

WATER STORAGE AND PURIFICATION

Water storage is important. Having an ample supply of safe, clean water is a top priority in an emergency.

A normally active person needs to drink at least two quarts of water each day. Hot environments can double that amount. Children, nursing mothers and ill people will need even more. You will also need water for food preparation and hygiene. Store a total of at least one gallon per person, per day. You should store at least a two-week supply of water for each member of your family.

If supplies run low, never ration water. Drink the amount you need today, and try to find more for tomorrow. You can minimize the amount of water your body needs by reducing activity and staying cool.

Amount of Water to Store

Whereas a quart of water or other fluid daily will sustain life, according to the Department of Defense and the Office of Civil Defense, it is recommended that a gallon of water per day per person be stored for food preparation and drinking. A gallon provides added comfort and accommodates increased fluid needs at higher altitudes or warm climates. An additional one-half to 1 gallon per day is recommended for bathing and hygiene, and to wash dishes.

How much water should I store? The rule of thumb is to store at least one gallon per person per day for at least 3 days (for earthquake preparedness). That's 2 quarts for drinking and 2 quarts for food preparation and sanitation. A family of four should store a minimum of 12 gallons of water. Personally, I recommend at least a 10 day supply of water and a 30 day supply if possible.

Use the following guidelines when storing water:

1. Store drinking water in carefully cleaned, non-corrosive, tightly covered containers.
2. Store containers in a cool dark place. DO NOT store in direct sunlight. Polyethylene plastics (prepackaged milk and water bottles) are somewhat permeable to hydrocarbon vapors. Keep away from stored gasoline, kerosene, pesticides, or similar substances.
3. Stored tap water should be rotated every 6 months. Prepackaged bottled water should be rotated once a year. Check the pull date on the container. Be sure it didn't sit on the store's shelf for a year before you purchased it. Self Serve Bottled Water should be rotated once a year, as long as the water treatment process includes ozonation.
4. Rotate your stored water with the water you use on a regular basis. This practice helps insure you don't have water stored longer than one year.

Containers That Can be Used for Water Storage

Food-grade plastic or glass containers are suitable for storing water. One-, three- and five-gallon water containers can be purchased from most outdoor or hardware stores. Any plastic or glass container that previously held food or beverages such as 2-liter soda bottles or water, juice, punch or milk jugs, also may be used. Stainless steel can be used to store water which has not been or will not be treated with chlorine; chlorine is corrosive to most metals.

55 gal drums, designed specifically for water storage can be difficult to transport, if the need arises, but are of a tremendous value in an emergency. When looking for additional food grade containers, the bottom will be stamped with HDPE (High Density Polyethylene) and coded with the recycle symbol and a "2" inside. HDPE containers are FDA-approved for food. Containers without these designations aren't OK because of possible chemical interactions between the water and the plastic.

Clean used containers and lids with hot soapy water. Once the containers have been thoroughly cleaned, rinse them with water and sanitize the containers and lids by rinsing them with a solution of 1 tablespoon chlorine bleach per gallon of water. Leave the containers wet for two minutes, then rinse them again with water. Remember to remove the paper or plastic lid liners before washing the lids. It is very difficult to effectively remove all residue from many containers, so carefully clean hard-to-reach places like the handles of milk jugs. To sanitize stainless steel containers, place the container in boiling water for 10 minutes. Never use containers that previously held chemicals.

Do I Need to Treat Water?

Once you properly clean containers, fill them with potable, or safe, drinking water. All public water supplies are already treated and should be free of harmful bacteria. However, as an additional precaution, it is recommended that you add 5-7 drops, about 1/8 teaspoon, of chlorine bleach per gallon of water stored. This precaution protects you against any lingering organisms in storage containers that may have been inadvertently missed during the cleaning process.

Where to Store Water

Clearly label all water containers "drinking water" with the current date. Store the water in a cool, dry place away from direct sunlight and heat sources. Do not store it near gasoline, kerosene, pesticides or similar substances.

When potable water is properly stored, it should have an indefinite shelf life; however, it's a good idea to use and replace the stored water every 6 - 12 months. Rotating water this way provides you with an opportunity to experiment and check the amount of stored water against what you require. It also serves as an additional precaution against bacteria or viruses growing in containers which may not have been thoroughly or properly cleaned and sanitized.

If you have freezer space, storing some water in the freezer is a good idea. If you lose electricity, the frozen water will help keep foods in your freezer frozen until the power is restored. Make sure you leave 2 to 3 inches of space in containers because water expands as it freezes.

Emergency Sources of Water

In an emergency, if you have not previously stored water and commercial or public sources of water are not available, drain water from your plumbing system. Unless you are advised that the public water supply has been contaminated and is not safe, open the drain valve at the bottom of the water heater and salvage the water stored in the heater. A typical water heater holds 30-60 gallons of water. Discard the first few gallons if they contain rust or sediment. Let the water heater cool before draining it from the heater so it does not scald you. Turn off the electricity or gas to the water heater to prevent the heater from operating without water. Once water has been drained into clean, sanitized containers, add 5-7 drops of chlorine bleach* per gallon of water, and stir or shake the solution to mix it. Let it set 30 minutes before use.

