

Post-Disaster Guide for Douglas County Residents

Guidance for Douglas County residents following a flood, interruption of water service, sewer backup, electrical or gas outage, fire, or communicable disease. *This guide is meant to provide general recovery guidance and is not all inclusive.*



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INTRODUCTION & LEGAL REQUIREMENTS

Purpose of Guidance: This document provides instructions for homeowners following natural disasters. This document is not intended to provide legal guidance, or to be all inclusive. This document is intended to provide public health guidance for various hazard types for the community at large and may be applicable in multiple settings.

Definition of Hazard: An "imminent health hazard" means a significant threat or danger to health that is considered to exist when there is evidence sufficient to show that a product, practice, circumstance, or event creates a situation that requires immediate correction or cessation of operation to prevent injury or illness based on the number of potential injuries or illnesses and the nature, severity, and duration of the anticipated injury or illness.

How to Use This Guide:

This guide is for after a disaster has already occurred. If you are currently experiencing an emergency and need immediate emergency response, **call 911**. There are many potential health concerns that can occur because of disruptions following a disaster.

This guide is designed to be a practical resource that Douglas County residents can turn to after any type of emergency or disruption. You do not need to read it from start to finish. Look through the table of contents and go directly to the section that matches the situation you're dealing with, such as a power outage, water interruption, flooding, or fire. Each section explains what the hazard is, what steps to take right away, how to stay safe, and when it's appropriate to return to normal activities. Because every household and circumstance is different, use the parts of this guide that apply to you, and skip sections that aren't relevant. This is a flexible tool meant to support your recovery.

Re-entry to Your Home:

Maintain awareness that there may be health associated risks when re-entering a home following a disaster or hazard. Ensure that all hazards have been properly mitigated including hazards such as electrical, air contaminants, communicable disease risks, chemical and hazardous materials (hazmat) risks. Always use appropriate personal protective equipment (PPE) and contact professionals to mitigate risks where necessary.

Additional Resources:

Please access the [Douglas County Resource Guide](#) for general resources such as food assistance, medical care, mental health, transportation, utilities, and legal resources.

BOIL WATER ADVISORY

A Boil Water Advisory is an official notice from your local water district or health department telling you that your tap water may not be safe to drink because it could contain harmful germs. These advisories are issued out of caution to protect public health.

Why a Boil Water Advisory happens

A Boil Water Advisory may be issued when something affects the safety of the water system.

Common reasons include:

- Water main breaks or system damage, which can let contaminants enter the pipes.
- Loss of water pressure, meaning the system can't keep water clean as it usually does.
- Equipment or treatment failures, such as problems at a water treatment plant.
- Natural events, like flooding or other disasters that affect water quality.
- Confirmed or suspected contamination, where testing suggests the presence of bacteria or other harmful substances.

When these issues occur, the safest immediate action is to advise the public to boil their water before using it for drinking or food preparation.

Boil your water before using it for:

- Drinking
- Making ice
- Cooking or preparing food
- Making baby formula or drinks
- Brushing your teeth
- Washing fruits and vegetables
- Giving water to pets

Bring water to a rapid, rolling boil for at least 1 minute (or 3 minutes at higher elevations above 6,500 feet) to kill harmful organisms.

Use alternatives when possible

- Use commercially bottled water for drinking and food preparation.
- Use bottled or boiled water for any food that needs to be rinsed, soaked, or mixed.

Be cautious with kitchen appliances

- Coffee makers can be used if they heat water to **at least 180°F**.
- Throw out ice made from tap water and clean the ice maker in your fridge, if applicable, following manufacturer instructions once the advisory is lifted.

Handwashing

- You can wash your hands with tap water followed by hand sanitizer as an extra precaution. Be aware that hand sanitizer does not destroy certain infectious diseases including norovirus, rotavirus, HPV cryptosporidium, or C. difficile.
- Look for posted signs in public places or businesses reminding staff and visitors of proper precautions.

How you'll know when it's safe again

A boil water advisory stays in place until officials confirm the water system is safe. This happens only after:

- Repairs are complete
- Disinfection steps are taken by water officials and by each homeowner.
- Water quality tests show the system is safe again

Once testing is clear, the health department or water district lifts the advisory and normal water use can resume.

Please note: If you have been notified of a water main break in your area, or if you have any questions, please contact DCHD at 720-643-2400 and follow the phone tree.

INTERRUPTION OF WATER SERVICE OR NO HOT WATER

When your home loses water service or you no longer have hot water it can affect basic daily needs like cooking, cleaning, handwashing, and using the bathroom. Here's what homeowners should know and do during a water interruption.

