighted (so it won't float cup in the center and saltwater in the pan. The sun will distile the water into the cup without the salt.

Now that you have water you need to know how to filter it, purify it, and conserve it

Filtration

The filtration of visible (muddy, murky) gross contaminants can be accomplished using such items as coffee filters, clean cloth or clean sand. This does not make the water safe to drink. You must boil; treat the water before it is safe. Cartridge filters are

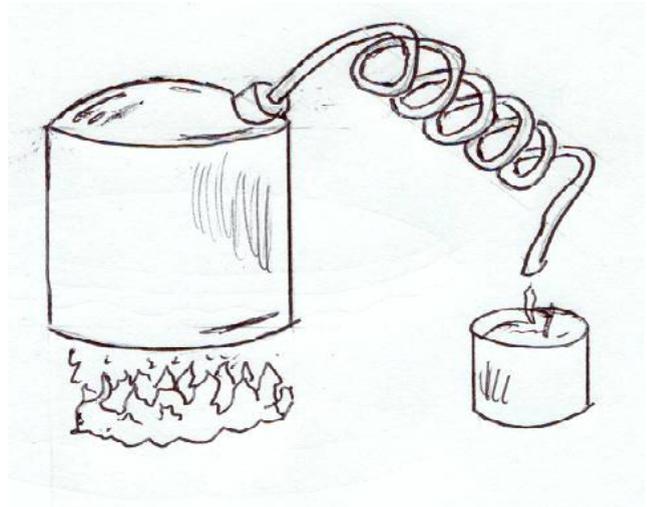
designed to remove virtually all-biological, chemical and particulate contamination from water. Most camping and outdoor sports stores sell these units for from \$30.00 to \$60.00. These units are portable and can filter hundreds of gallons of water per filter. You simply must have several of these

Distillation

Boiling water into steam and then condensing it into clean water provides water free of biological and particulate contaminants. Some volatile chemical contaminants can remain with the distilled water. Distilled water often tastes flat. Shaking it to aerate will restore a normal water taste. Stills can be improvised but having the components ready and tested is better yet.

A still system consists of:

1. heat sources such as a stove, or fire
2. A closed tank or pot to boil the contaminated water in
3. A long tube or coil to take the steam away and cool it
4. The tub can be cooled by air (coiling) or water. Wrap the coil in cloth kept wet
5. A container to catch the water



Treatment

When other methods are unavailable water can be made safe through boiling or treating with chemicals. Bringing water to a rolling boil for 3 to 5 minutes will kill all biological contaminants and drive off many volatile chemicals. Filtering it through a coffee filter will remove most particulates

In general 8 drops of household bleach will kill biological contaminants. 10 drops of tincture of iodine will do the job as well. You can use up to 10 drop if the water is severely polluted. Mix in the bleach or iodine and let it stand for an hour before drinking.

Water purification tablets are available from camping supply outlets for about \$5.00 for a 50-tablet bottle. These are very small bottles that can be carried in pockets and survival kits

Conservation

Water that is not safe to drink may be okay for washing cloths or watering plants. Water that has been used for washing or is from an unsafe source can still be used to flush the toilet. Think; Try not to use drinking water for anything but drinking, food washing, hand washing and medical care.

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