



Emergency Water Storage + Treatment

Comprehensive household preparedness guide

PURPOSE: This guide combines current CDC and EPA emergency-water guidance with clearly labeled practical preparedness information. It covers storage, boiling, liquid bleach, calcium hypochlorite, iodine, treatment tablets/drops, filtration, distillation, chlorine testing, shelf life, and the limits of each method.

The first rule: identify the hazard before choosing a treatment

Situation	Best response	Basis
Known-safe municipal water stored correctly	Store it; protect from recontamination.	CDC storage guidance
Possible microbial contamination only	Bottled water if available; otherwise boil or disinfect.	CDC / EPA
Cloudy or visibly dirty water	Settle and pre-filter first; then boil/disinfect.	CDC / EPA
Possible Cryptosporidium or Giardia	Prefer boiling; chlorine dioxide may work if label directions are followed.	CDC
Fuel, toxic chemicals, heavy metals, salts, radioactive material, unknown chemical spill	DO NOT rely on boiling or disinfection. Use another source and follow authorities.	CDC / EPA

A practical treatment hierarchy

- 1) Commercial bottled water or water already known to be safe.
- 2) Properly stored household emergency water.
- 3) Boiling, when fuel and equipment are available and the problem is microbial.
- 4) Correct chemical disinfection when boiling is not practical.
- 5) Filtration as appropriate for the hazard; many portable filters require additional disinfection.
- 6) Distillation or other specialized treatment only when you understand what the equipment actually removes.

SECTION 1 | Build and protect an emergency water supply

CDC recommends at least 1 gallon of water per person per day for 3 days and says to try to store a 2-week supply if possible. Store more for hot climates, illness, pregnancy, pets, and other special needs.

Commercially bottled water

- **CDC** calls unopened commercially bottled water the safest and most reliable emergency source.
- Observe the expiration or best-by date printed on the package.
- Keep bottles away from heat, direct sunlight, fuels, pesticides, solvents, and strong odors.

Home-filled containers

Step	Official CDC guidance
Container	Use new or known-history food-grade water containers. Never reuse containers that held toxic chemicals.
Wash	Wash with soap and rinse completely.
Sanitize	Mix 1 tsp regular unscented liquid bleach (5%-9% sodium hypochlorite) with 1 quart / 4 cups water. Coat all interior surfaces.
Wait	Leave sanitizing solution in contact for at least 30 seconds; pour it out and air-dry.
Fill + seal	Fill with known-safe drinking water. Close tightly. Label DRINKING WATER and the fill date.
Store	CDC: cool location, ideally 50°F-70°F, away from sunlight and toxic substances.
Rotate	CDC says to replace home-filled water every 6 months.

55-gallon barrels and large containers

- A full 55-gallon barrel weighs about 460 lb. Use a stable, manufacturer-rated support and place it where the floor can carry the load.
- **PRACTICAL PRACTICE - NOT A CDC RULE:** keeping a barrel off bare concrete on a full-support pallet or stand can improve inspection, airflow, and protection from abrasion or garage spills.
- Protect from vehicle impact, freezing, prolonged heat, direct sunlight, fuel, fertilizer, pesticides, paint, solvents, pool chemicals, and other strong chemicals.
- Do not stack unless both the container and rack are specifically rated for the load.

If you choose not to rotate every 6 months

CDC does not guarantee a multi-year shelf life for home-filled water. If a household keeps water longer, treat that as an unofficial preparedness choice: inspect the container and water carefully, and reassess/treat before drinking if safety is uncertain.

SECTION 2 | When stored water is not enough

Possible household sources

- Water from a household tap-water heater tank, if the tank and plumbing have not been contaminated or damaged.
- Melted ice made from water that was safe before the emergency.
- Water remaining in household plumbing, when local authorities have not warned of contamination.
- Surface water such as rivers or lakes only as a last-resort source, and only after evaluating contamination risk and treating appropriately.

Never drink water from a home heating boiler/radiator system. If floodwater, fuels, industrial chemicals, pesticides, radioactive materials, or other toxic contaminants may have entered a source, use another source.