Why Water Service Matters:

Clean running water is essential for:

- Washing your hands
- Cleaning and sanitizing surfaces
- Washing produce and preparing food
- Using toilets

- Basic hygiene and home sanitation

When water stops flowing, or when only cold water is available, you may need to adjust how you do everyday tasks until service is restored.

What to Do if You Have No Water:

1. Use Safe Drinking Water Sources

If your tap water isn't available:

- Use bottled water for drinking, brushing teeth, cooking, and washing produce.
 - You can also use clean, sealed containers of potable water or water from an approved storage tank.
 - Do *not* use questionable water sources (garden hoses, outdoor spigots on damaged lines, melted ice, etc.).
- #### **2. Bathrooms & Toilets**
- If the water outage lasts **less than two hours**, you may be able to use bathrooms at a nearby location (like a neighbor's home). Limit flushing of toilets during this time.
 - If toilets cannot flush, avoid using them until water service returns, or use alternative sanitation options if available (portable toilet, lined bucket, camping toilet). If alternative options are used, it is important to properly dispose of waste, and disinfect the area using disinfection guidance at the end of this document, followed by thorough handwashing for 20 full seconds with warm, soapy water. Do not excrete or dispose of human waste near bodies of water or streams.

3. Handwashing

Without water:

- Use prepackaged or no prep foods that require no hand contact.
- Rely on alcohol based hand sanitizer until you have access to clean, running water again.
- Avoid preparing foods that require washing your hands multiple times.

What to Do if You Have No Hot Water

Hot water is needed to safely wash dishes, clean surfaces, and maintain hygiene. If your hot water goes out:

- Avoid cooking foods that require extensive cleanup.
- Use disposable plates, utensils, and cups when possible.
- Use commercially bottled water warmed on a stove or with another safe heat source for basic cleaning needs.
- Wait until hot water is restored to wash dishes normally.

1. Food and Cooking Precautions

Without water or hot water:

- Stick to shelf stable, ready to eat items (canned goods, packaged snacks, prepared meals).
- Avoid foods that need washing, rinsing, or detailed prep.
- Use only commercially manufactured ice, do not use ice that was made from your tap during the outage.
- Hold off on using fountains, soda machines, or home beverage dispensers that rely on tap water.

2. Cleaning and Sanitizing

If you can't properly wash, rinse, and sanitize dishes or surfaces:

- Avoid cooking or handling foods that require kitchen cleanup.
- Use single use plates and utensils.
- Wait to clean equipment and dishes until safe, potable water is restored.

After Water Service Returns

Once water is back on, there may be air in the pipes or possible contamination if the outage was caused by a main break.

When water service resumes:

1. Run cold water for several minutes to clear lines.
2. Follow any instructions from your water provider (flushing steps, testing updates, boil advisories).
3. Wash and sanitize (refer to the sanitization and disinfection section of this document) dishes, equipment, and surfaces before returning to normal use.

RUSTY/BROWN WATER

Occasionally tap water from municipal water supplies may shed rust, causing the water to temporarily turn a red or brown color. Usually, the cause is due to occasional sloughing of common iron rust from the inner surfaces of drinking water pipes. This is most common in areas where unlined cast iron pipes are still used. Changes in water pressure or flow in the drinking water distribution system due to the use of fire hydrants, construction projects, heavy water use in particular areas, or activities like a water main break can cause the water to be temporarily shut off and on, dislodging rust.

Eliminate Discoloration

- Run several cold water taps at full force for 15 minutes to help flush the rusty water out of the system. If the water is not clear after this time, wait 30 minutes and then run the water again for another 15 minutes.
- If the water still hasn't cleared after this, contact your drinking water provider.

- Avoid using hot water as much as possible to help keep rusty water out of the hot water heater or boiler.

Use Alternative Water Sources

There are no known health hazards associated with rusty water; however, due to unpleasant taste and appearance, it is recommended that you:

- Wait until the water has cleared before consumption, including preparing any foods requiring water.
- Avoid washing food-contact surfaces and kitchen tools, including running dish washers until the water clears.
- Use an alternative source of bottled water for consumption, preparation of food, and cleaning of kitchen tools.

SEWAGE BACKUP & SEPTIC SYSTEMS

SEWAGE BACKUP

Sewage backups present unpleasant odor problems and may cause property damage and unhealthy living conditions. Untreated sewage contains disease-causing germs such as bacteria, viruses, and parasites. Contact with contaminated water can cause skin infections and rashes. If ingested accidentally via improperly cleaned hands or food preparation surfaces, these contaminants can cause nausea, abdominal pain, vomiting, and diarrhea.

