Emergency Drinking Water

By Duncan Long

During our everyday lives, most of us take water for granted. But that's often not the case following a major disaster, whether storm, earthquake, or flood. And today even a terrorist or lone nut could easily sabotage most cities water supplies; a chemical spill or other accident is all it would take to make city water supplies dangerous to use. If you're to survive any of the disasters you're concerned about, it's essential that you have drinking water.

Having a supply of water in or near your home during an emergency could save you a lot of drudgery. With the average person using tens of gallons of water a day for drinking, washing, and flushing stools, the prospect of having to carry water from a nearby spring, river, or lake is almost impossible to imagine without making a major change in your life style.

Yet, for most people, that's just what would happen in a disaster. The local water works shuts down and they're without water, at the mercy of merchants who charge exorbitant prices for the bottled water they have in stock or government distribution which may--or may not--show up in time to keep you from dying of thirst.

Getting an "in house" (or close-to-the-house) source of water would greatly improve your self-sufficiency potential and save a lot of time that would otherwise be spent hauling water during a disaster; time which might be better spent working at producing food, helping rebuild your home, or any of a number of other important tasks.

A few lucky souls have a nearby spring or creek from which water can be diverted into their living area. If this is the case for you, it may be that simply adding some plastic pipe (perhaps with an electric pump to help the water along its way) is all you need. An electric pump coupled with a small generator, or even a hand pump (source of which will be given below) might be just the ticket to get a good supply of water to your living area during an emergency.

Another storage system is the cistern. This consists of a large storage tank which is fed by water running from the water gutters on your home. Old timers made cisterns from stone lined holes located under a "pump house" with a hand pump stationed over the tank. To get water, the mistress of the house stepped out the kitchen with a bucket and went to the pump house to get a gallon or two

for cooking, washing dishes, or whatever. Those who "thought ahead" built the cistern under their home to make the process easier.

Of course a stone-lined cistern often had lots of problems. Sparrows often built nests in rain gutter drainage pipes and, if a proper "filter" wasn't placed in the line leading to the water, the little birds ended up in the cistern after the first big rain storm (along with the occasional mouse and who-knows-what). Consequently water supplies often became less than ideal for obvious reasons.

However, during an emergency when you'll be treating water, the drain pipes from your rain gutters could become a good source of water for non-drinking use, for watering a "survival garden" during a protracted disaster, or even for providing drinking water for your pets. So you'd do well to have a large "rain barrel" that you can move outside and place under the drain pipe during an emergency in order to capture a little extra water.

Unfortunately most of us don't have a near-by creek or spring and many areas don't have enough rainfall to make a cistern--or even a rain barrel--of much use. In such cases, you're most likely connected into a municipal or rural water system that could be seriously disrupted by a major disaster. If this is the situation, your best bet is to store plenty of water for an emergency.

If you have your own pump and water well, then you need to create a system that makes it possible to run the pump during an emergency. This might mean a gas-operated pump or a generator to run the electric motor powering the pump that's in place; if your budget is limited, then a hand pump that can be attached to the well head during a protracted electrical outage could be a life saver.

A gas-powered pump can also be put to a number of other purposes that might be important during an emergency. One obvious use is in fighting fires; if you have a source of water like a stream, lake, or swimming pool, a gas-operated water pump could enable you to fight a fire when the city water lines dropped or failed due to breaks in the line or heavy use by the fire department.

If you purchase a pump capable of propelling liquids containing mud and sand (often known as "trash pumps"), you could also employ the pump as an emergency sump pump to remove water from a basement or other area during flooding. While you can't keep such work up indefinitely during a flood produced by a river or the like, if your problem is simply water run-off, backed up sewers, or the like, then having a pump that can be fired up to empty your basement and keep the water level from rising enough to damage anything you

have in the basement would be a big plus. (And would save you from a lot of cleanup headaches in the way of stench and mildew down the road.)

A trip to a large hardware store will often reward you with a choice of several gasoline-operated pumps. A good mail-order source is Harbor Freight Tools (3491 Mission Oaks Blvd., Camarillo, CA 93011 800-423-2567) which has a number of heavy duty, self-priming centrifugal pumps that are ideal for emergency use, including several heavy duty trash pumps. Costs run from $289 to $1,799 depending on the volume flow and other capabilities of the pump.