Pre-treatment for cloudy water

- Let suspended material settle.
- Draw off the clearer water and/or strain it through a clean cloth, paper towel, or coffee filter.
- Then use the selected disinfection method. Cloudiness reduces the effectiveness of chemical disinfection.

Boiling - CDC's preferred microbial method

1. If water is cloudy, settle and filter it first.
2. Bring clear water to a rolling boil for 1 minute.
3. At elevations above 6,500 feet, CDC says boil for 3 minutes. EPA's current page uses a 5,000-foot threshold for the 3-minute instruction.
4. Let the water cool naturally.
5. Store in clean, sanitized containers with tight covers.

WHY BOILING MATTERS: CDC says chemical disinfectants do not work as well as boiling against some germs, including the parasites *Cryptosporidium* and *Giardia*.

- Boiling kills germs; it does not remove fuel, toxic chemicals, heavy metals, salts, radioactive materials, or many other chemical contaminants.
- Improve flat taste by pouring cooled boiled water between clean containers, or by following CDC's pinch-of-salt guidance if appropriate.

SECTION 3 | Liquid household bleach

Use only regular, unscented liquid household chlorine bleach that is suitable for disinfection. Do not use scented, color-safe, splashless/gel, or products with added cleaners.

Bleach shelf life for emergency water treatment

- EPA says to use fresh liquid chlorine bleach, or bleach that has been stored at room temperature for less than one year.
- Bleach loses strength over time, especially with heat and poor storage. The printed product date and manufacturer instructions matter.
- For preparedness, rotate liquid bleach rather than assuming an old bottle still has its labeled concentration.

EPA concentration-specific dosing - primary chart

Water	6% clear	6% cloudy/cold	8.25% clear	8.25% cloudy/cold
1 gal	8 drops	16 drops	6 drops	12 drops
2 gal	1/4 tsp	1/2 tsp	1/8 tsp	1/4 tsp
4 gal	1/3 tsp	2/3 tsp	1/4 tsp	1/2 tsp
5 gal*	0.4 tsp	0.8 tsp	0.3 tsp	0.6 tsp
10 gal*	0.8 tsp	1.7 tsp	0.6 tsp	1.25 tsp
15 gal*	1.25 tsp	2.5 tsp	0.9 tsp	1.9 tsp
30 gal*	2.5 tsp	5 tsp	1.9 tsp	3.75 tsp
55 gal*	4.6 tsp	9.2 tsp	3.4 tsp	6.9 tsp

*Arithmetic scale-ups from EPA's published 4- and 8-gallon measurements; rounded for practical use.

CDC simplified guidance for 5%-9% bleach

CDC SIMPLIFIED RULE: If the bleach label does not provide drinking-water directions and the product contains 5%-9% sodium hypochlorite, CDC uses 8 drops (0.5 mL) per gallon of clear water, or 1/2 teaspoon per 5 gallons. Double the amount for cloudy, murky, colored, or very cold water. Mix well and wait at least 30 minutes.

After adding bleach

- Mix thoroughly and let stand at least 30 minutes.
- EPA says the water should have a slight chlorine odor. If it does not, repeat the dose and wait another 15 minutes.
- If chlorine taste is too strong, pour between clean containers and allow it to stand for a few hours.
- Do not confuse a chlorine odor or test-strip reading with proof that the water is free of every microbial or chemical hazard.

SECTION 4 | Calcium hypochlorite (HTH) - official EPA emergency method

EPA recognizes high-test granular calcium hypochlorite as an alternative when liquid bleach is unavailable. It is highly concentrated and compact, but it is also a powerful oxidizer and requires careful handling.

Why preparedness planners consider it

- Compact and concentrated: a small quantity makes a much larger volume of chlorine stock solution.
- Potentially economical per gallon treated because the dry chemical is highly concentrated; actual cost depends on product concentration, price, and waste.
- Potentially better suited to long-term preparedness than liquid bleach because EPA specifically cautions that liquid bleach used for emergency water treatment should be fresh or stored less than one year at room temperature.
- No federal agency gives calcium hypochlorite a universal preparedness shelf life. Follow the product label and manufacturer expiration/storage information; do not claim '10 years' or 'indefinite' without product-specific support.