[Cleanup After a Sewage Backup](#)

Sewage Health Risks

Mold growth associated with wet and humid conditions may also result in respiratory infections and allergic reactions. The drying-out process can take several weeks in an enclosed area such as a basement or crawl space, and microorganism growth will continue as long as the humidity remains high. A musty odor can remain long after the sewage overflows if the damaged area is not cleaned and dried out properly.

Contaminated Materials Outside the Home

If there is a broken sewer line outside the home or in a crawl space under the home, and you must access it or be in a sewage contaminated area, put on protective clothing such as:

- Waterproof boots
- Gloves
- Eye protection
- Clothes that are either washable or disposable
- [N95](#) masks to avoid breathing airborne microorganisms

SEPTIC SYSTEMS

Septic Systems, known as Onsite Wastewater Treatment Systems (OWTS) After a Disaster

Check on Your OWTS After a Fire, Flood, or Other Natural Disaster

Consider the state of your septic system once the natural disaster has passed and it is safe to return to the area. This will help maintain clean, healthy waters in Douglas County. Unapproved, aging, and failing septic systems significantly impact the quality and safety of our water supply. If your property was flooded, affected by fire, or other natural disaster, please walk the area of your onsite wastewater treatment system (OWTS) and look for signs of system failure. If you identify damage contact DCHD Environmental Health at 720-643-2400.

Signs of Septic System Damage and Potential System Failure

- There is a change in grading in the area of the septic system.
- An area of the septic system has collapsed.
- There is significant erosion in the area of the septic system.
- There are signs of exposed gravel, tire chips, or chambers in the absorption bed/trench.
- Parts of the septic system (absorption bed/trench, septic tank, pipes) are exposed or damaged.
- Electrical components or wiring in a lift/pump tank are inundated with water from a flood or destroyed by heat from a fire.
- There are sewage back-ups or prolonged sewage drainage inside the home.
- There is pooling, flowing, or surfacing sewage from the septic system.

Additional Guidance

After assessing your OWTS, you may still have questions regarding the functionality of your system. Contact a NWAT Certified inspector to provide inspections of systems. Contact DCHD for a list of approved inspectors.

WELL WATER FOLLOWING A DISASTER

Well Water Safety

Water wells may have been destroyed or compromised due to recent flooding, fire, power outage or other natural disasters. You may need to take action by:

- Decontaminating the well
- Perform follow up testing to confirm it's safe for use once floodwater has receded.
- Replacing the well's pump
- Repairing the well structure

- Replacing the well
- Some combination of these actions

Do Not Use Potentially Contaminated Water

Water from impacted wells should be considered contaminated. Do not use water from a well that has experienced structural damage, power loss, or impact from a natural disaster. Intense heat can compromise above ground components, while flooding may contaminate the well. **Contaminated water is not safe for drinking, cooking, washing dishes, making ice, brushing teeth, or even bathing until you have confirmed that it is safe.**

Residents who are concerned about their well water should follow these steps:

- Boil or use bottled water for drinking, making ice, brushing teeth, washing dishes, and preparing food.
- Boil water for three minutes.
- Cool before using.
- Store in sterile-covered containers.

Decontamination

1. Bleach Disinfection

Residents can disinfect water using bleach. Bleach will kill some, but not all, types of disease-causing organisms.

- Follow the labeled instructions for disinfection and time which the solution needs to sit (dwell time) as concentrations may vary across brands.
- Store disinfected water in clean, covered containers.

A bleach/water rinse after dishwashing can remove any bacterial contamination until the well can be remediated. For dishwashers, set the water heater to 160°F.

- Soak dishes in clean water (bottled or boiled) mixed with several tablespoons of unscented chlorine bleach or follow instructions on the product label.
- After the time designated on the products label has passed, remove the dishes and let them air-dry without rinsing.
- Bathing and showering with unsafe well water is not recommended. If doing so, flush out the water heater once first. Do not get water into your eyes, ears, nose, or mouth, and cover any open wounds.

Fridge filters should also be replaced if well water is contaminated.