Of course if you use a pump to lift water out of a basement or other area, great care must be exercised to sterilize and clean the pump before employing it to pump drinking water.

If you are on a city or rural water supply line, then you might still consider creating an alternate supply of water. Some people have connected a hand or motorized pump to their swimming pool, thereby creating a source of water that can be employed for washing clothing and running the plumbing or--if properly processed (as outlined in a moment)--for drinking and food preparations. You should also avoid water sources that may contain contaminates or chemicals added to kill algae or other plants since such water sources might be poisonous to drink.

Lacking a source of water, you'll need to store water for your family. The first question is much water do you need?

Water needs are fairly easy to figure, but you must bear in mind that you'll need more water in hot weather or when doing strenuous work. Too, water will be needed for cleanup, food preparation, and accidental loss of water due to spills, broken containers, and other unforeseen happenstance. Therefore, when storing water, always give yourself a bit extra. It's better to have too much than not enough.

That said, plan on providing a gallon of water per person per day just for drinking in extremely hot weather. Cooking and bathing will call for even more water per person. And you should try to save a little extra water in case you need to supply your neighbors or have relatives who've dropped in from out of state when a disaster occurs.

How many days do you need to have water for?

The bare minimum is four to seven days of water. But given the degree of damage that a riot, hurricane, or major earthquake might cause to a densely settled area, it's a good plan to have considerably more than this with a month seeming like a minimum that you should store just in case you end up in the middle of a major disaster.

One month's worth of drinking water comes to 60 gallons per person. That's a lot of water (and makes finding a source of water near your home a more attractive proposition--more on this in a bit). Storing this much water can be a task, but there are a number of ways to accomplish this.

At least part of the water in your storage system should be easy to get to and should be in containers that are easily transported and transferred from. This will make it easy for you to cope with a short-term disaster and make things considerably more convenient for you during the initial time following a major disaster.

If you store some of your water in especially large containers, sure that they are anchored so they can not shift during an earthquake or tornado. The lower they are in your house the better, since a container of water is potentially dangerous if it should fall from un upper floor--a distinct possibility during a disaster that shakes or damages your home.

The water containers will ideally be placed close to the floor in the room they are stored in as well for the same reason. A tall stack of water bottles is potentially lethal if it tumbles over. This is especially important to remember if you have small children who might be tempted to climb a stack of bottles or other containers.

Plastic containers are first choice for water storage because they are tough and won't break into dangerous shards if dropped. Glass containers should be avoided for water storage because they are so dangerous.

If your family drinks pop, you can obtain a supply of tough containers that are perfect for water storage if you purchase your beverages in two-liter plastic bottles. These bottles come with screw-top lids, are designed for use with food, and are very tough. They're also easy to move and handle; a string can allow them to be carried on a belt as an improvised canteen. If they tip over, they don't break.

The two-liter bottles have another plus. If you don't fill them to the brim and instead leave an air space in their tops, they can withstand freezing without

rupturing. That makes them ideal for water storage in cold climates and also makes it possible to keep a couple in the freezer where they'll extend the storage time of food in your refrigerator if the power goes off for an extended time. While the food in the freezer compartment won't last a long time, having two or three bottles of ice in the freezer can extend it by a number of hours, making it possible to eat an extra meal or two from what's in the freezer rather than being forced to throw the food out. Best of all, two-liter pop bottles cost you nothing if your family already is drinking pop.

Don't use plastic milk containers since they split easily and spring leaks over time due to the "environmental friendly" use of biodegradable plastic in most of these containers.

There are a few other "free" sources of water storage containers that are fairly good. Many restaurants, donut shops, dairy queens, and fast food stores are sources of plastic containers that can be used. These are often just a few phone calls away. Once you've located sources of plastic containers which are free (or can be purchased for a nominal price), collect them, rinse them carefully, and put your water into them.

If you're "scrounging" for water containers, be sure to avoid those which were not designed for food or water storage. Many of these will have plastic that leaches dangerous chemicals into water stored in them. Likewise, be sure to avoid containers in which toxic materials like gasoline, paint, antifreeze, or solvents were stored. Any of these will contaminate water cached in them.

Storing water in metal containers is generally not too great, either. The water often causes rust or takes on the tastes of the metal used in the container.

Many of the companies selling freeze-dried and dehydrated foods also sell plastic water containers. Unfortunately, these carry rather hefty price tags. But if your time is worth much, simply buying these outright rather than trying to locate "free" containers, obtain them, and clean them may be a more sensible route to take.