EPA stock-solution method

1. Work in a ventilated area and wear eye protection.
2. Add 1 heaping teaspoon (approximately 1/4 ounce) of high-test granular calcium hypochlorite to 2 gallons of water.
3. Stir until dissolved. EPA says this produces a chlorine stock solution of approximately 500 mg/L.
4. To disinfect water, add 1 part of the stock solution to each 100 parts of water being treated.
5. If chlorine taste is too strong, pour the water between clean containers and let it stand for a few hours before use.

Water to disinfect	500 mg/L stock solution	Kitchen equivalent
1 gallon	1.28 fl oz	about 2.5 Tbsp
5 gallons	6.4 fl oz	about 0.8 cup
10 gallons	12.8 fl oz	about 1.6 cups
15 gallons	19.2 fl oz	about 2.4 cups
30 gallons	38.4 fl oz	about 4.8 cups / 1.2 qt
55 gallons	70.4 fl oz	about 8.8 cups / 2.2 qt

Values are arithmetic scale-ups of EPA's 1:100 stock-to-water ratio.

Critical handling cautions

- Do not assume every product sold as 'pool shock' is suitable. Products may contain different active ingredients or additives.
- Keep calcium hypochlorite in its original labeled container and follow all label storage requirements.
- Keep away from acids, ammonia, fuels, organic materials, heat, ignition sources, and incompatible chemicals.
- Never mix the dry chemical directly into drinking water by guessing. Make and dose the EPA stock solution as directed.

SECTION 5 | Iodine, treatment tablets, and treatment drops

2% tincture of iodine - EPA emergency method

Water condition	2% tincture of iodine	Contact time
Clear water	5 drops per quart or liter	Stir; wait at least 30 minutes
Cloudy or colored water	10 drops per quart or liter	Stir; wait at least 30 minutes

CDC WARNING: Pregnant people, people with thyroid problems, and people with iodine hypersensitivity should avoid iodine-disinfected water. CDC also says no one should drink iodine-disinfected water for more than a few weeks at a time.

Commercial water-treatment tablets and drops

- CDC and EPA recognize products containing chlorine dioxide, chlorine, iodine, or other disinfectants.

- Follow the exact label/package directions. Products are designed for specific volumes, strengths, temperatures, and contact times.
- Chlorine and iodine products kill many bacteria and viruses but may not kill *Cryptosporidium*.
- CDC says chlorine dioxide tablets can kill *Cryptosporidium* when the product directions are followed correctly.
- Do not assume one tablet equals one gallon; tablet strengths vary.

RV, marine, and potable-water treatment solutions

READ THE LABEL: An RV or marine product labeled only to sanitize a fresh-water tank, plumbing, hose, or system is not automatically a drinking-water disinfectant. Use a liquid product to treat water for consumption only when its label specifically authorizes drinking/potable-water disinfection and gives a dose and contact time for that use.

- EPA requires disinfectants sold to treat drinking water to be registered under FIFRA; the approved label states where and how the product may be used.
- Look for an EPA Registration Number when the product makes a drinking-water disinfection claim, and follow the exact label directions. Do not substitute a tank-sanitizing dose for a drinking-water treatment dose.

Shelf life of tablets and drops

Source/product	Published shelf-life information	How to use this
Federal guidance	No universal shelf life is assigned to all tablets/drops.	Use the printed expiration date and product label.
Aquatabs (NaDCC), manufacturer example	5 years in strip packs; 3 years in tubs under stated storage conditions.	Manufacturer claim; not a CDC/EPA shelf-life rule.
Katadyn Micropur MPI chlorine dioxide, manufacturer example	5 years from date of manufacture.	Manufacturer claim; check current package expiration.

Product examples are included only to show why shelf life must be product-specific; inclusion is not an endorsement.