Well Cleanup Safety Precautions

Clear hazards away from wells before cleaning and disinfecting wells and follow these precautions:

- Turn off all electricity to the well before clearing debris. Do not attempt to repair the electrical system unless you are experienced with this type of work. Inspect all electrical connections for breaks in insulation and for moisture. Connections must be dry and unbroken to avoid electric shock.
- Carefully inspect the area around the well for hazards such as:
 - Power lines on the ground or in the water
 - Sharp metal
 - Glass
 - Wood debris
 - Open holes
 - Slippery conditions
- Do not enter the well pit. Gases and vapors can build up in well pits, creating a hazardous environment.
- Before the power is turned back on, a qualified electrician, well contractor, or pump contractor may need to check the equipment wiring system.
- When working with chlorine/ bleach solutions, wear rubber gloves, protective goggles, or a face shield and a protective apron.
 - Work in well-ventilated areas and avoid breathing vapors when mixing and handling chlorine solutions.

2. Disinfection of Wells

[Disinfection of Wells After an Emergency](#) (CDC)

- Start the pump and run the water until it is clear. Use the outside faucet nearest the well to drain the potentially contaminated water from the well and keep unsafe water out of the interior household plumbing. If no pump is installed, bail water until clear.
- Close valves to any interior plumbing water.
- Using a 5-gallon bucket, mix the bleach according to the size of the well with 3-5 gallons of water.
- Remove the vent cap.
- Pour the bleach water mixture into the well using a funnel. Avoid all electrical connections. Attach a clean hose to the nearest hose bib and circulate water back into the well for thorough mixing.
- Rinse the inside of the well casing with a garden hose or bucket for 5-10 minutes.

- Open all faucets inside the home and run the water until you notice a strong odor of chlorine (bleach) at each faucet. Turn off all faucets and allow the solution to remain in the well and plumbing for at least 12 hours.
- Attach a hose to an outside faucet and drain the chlorinated water onto a non-vegetated area such as a driveway. Continue draining until the chlorine odor disappears. Avoid draining into open sources of water (streams, ponds, etc.).
- Turn on all indoor faucets and run water until the chlorine odor disappears.
- Repeat testing of water.

3. Pump Replacement

If a well requires replacing the existing pump, no permitting process is necessary. The [Colorado Division of Water Resources](#) (DWR) recommends that well owners work with a licensed water well contractor to replace the pump.

4. Well Structure Rehabilitation or Replacement

A well may need additional repair before being operational, in addition to a new pump. If the well can be repaired and put back into use, a well permit is not needed.

If a well must be reconstructed, a permit for a replacement well must be obtained prior to redrilling the well. A licensed water well contractor can help determine whether the well can be repaired or needs to be replaced. Any additional questions may be directed to the Colorado Department of Public Health and Environment (CDPHE).

ELECTRICAL OUTAGE OR PLANNED SAFETY POWER SHUTOFF (PSPS)

Power outages, whether sudden or planned for safety reasons, can affect more than just your lights. Losing electricity impacts food safety, heating, cooling, ventilation, and your ability to safely use appliances. Here's what homeowners need to know to stay safe and protect their household during an outage.

Electricity is essential for:

- Keeping food cold and safe
- Running electric hot water heaters
- Powering stoves, microwaves, and cooking equipment
- Ensuring ventilation systems work properly
- Allowing safe lighting

When the power goes out for more than a short time, you may need to take extra precautions to prevent foodborne illness and other hazards.

FOOD SAFETY

Keep Refrigerator and Freezer Closed

To maintain cold temperatures:

- Keep doors closed as much as possible
- A refrigerator can keep food cold for about 4 hours if the door remains unopened
- A full freezer holds temperature for 48 hours (24 hours if half full)

In general, if the power is out for less than two hours, food kept in a refrigerator or freezer should be safe to eat.

What to Throw Away

You should **discard**:

- Any refrigerated foods above 41°F for more than **four hours**
- Any food with signs of spoilage, leakage, unusual odors, or questionable safety
- **When in doubt, throw it out.**

What Can Be Saved

- Frozen food that remained frozen solid
- Refrigerated items that stayed below 41°F

After power returns:

- Check appliance temperatures
- Clean and sanitize any surfaces contaminated by thawed or leaking food

If your home has been without electricity for four hours or more, follow the food product Salvage Evaluation Chart.

When in doubt, throw it out! *Food must be in sound condition, free from spoilage, temperature abuse, filth, or contamination to be fit for human consumption.*

Electrical Outage or PSPS		
Food Product	Action	Explanation/ Instruction
Refrigerated foods at greater than 41°F for less than 4 hours	Salvage	Must be iced or moved to a properly functioning refrigerator unit
Frozen foods that remained frozen and did not thaw.	Salvage	
Partially thawed frozen foods that remained under 41°F.	Salvage	Must be moved to a properly functioning refrigerator unit or cooked immediately. Do not

		refreeze foods that have partially thawed.
Improperly cooled or hot held foods.	Discard	Food in the 41°F-135°F temperature range can produce dangerous pathogens and toxins.
Refrigerated foods at greater than 41°F for more than 4 hours.	Discard	Food in the 41°F-135°F temperature range can produce dangerous pathogens and toxins.