Emergency Outdoor Water Sources

If you need to find water outside your home, you can use these sources. Be sure to treat the water first. Additional sources include:

Rainwater Streams, rivers and other moving bodies of water. Ponds and lakes. Natural springs. Avoid water with floating material, an odor or dark color. Use saltwater only if you distill it first. You should not drink flood water.

Hidden Water Sources in Your Home

If a disaster catches you without a stored supply of clean water, you can use the water in your hot-water tank, pipes and ice cubes. As a last resort, you can use water in the reservoir tank of your toilet (not the bowl).

Do you know the location of your incoming water valve? You'll need to shut it off to stop contaminated water from entering your home if you hear reports of broken water or sewage lines.

To use the water in your pipes, let air into the plumbing by turning on the faucet in your house at the highest level. A small amount of water will trickle out. Then obtain water from the lowest faucet in the house.

To use the water in your hot-water tank, be sure the electricity or gas is off, and open the drain at the bottom of the tank. Start the water flowing by turning off the water intake valve and turning on a hot-water faucet. Do not turn on the gas or electricity when the tank is empty.

Using Swimming Pool Water

You should always view your pool as “backup” water; keep the water treated; you never know when it will be needed! The maintenance of the free chlorine residual will prevent establishment of any microorganisms. The maintenance level should be kept about 3-5ppm free chlorine. (See Water Purification for detailed information on purifying pool water.) If other stored water stocks are not available, remove the necessary pool water and boil it or just treat with chlorine to the normal 5ppm. It is best to err on the side of caution.

Covering the pool at all times when not in use is a very good idea. Try to keep the cover clean and wash the area you put it on when removing it from the pool.

When and How to Treat Water for Storage

In an emergency, if you do not have water that you know is safe, it's possible to purify water for drinking. Start with the cleanest water you can find and treat with one of the following methods:

* Boiling and chlorinating: Water can be purified by boiling. Boiling times may vary from state to state, depending on altitude. In Colorado, the water is safe to use once after it has been boiled for three to five minutes and has cooled. If you plan to store boiled water, pour it into clean, sanitized containers and let it cool to room temperature. Then add 5-7 drops, or 1/8 teaspoon, of chlorine bleach* per gallon of water (1/2 teaspoon per 5 gallons). Stir or shake the solution to mix it. Cap the containers and store them in a cool, dry place.

* Filtering and chlorinating: You can filter water if you have a commercial or backpack filter that filters to 1 micron. These are available in sporting good stores and are recommended for use when backpacking. They are not recommended to clean large volumes of water. Filtering eliminates parasites such as giardia and cryptosporidium, but it may not eliminate all bacteria and viruses. Therefore, it's recommended that 5-7 drops (1/8 teaspoon) of chlorine bleach* be added per gallon of filtered water (1/2 teaspoon for 5 gallons). Stir or shake the solution to mix it. Wait 30 minutes before using the water, or cap the containers and store them in a cool, dry place.

*Use liquid household bleach that contains 5.25 percent hypochlorite. Do not use bleaches with fresheners or scents as they may not be safe to consume. The above treatment methods use a two-step approach so less bleach is needed, yet giardia and cryptosporidium are destroyed through boiling or eliminated by filtering. Chlorine may not be effective against these parasites. Since adding too much chlorine to water can be harmful, it's important to be as accurate as possible when measuring.

* Distillation involves boiling water and then collecting the vapor that condenses back to water. The condensed vapor will not include salt and other impurities. To distill, fill a pot halfway with water. Tie a cup to the handle on the pot's lid so that the cup will hang right-side-up when the lid is upside-down (make sure the cup is not dangling into the water) and boil the water for 20 minutes. The water that drips from the lid into the cup is distilled.

Most water filtration devices are designed for use on microbiologically safe water. Don't assume they are safe to use on contaminated water. Check with the manufacturer to be sure.

Use the following guidelines to determine if filtration equipment is adequate to use with microbiologically contaminated water:

Filtration Equipment

Safe on Microbiologically Contaminated Water?

Carbon Filter No

Reverse Osmosis No

Deionization Filter No

Pitcher Filter No

Faucet Mount Filter No

Steam Distiller Yes - but requires electricity

UV Sterilizer Yes - but requires electricity

Ceramic Filter Some - but only if rated for bacteriological protection

Equipment that is safe to use on contaminated water is often slow, costly, inconvenient and/or high maintenance. It makes the most sense to use the filtration equipment that best meets your normal daily needs and shift to water storage or alternative methods of water treatment in times of emergencies.