SECTION 6 | Filtration, reverse osmosis, UV, and distillation

Portable filters

- CDC says most portable water filters do not remove bacteria or viruses.
- Choose a filter labeled to remove the organism or contaminant of concern; a filter that removes parasites is not automatically a purifier.
- Filtered water may still need boiling or chemical disinfection.
- Prefiltering cloudy water through cloth or a coffee filter improves later treatment but is not itself disinfection.

Reverse osmosis and UV

- CDC says reverse osmosis can remove parasites, bacteria, viruses, and some chemicals, but performance depends on the specific system and its certified claims.
- EPA's WaterSense treatment guide notes that UV systems can inactivate biological contaminants but do not remove chemical contaminants. UV also requires power and appropriate water clarity.

Distillation

- CDC describes distillation as boiling water and collecting the condensed vapor.
- Distillation can remove parasites, bacteria, viruses, many dissolved solids, heavy metals, and many chemicals.
- Distillation does NOT remove every chemical. CDC notes that some volatile organic compounds, volatile solvents, and certain pesticides can carry through.
- Distillation is energy-intensive and slower than basic emergency disinfection. Use equipment designed for potable-water distillation and understand the source-water hazard.

IMPORTANT: Do not teach distillation as a universal answer to chemically contaminated water. If the contaminant is unknown, volatile, radioactive, or associated with an industrial/fuel spill, use another approved source and follow authorities.

SECTION 7 | Chlorine testing, taste, and what a reading can - and cannot - tell you

Free chlorine, total chlorine, and chloramine

- Free chlorine is chlorine available to disinfect.
- Combined chlorine includes chlorine that has reacted with compounds in the water; chloramine is commonly used by some utilities.
- Total chlorine is the sum of free and combined chlorine.
- If your utility uses chloramine, a free-chlorine-only strip can be misleading; use a total-chlorine test or, preferably, a kit that reports both free and total chlorine.

What to buy for an emergency kit

Test type	Best use	Why it helps
DPD free-chlorine strips / kit	Chlorine-treated water or utilities using free chlorine	Shows chlorine still available as a disinfectant.

DPD free + total chlorine strips / kit	Best all-around preparedness choice; useful if the utility uses chloramine	Lets you distinguish free chlorine from total chlorine and is more informative across different municipal systems.
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PRACTICAL RECOMMENDATION: Choose a kit that reads the low drinking-water residual range; many pool-only strips are designed for much higher chlorine levels. DPD methods are recognized in EPA drinking-water monitoring methods, but CDC/EPA do not require household emergency users to test chlorine after following the emergency dose-and-contact-time directions.

The 4.0 mg/L number

EPA's 4.0 mg/L (ppm) value is the Maximum Residual Disinfectant Level (MRDL) for chlorine/chloramine in regulated public water systems. It is NOT a recommended home-treatment target and is not proof that emergency water is safe.

Use testing as a supplement - not as the treatment method

RECOMMENDED SEQUENCE: 1) Use the official dose for the product and water condition. 2) Observe the required contact time. 3) Use EPA's slight-chlorine-odor check for bleach-treated water. 4) Use DPD testing as an optional supplemental check. A test-strip reading does not replace correct dosing, contact time, source evaluation, or chemical-contamination warnings.

- A detectable residual can be useful evidence that chlorine remains in the water, but it is not a safety certification.
- Water source, turbidity, temperature, pH, disinfectant age/concentration, contact time, storage history, and chemical contamination all matter.
- If treated water does not have the slight chlorine odor described by EPA after the first contact period, EPA instructs users to repeat the dosage and wait another 15 minutes.
- Do not taste-test suspicious water to decide whether it is safe.