Many commercial water containers come in several sizes. The smaller 5-gallon containers are easier to work with; the larger 40- and 55-gallon barrels offer a savings in cost per gallon stored. You'll have to decide which is best for your needs. (Costs run from around $14 for a 5-gallon drum to about $50 for a heavy-duty plastic 55-gallon drum.)

One interesting innovation in water storage is the "Bag 'n Box". This consists of a mylar plastic bag that nestles into a cardboard box. The metal-coated plastic contains the water and protects it from light (to prevent the growth of algae or bacteria) while the box supports the weight of the water in the bag. These bags are quite inexpensive and often take less space per gallon than other stored water since they're rectangular and pack into many spaces more readily.

If you are forced to carry water to your house because you didn't store enough, you can create a similar Bag 'n Box with two large plastic garbage bags nestled inside a pillow case or gunny sack. If care is taken in making these, the cloth will support the plastic bags while the plastic retains the water.

These bags aren't perfect. They're awkward and will occasionally break or be dropped--be prepared to spill some water from time to time if you use them. And care must be taken to tie the opening closed. An important note: Most modern garbage bags are treated to discourage vermin from biting into the bags. Consequently water transported in a garbage bag should be used for non-drinking purposes only and should not be used for preparing food. This water would be ideal for bathing or non-dietary purposes, however.

When working with any container of water, remember that it could become dangerous if it were dislodged from a shelve or other area during a storm or earthquake. Because of this potential danger, all water containers (as well as other heavy containers) must either be secured to a wall to prevent it from tipping over or placed directly on the floor.

Also be sure to put large containers exactly where you want them before filling them with water--they get super heavy when full. Also, don't forget that vessels can split open if they freeze. If you live in an area where temperatures dip well below freezing for extended periods of time, then you need to take care to keep large containers of water from freezing.

If you've used large drums for storage, retrieving water from the container can be a problem. Flexible plastic tubing can extract the water from such drums. Hand pumps that can be coupled to tubing are available many hardware stores. The prices for the plastic pumps range from $10 to $30 and tubing is nominal when you purchase the pump.

Of course it's also possible to remove water from containers without using a pump. You can simply siphon it. To siphon, all that's required is a length of plastic or rubber tubing. The water container must have its water level above the point the water is being delivered to. One end of the tubing is submerged in

the water and the other end in the empty container. By sucking on the end of the tube until the air is pulled from it, you can create a vacuum in it that pulls water from the container, through the tube, and into the empty container. Once the water starts traveling through the tube, gravity and the vacuum created behind it keep the water flowing.

To stop the flow, you can pinch off the tube (a clamp works well) or--if you wish to stop it altogether--simply lift the free end above the water source's level.

To minimize the water needed for non-drinking purposes, premoistened towelettes are ideal. These can be utilized for a variety of cleansing chores. The towelettes have chemicals to cut through grime and grease. They're readily available in most grocery stores around the baby food section (they're used for cleaning babies).

It should be noted that there are other sources of water in most homes that may be "tapped."

If you're at home when a disaster hits, you can secure a large amount of water by turning off the water intake valve of your home or the water main outside your house. Doing this will keep the water in the home's plumbing from being siphoned as water leaks from the municipal supply (this will also prevent it from being contaminated by later water that may contain dirt or other foreign materials due to leaks and other problems when the system comes back on).

A considerable amount of water will be trapped in your home even if you fail to get the water turned off immediately following a disaster. Your hot water heater holds 20 to 40 gallons of water (which can be accessed via the drain valve toward the front, bottom of the water heater).

Another source of water which may not be suitable for drinking due to sediment or mold in it, but which can be expended for many other purposes is located in the water storage tank of bathroom stools. Unlike water in the bowl of a stool, the tank water is relatively free of bacteria. Provided it doesn't have a "freshener" chemical added to it, it's relatively clean and free of contaminants.

Additional water will be contained in the pipes of the home if you turn them off immediately after any disaster that might affect the water supply. This water can be drained from the lowest facet in the home (opening a valve on an upper level of the house will speed up the flow of the water from the lowest facet).