Cooking and Kitchen Appliances

Avoid cooking foods that require:

- Refrigeration afterwards
- Multiple steps for cooling/reheating
- Hot holding

If you must prepare food:

- Use prepackaged, shelf-stable options
- Use outdoor grills outdoors only, never inside garages or near doors/windows

If your stovetop or oven is electric:

- Switch to meals that can be eaten cold or prepared with an alternative heat source

Hot Water & Home Heating

If you rely on an electric water heater:

- You won't have hot water during the outage
- Delay dishwashing, heavy cleaning, or any tasks requiring hot water

If you rely on electric heat:

- Keep warm with blankets, layered clothing, and safe heating alternatives
- Never use generators or fuel-burning heaters indoors due to carbon monoxide risk
- If you require help, have access and functional needs, or cannot stay in your home due to an outage contact Douglas County Sheriff's Office.

Ventilation and Air Quality

If your ventilation system isn't working:

- Avoid cooking that produces grease, steam, or smoke
- Open windows for airflow if outdoor air quality is safe

Lighting

Without proper lighting:

- Use flashlights instead of candles to avoid fire hazards
- Be cautious when moving around your home
- Clean only what you can clearly see

Generators

- Never use generators, pressure washers, or other gasoline-powered tools indoors. They all produce large amounts of Carbon Monoxide (CO) that can build up to dangerous levels in minutes.
- Keep generators outside; however, keep generators away from windows, doors and air intakes
- Follow Manufacturer Instructions.

NATURAL GAS OUTAGE

A natural gas outage can affect heating, hot water, and your ability to cook. It's important to know what to do to keep your home safe and functioning until service is restored.

What Happens During a Natural Gas Outage

If your home uses natural gas for:

- Hot water
- Home heating
- Cooking

Those systems may stop working during an outage. Even if electricity is still available, gas-powered appliances will not function until natural gas service returns.

Hot Water

If your water heater runs on natural gas:

- You will not have hot water during the outage.
- Postpone activities that require hot water, such as heavy dishwashing or long showers.

For basic needs:

- Use bottled or boiled water for washing hands or cleaning.
- Consider using disposable plates and utensils until hot water returns.

Heating Your Home

If your furnace uses natural gas:

- Your home may get cold quickly, especially in winter.
- Use safe alternative heat sources, such as:
 - Extra blankets and warm clothing
 - Electric space heaters (if used safely and with working smoke detectors)
- Never use ovens, stovetops, grills, or generators as indoor heat sources. They create deadly carbon monoxide.

Cooking

If your stove or oven uses natural gas:

- Switch to foods that don't require heating, or use electric appliances like:
 - Microwave
 - Toaster oven
 - Electric kettle
 - Hot plate (used safely on a stable surface)

All foods must still be cooked to safe internal temperatures if heating is required.

Signs of a Gas Leak (Important Safety Note)

Natural gas outages sometimes occur because of damage to gas lines. Even when the gas is turned off, damaged lines or residual gas can create risks.

If you smell gas or suspect a leak:

- Leave the home immediately.
- Do not turn lights on or off.
- Do not use phones inside the house.
- Do not start a car in the garage.
- From a safe location, call your gas utility or 911.

Once outside:

- Keep everyone away from the home until emergency personnel say it is safe.

When Gas Service Returns

After the outage ends:

1. Follow all instructions from your gas company.
2. Re-light pilot lights only if you know how, otherwise request technician assistance.

3. Ensure all appliances are working safely before cooking or heating normally.
4. Check for unusual smells or sounds from gas appliances.
5. If you have an electric water heater backup, flush and reset it according to instructions.

FIRE

A fire, no matter the size, can leave behind hidden hazards like smoke residue, chemicals, and spoiled food. After a fire, it's important to understand what is safe, what must be thrown away, and what steps to take before re-entering or cleaning your home.

Smoke & Chemicals Used to Fight Fires

Chemicals used to fight fires contain toxic materials that can contaminate food and cookware. While some of the chemicals may be listed as nontoxic to humans, they can be harmful if swallowed. These chemicals cannot be washed off food.

Smoke contains harmful particles that can settle on and contaminate food, dishes, counters, and soft materials like linens or paper goods. Fire-Fighting chemicals can also make these items unsafe. Items that cannot be washed and sanitized like paper goods, opened packages, or porous containers should be thrown away.