When to reject stored water for drinking

Check	Reject or use another source when...
Container	Cracked, leaking, swollen, damaged, flood-exposed, or stored next to a chemical spill/strong fumes
Water	Unusual color, persistent cloudiness, visible growth, non-chlorine chemical odor, oily sheen, or other signs of contamination
History	Unknown source, unknown container history, or known exposure to fuel/pesticides/industrial chemicals

SECTION 8 | Shelf-life and rotation quick reference

Item	Shelf-life / rotation guidance	Source
Home-filled drinking water	Replace every 6 months	CDC
Commercial bottled water	Observe printed expiration/best-by date	CDC
Liquid household bleach for emergency water treatment	Use fresh bleach or bleach stored at room temperature for less than 1 year	EPA
Calcium hypochlorite	No universal federal shelf-life number; follow product label/manufacturer	EPA label-based approach
Water-treatment tablets/drops	No universal federal shelf-life number; follow product expiration date	CDC / EPA
Aquatabs strip packs - example	5 years	Manufacturer
Aquatabs tubs - example	3 years	Manufacturer
Katadyn Micropur MP1 - example	5 years from manufacture	Manufacturer

Recommended household water-treatment kit

- Stored drinking water and portable water containers
- Fresh unscented household bleach (5%-9% sodium hypochlorite)
- One clearly labeled backup chemical treatment option (for example, chlorine dioxide tablets) with current expiration date
- Calcium hypochlorite only if the household understands safe handling and EPA stock-solution preparation
- Clean measuring spoons and/or graduated medicine syringe
- Clean cloths / coffee filters for prefiltration
- A suitable portable filter, with replacement elements if applicable
- Metal pot or kettle and a safe way to boil water
- Eye protection and chemical-resistant gloves for handling concentrated chlorine products
- DPD chlorine testing: free-chlorine strips/kit at minimum; a free + total chlorine kit is the more versatile preparedness choice
- Permanent marker and labels for fill/treatment dates
- Printed copy of this guide and current product labels

EDUCATIONAL & SAFETY NOTICE: Follow current local, CDC/EPA/FEMA and product-label guidance. Treatment depends on the water hazard; boiling or disinfectants do not make chemically contaminated water safe. See full disclaimer at end.

SECTION 9 | Government guidance to keep with your supplies

Guide	What it covers	Where to find it
CDC - How to Create an Emergency Water Supply	Storage amount, container sanitation, 6-month rotation, storage conditions	cdc.gov/water-emergency
CDC - How to Make Water Safe in an Emergency	Boiling, bleach, tablets/drops, iodine cautions, parasites, chemical contamination	cdc.gov/water-emergency
EPA - Emergency Disinfection of Drinking Water	Boiling, concentration-specific bleach dosing, calcium hypochlorite, iodine, tablets	epa.gov/ground-water-and-drinking-water
Ready.gov / FEMA - Emergency Supply Kit	At least 1 gallon per person per day for several days; emergency kit planning	ready.gov
Local water utility / health department	Boil-water, do-not-drink, do-not-use advisories and incident-specific instructions	Local source - highest priority during an event

Emergency quick rules

STORED WATER: At least 1 gallon/person/day for 3 days; try for 2 weeks. Rotate home-filled water every 6 months.

BOIL: Rolling boil 1 minute. CDC: 3 minutes above 6,500 ft. EPA: 3 minutes above 5,000 ft.

BLEACH: Read the sodium-hypochlorite percentage. Use EPA's 6% / 8.25% concentration-specific table when applicable; CDC also provides a simplified 5%-9% rule of 8 drops per gallon of clear water.

CALCIUM HYPOCHLORITE: EPA: 1 heaping tsp in 2 gal makes ~500 mg/L stock; use 1 part stock per 100 parts water.

TABLETS / DROPS: Follow the exact label. Product strengths and contact times vary.

CHEMICAL CONTAMINATION: Do not rely on boiling/disinfection. Use another source and follow authorities.