If your area may be facing freezing temperatures and you're unable to heat your home, then you should be sure to drain the water from all pipes as well as the hot water heater to avoid damage due to frozen pipes. The "traditional" method of sterilizing water, and still one of the best, is to boil it. It leaves the water tasting flat, but is the most effective way to kill the germs. In order to kill all the bacteria and viruses in the water, be sure the water is at a FULL boil for at least 15 minutes AND add 5 minutes to the boiling time for every 1,000 feet you are above sea level. Less time, and you'll not necessarily kill all the harmful germs. Boiling water is a safe practice with water that was fresh and safe when stored in bottles. But boiling will not kill spores. Therefore, if you're forced to use water from outdoor sources such as springs, ponds, or rivers, or your municipal water may have been contaminated by sewage run off, then you might have "beasties" in the water that boiling won't kill in their dormant forms. In such a case, the best way to sterilize water is to use iodine compounds designed specifically for this purpose. Iodine compounds are found in are the "tetraglycine hydroperiodide" water purification tablets. These are sold under the trade names of "Potable Aqua", "Globaline", and "Coghlan's" with Potable Aqua being the most common in the US. A good place to find these is a local outdoors/camping/sporting goods store or in the outdoor department of a large store.

The shelf life for tetraglycine hydroperiodide tablets is up to four years IF they are kept sealed, not exposed to bright light, and kept cool. Be sure to replace them after they exceed there expiration date. Follow the directions on the container when using these tablets and be sure to allow the full time called for before drinking the water since purification isn't instantaneous. Several other sources of iodine can be used for water purification. But they aren't nearly as easy to use. One is two percent tincture of iodine and the other is iodine crystals. Two percent tincture of iodine can be used at the rate of 5 drops per quart of water being sterilized. Double the amount if the water is cloudy or smells bad. Since the killing of the bacteria is not instantaneous, you must be sure to let the water stand for a half hour before drinking it. Iodine will give a strange taste to water; this is normal with this method of sterilization. Iodine crystals can be utilized to sterilize water, but they not practical and potentially dangerous as well since it's easy to add them in the wrong proportion and the crystals give off poisonous fumes when being mixed with the water. If you're forced to use iodine crystals because nothing else is available, employ a measuring cup graduated in grams. Measure 4 to 8 grams of the iodine crystals and add these to ONE ounce of water. Stir for three minutes, being careful not to inhale the poisonous fumes. After stirring, allow the crystals that have not dissolved to sink to the bottom of the container.

Do not drink this water. Instead, remove 7 milliliters of the liquid from the TOP of the clear solution you've created. Use this liquid removed from the top to treat each quart of your water. Do NOT allow any undissolved crystals in the solution to escape into the water you're sterilizing. Ingesting just one tiny crystal will cause violent illness. Iodine crystals or tincture of iodine must be replaced every few years since both lose their potency over time. If you're using old chemicals, you can increase the dosage to compensate for the loss of potency--but be very cautious with the iodine crystals. Also, remember that all iodine compounds are poisonous; keep them out of your children's reach.

Another family of chemicals that can be used to sterilize water are chlorine compounds. Unfortunately, these do not kill all viruses and amoebic cysts. Therefore, the use of these should be avoided if possible or, at least, limited to use with water that was sterile when stored. The most easily utilized of the chorine compounds are Halazone tablets. These have a shelf life of only 2 years if kept cool and sealed airtight, making them inferior to iodine purification tablets both in terms of shelf life as well as their ability to sterilize contaminated water. If you're using these purification tablets, follow the directions on the container. (Chlorine tablets are generally used 5 per quart--but be sure to check.) Double the number of tablets for hazy or foul smelling water. Wait for 30 minutes after the tablet has dissolved before using the water.

Sodium hypochlorite the active ingredient found in household bleach--can also be used to sterilize water. Again, since this is a chloride compound, is will NOT kill all organisms and should be employed only with water that was sterile when it went into containers and ONLY if iodine tablets or the like aren't available. Use 5.25% sodium hypochlorite solution -bleach -at the rate of 2 or 3 drops per quart of water; double the amount if the water is cloudy or smells bad.

It should be noted that boiling or chemical sterilization ONLY kills organisms in the water. Neither extracts harmful chemicals or other contaminants. This could be an important point if you're getting water from a source that might contain contaminants. Following a major disaster, it's possible that damaged chemical plants, underground storage tanks, or the like might release their contents into aquifers, lakes, wells, or other sources of drinking water. In such a case, sterilizing water would not make it fit for use.