Smoke and soot can enter your ventilation system. Be sure to replace air filters before running heat or AC systems. Consider having the ducts inspected if the fire occurred close to the vents or if the system was running at the time.

Power Outage

Refrigerated items should be discarded if the electricity has been off for more than four hours. See the Electrical Outage and PSPS section.

Cleaning Surfaces After a Fire

- Wash and disinfect all kitchen surfaces using a chlorine/bleach solution following the instructions of the product manufacturer. See more information in the general sanitization & disinfection guidance of this document.
- Remove any debris, soot, or damaged materials.
- Wear gloves and proper protective gear while cleaning.
- If a sewage backup occurs during emergency response, follow the sewage backup guidance listed in the sewage backup section.

Post-Fire Re-Entry Checklist

- Do not re-enter the home until the local fire authority explicitly declares the home safe.
- Ensure water and wastewater systems are working properly.
- Discard unsafe foods.
- Verify refrigerators and freezers are working and maintaining proper temperatures.

- Clean any surfaces touched by smoke, runoff, or chemicals.
- Re-stock only clean, safe food and supplies.

Food Safety Following Fire

Discard food in cans or jars if they have been close to the heat of a fire. Heat from a fire can activate food spoilage bacteria. If the heat is severe, the cans or jars can split or rupture and are not safe to consume. Food can easily be contaminated by heat from the fire, smoke and toxic fumes, fire-fighting chemicals, and or power outages affecting your refrigerator or freezer.

Throw away any food exposed to smoke, heat, or chemicals. Throw away any opened food stored in paper, cardboard, or cloth, any produce or unprotected food items and canned goods that are leaking, dented, rusted, bulging or have damaged seams. Also, throw away any refrigerated or frozen foods that have been kept at 41°F for more than four hours. If the food looks, smells, or feels “off” throw it away.

Fire		
Food Product	Action	Explanation/ Instruction
Leaking, dented, rusty, or bulging airtight sealed containers (cans, pouches).	Discard	Possible presence of pathogenic bacteria that can produce deadly toxins. In addition, do not use any food products that have a foul odor or any container that spurts liquid when opening.
Foods in closed coolers or freezers.	Make determination upon visual inspection of smoke damage, or discard if unsure.	Evaluate space for smoke damage or temperature abuse
Exposed food products, produce.	Discard	Subject to contaminants in smoke and fire suppression chemicals.
Food in paper, cardboard, cloth containers, single services items or other penetrable package.	Discard	Any open food or food in penetrable packaging can be contaminated.
Food in sealed, plastic container if it can be cleaned without contaminating contents.	Salvage	
Airtight sealed containers (cans, pouches) with no heat damage.	Salvage	No bulged ends or ruptured seams; use a clean cloth or tissue to remove any residue on container. Sanitize according to guidance at the end of this document.

FLOOD

GENERAL HEALTH AND SAFETY

Floodwater can contain sewage, industrial waste, bacteria, and other harmful germs. Mold may also be a concern after a flood. All these contaminants can pose severe health hazards.

Assume that all floodwaters and anything that is wet with floodwater is contaminated.

Additional information regarding sewage backup and septic systems and wells can be found in the sewage backup and septic systems and wells sections, respectively.

Use Personal Protective Equipment (PPE)

1. Protect Your Lungs

Anyone engaged in cleanup should wear respiratory protection, particularly if the cleanup occurs after the materials have dried out. A disposable particulate respirator certified by the National Institute for Occupational Safety and Health (NIOSH) will offer some protection if properly worn. The best lung protection is a respirator with chemical **and** particulate cartridges.

Commonly available one-strap paper dust masks, designed to keep larger particles out of the nose and mouth, typically offer little protection. The same applies to bandannas (wet or dry) tied over the mouth and nose.

2. Air Circulation

Open windows and doors and use fans to circulate air during and after disinfecting, cleaning, and sanitizing belongings or appliances. Refer to the general sanitization and disinfection guidance at the end of this document for further guidance.

Items that cannot be sufficiently decontaminated such as upholstered furniture need to be discarded.

3. Protect Your Skin

Waterproof gloves are crucial safety equipment. Nitrile gloves are usually acceptable, but if hazardous chemicals are present in the water, nitrile may not provide enough protection, and more heavy-duty gloves will be needed. When working with sharp objects that may tear your gloves, heavy-duty gloves will provide more protection.