SECTION 10 | Source basis and scope

Primary official sources

Centers for Disease Control and Prevention (CDC). How to Create an Emergency Water Supply. June 27, 2025. <https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html>

Centers for Disease Control and Prevention (CDC). How to Make Water Safe in an Emergency. Sept. 19, 2024. <https://www.cdc.gov/water-emergency/about/index.html>

Centers for Disease Control and Prevention (CDC). How to Find Clean Water in an Emergency. June 25, 2025. <https://www.cdc.gov/water-emergency/about/how-to-find-clean-water-in-an-emergency.html>

U.S. Environmental Protection Agency (EPA). Emergency Disinfection of Drinking Water. updated Feb. 24, 2026. <https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>

U.S. Environmental Protection Agency (EPA). National Primary Drinking Water Regulations. current standards page. <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>

U.S. Environmental Protection Agency (EPA). Understanding Drinking Water Requirements under FIFRA and SDWA. Updated Aug. 12, 2026. <https://www.epa.gov/ground-water-and-drinking-water/understanding-drinking-water-requirements-under-fifra-and-sdwa>

U.S. Environmental Protection Agency (EPA). Method 334.0: Determination of Residual Chlorine in Drinking Water Using an On-line Chlorine Analyzer. Includes DPD-based chlorine residual methods and free/total chlorine measurement. <https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1005OLV.txt>

Centers for Disease Control and Prevention (CDC). About Home Water Treatment Systems. current CDC page. <https://www.cdc.gov/drinking-water/about/about-home-water-treatment-systems.html>

U.S. EPA WaterSense. Guide to Selecting Water Treatment Systems. 2025. <https://www.epa.gov/watersense>

Ready.gov / FEMA. Emergency supply kit guidance. current Ready.gov resources. <https://www.ready.gov/kit>

Manufacturer-supported shelf-life examples

Aquatabs / Medentech. FAQ - shelf life of tablet packaging. current manufacturer page. <https://www.aquatabs.com/faq/>

Katadyn. Micropur MP1 Water Purifier Tablets - shelf life 5 years from manufacture. current manufacturer product page. <https://www.katadyngroup.com/>

SOURCE POLICY: Where CDC or EPA gives a specific emergency-water instruction, this guide uses that instruction. Where no federal shelf-life number exists, the guide says so and relies on the product's current manufacturer label/expiration information rather than inventing a universal number.

IMPORTANT WATER-SAFETY DISCLAIMER

PLEASE READ BEFORE USING THIS EMERGENCY WATER GUIDE

Educational purpose only

This material is provided for general education and emergency-preparedness planning. It is not medical, public-health, engineering, plumbing, environmental, or professional water-treatment advice, and it does not replace individualized guidance from qualified professionals or government authorities.

Water conditions and products vary

Water source, contamination, turbidity, temperature, chemistry, container condition, storage environment, disinfectant age, and product concentration can change treatment requirements and results. Measurements and chlorine readings can be inaccurate. A clear appearance, acceptable odor, or detectable chlorine residual does not prove that water is free of disease-causing organisms or chemical contamination.

Use current official instructions

Always follow current instructions from local public-health officials, emergency-management authorities, your water utility, CDC, EPA, FEMA, and the product manufacturer. Verify the active ingredient and concentration before using

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any disinfectant. Never mix chlorine products with acids, ammonia, fuels, organic materials, or other chemicals. Water suspected of containing fuel, pesticides, heavy metals, salt, toxins, industrial chemicals, or radioactive material cannot be made safe by boiling or chlorination; use another source.

No testing, certification, or guarantee

The Haven Project Foundation, its directors, officers, employees, volunteers, presenters, affiliated churches, and contributors do not inspect, test, approve, or certify any water source, container, chemical, equipment, treatment method, storage practice, or finished water. No representation or warranty is made that following this material will make or keep water safe, potable, or suitable for any particular person or use.

Personal responsibility and assumption of risk

Anyone who uses this information is responsible for evaluating current conditions, obtaining appropriate supplies and professional guidance, following official directions and product labels, and deciding whether water is safe to use. To the fullest extent permitted by law, the user assumes all risks arising from the use, misuse, storage, handling, measurement, treatment, testing, or consumption of water and agrees that The Haven Project Foundation and the persons and organizations named above are not liable for resulting injury, illness, death, property damage, loss, or expense.

WHEN IN DOUBT: Do not drink questionable water. Use commercially bottled water or another source approved by public-health authorities. Seek medical advice promptly after suspected exposure or illness.

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