If flood water is suspected to contain hazardous chemicals, wear chemical-resistant outer clothing that offer protection against hazardous particles and goggles (NOT safety glasses). Wear rubber or plastic boots and plastic (PVC rubber or nitrile) gloves and consider duct-taping protective clothing openings to keep water out.

Wash your hands with soap and clean running water when removing gloves, especially before breaks, meals, and at the end of a work session. If you have any open cuts or sores exposed to floodwater, wash them with soap and water and apply an antibiotic ointment to discourage infection.

Seek medical attention for cuts that become infected.

Homes with Minimal Damage

If the home has minimal damage and the overflow can be cleaned up promptly, the damaged area may need to be cleaned and disinfected. This involves thoroughly washing and disinfecting the damaged area's walls, floors, closets, and other washable contents.

In most cases, everyday household cleaning products and disinfectants will do the job if used correctly. Disinfectants and sanitizers often contain toxic substances, so read and follow all label instructions carefully. Be careful about mixing household cleaners and disinfectants since some can produce harmful vapors. For example, mixing bleach and ammonia forms the toxic gases chloramine and ammonium chloride.

Homes with Extensive Damage

If the damage was extensive or the overflow could not be cleaned up promptly, removing and replacing damaged wallboard and wall insulation should be considered to avoid indoor air quality problems later. The wallboard acts like a sponge, drawing moisture up above the water level. It becomes very fragile if it stays wet for long and will fall apart when bumped.

Suppose asbestos-containing materials are known to be present in flood debris in amounts above the safe regulation level. In that case, they must be removed per [Colorado Air Quality Control Commission Regulation No. 8, Part B](#).

Even if the area is dried out, contaminants may have gotten up behind the drywall and dried inside. Mold can penetrate deep into soaked, porous materials such as wood, insulation, and drywall and continue to damage these materials long after the overflow event is over. Even after everything has dried out, microorganisms can be released into the air later, triggering allergic reactions when inhaled.

Wooden wall studs and sills probably won't need to be replaced if thoroughly cleaned, disinfected, and allowed to dry correctly. Since they will be covered by new wallboards and painted, they will be removed from direct human contact.

If the walls are paneled, the bottom of each panel should be carefully pried away from the wall. A block or something similar should be used to hold the paneling bottom away from the wall sill so that the area between wall studs can drain and dry out. The paneling may have to be removed entirely to remove any wet insulation or extensive contamination behind it.

Once disinfected and dried out, the paneling can often be nailed back into place. Wastewater won't damage concrete like wood or wallboard, but it will still soak in to some extent. Concrete walls and floors should be washed thoroughly and allowed to dry out.

POST- FLOOD FOOD SAFETY

Potentially Spoiled Food

Throw out all food and other supplies that you suspect may have become spoiled due to a power outage or have become contaminated by floodwater, including:

- Food from refrigerators and freezers, including condiments.
- Dry food in damaged packages.

Perishable Food

- Discard any perishable food that has been held at temperatures above 41°F for more than 4 hours.
- Place food waste and other waste that rots or decays into plastic bags and place them in a designated area for separate collection. When in doubt, throw it out.
- Keep the refrigerator and freezer doors closed as much as possible to maintain the cold temperature.
- The refrigerator will keep food cold for about four hours if it is unopened.
- A full freezer will keep the temperature for approximately 48 hours (24 hours if it is half full) if the door remains closed.
- If the power is going to be out for a prolonged period, buy dry or block ice to keep the refrigerator as cold as possible. Fifty pounds of dry ice should keep an 18-cubic-foot fully stocked freezer cold for two days.
- If you plan to eat refrigerated or frozen meat, poultry, fish, or eggs while it is still at safe temperatures, each item must be thoroughly cooked to the proper temperature to ensure that any foodborne bacteria that may be present is destroyed. However, if at any point the food was above 40 °F for two hours or more discard it as it cannot be saved regardless of how hot the food it cooked.
- Wash fruits and vegetables with water from a safe source before eating. If they have been impacted by floodwaters discard them.
- For infants, try to use prepared, canned baby formula that requires no added water. When using concentrated or powdered formulas, prepare with bottled water if the local water source is potentially contaminated.
- Foodborne illness often presents as flu-like symptoms such as nausea, vomiting, diarrhea, or fever. If you experience these symptoms, contact your healthcare provider.

Food Product Disposal:

Discard all food and packaging materials that have been submerged in flood waters unless the food is sealed in a commercially sealed can that has not been damaged. *If in doubt, throw it out!*

- Discard all refrigerated and frozen foods (e.g. meat, poultry, shell eggs, egg products, and milk) that have been immersed in flood waters.
- Inspect all canned foods and discard any damaged cans. A can is considered damaged if it is swelling; leaking; punctured; fractured; has extensive deep rusting; or was crushed/dented severely enough to prevent normal stacking or opening with a manual, wheel-type can opener.

- Discard products in containers with screw caps, snap lids, crimped caps (e.g. soda bottles), twist caps, flip tops, snap open, and similar closures that have been submerged in flood waters.
- Discard food packed in paper, cardboard, cloth, single service items or similar containers that have received water damage.
- Undamaged, commercially prepared foods in all metal cans or retort pouches can be saved if the labels are removed and they are thoroughly washed, rinsed, and disinfected. Relabel the containers with a marker and include the expiration date.
- Ensure disposal of food items is done according to state, and local guidance provided in response to the emergency. For further guidance see the Food Product Evaluation Guide at the end of the document for a summary of disaster specific food disposal guidance.

Flood/ Water Damage		
Food Product	Action	Explanation/ Instruction
Fresh fruits and vegetables	Discard	Contaminants can be absorbed by produce
Submerged or splashed screw-top, crimped-cap, twist-cap, pop-top containers	Discard	Not cleanable under/around caps. Containers returned for deposits or recycling must be drained
Submerged permeable (paper, cardboard, cloth, plastic etc.)	Discard	Inadequate barrier to contaminants and water.
Leaking, dented, rusty, or bulging airtight sealed containers (cans, pouches)	Discard	Possible presence of pathogenic bacteria that can produce deadly toxins. In addition, do not use any food products that have a foul odor or any container that spurts liquid when opening
Alcoholic Beverages (closed with cork, screw-top, twist-top, crimped cap)	Discard	
Submerged or splashed airtight sealed containers (cans, pouches)	Salvage	Relabel, if necessary, by removing label; wash, rinse, sanitize (50-200 ppm chlorine), dry, relabel with all required information and codes

FLOOD DEBRIS & REMOVAL

Safely Dispose of Contaminated Materials in the Home

Sewage-exposed materials must be thoroughly cleaned and disinfected to reduce the risk of disease. Refer to the sewage backup session at the beginning of this document for further information.

- Wear protective clothing, as noted previously.

- Open the house and remove standing wastewater with a mop, wet vac, or squeegee to lower the humidity.
- Open closets and cabinets to allow circulation.
- Circulate the air using fans, dehumidifiers, and window air conditioners. However, if standing wastewater does not impact the air ducts, only whole-house air conditioners or furnace blowers should be used.
- Purchase moisture-absorbing products from home repair or lumber stores and place them in enclosed areas where air cannot pass through.
- Sort the contents of the damaged area to separate salvageable furnishings from unusable debris.
- Throw away contaminated mattresses, pillows, foam rubber items, upholstered couches, chairs, books, and most paper products because they soak up contamination and are difficult to disinfect.
- Hire a professional cleaning company to steam clean and disinfect salvageable furnishings exposed to wastewater that cannot be thoroughly steam cleaned or disinfected.
- Dispose of material exposed to wastewater that cannot be thoroughly steam-cleaned or disinfected.
- Discard all potentially contaminated food items, cosmetics, stuffed animals, and baby toys.

1. Washing Soiled Items

When in doubt, throw it out. Spoiled clothing and small throw rugs should be thoroughly washed in warm or hot water, with bleach if possible. Discard more oversized rugs and those with foam backing.

After getting wet, wall-to-wall carpeting usually does not return to its former size and must be thrown away. If only a portion of the carpeting is damaged, a professional carpet cleaner may adequately clean it. However, the foam padding will likely have to be replaced.

2. Preparing Items for Disposal

Discarded items should be sealed in heavy plastic garbage bags before disposal. Your trash collection company should be contacted about removing furniture and bulky furnishings, or the homeowner can take these items directly to a landfill.

3. Preparing Materials for Removal

Care should be taken when handling any materials from buildings that are damaged by flood water. Protective clothing and equipment should be worn to avoid skin contact and inhalation of disturbed material. All debris should be handled in a manner that will minimize exposure to any hazardous materials that could be present in the debris.

Those participating in cleanup activities should ensure they are up to date on all vaccinations, particularly tetanus by contacting their healthcare provider.

4. Transporting Debris to Landfills

Landfills should be informed that materials are coming from the flood area. Contractors should consult with the Occupational Safety and Health Administration (OSHA) at 303-844-5285 to determine required training and personal protective equipment for those handling this material.

5. Asbestos

If asbestos-containing materials are known to be present in flood debris in amounts greater than regulatory trigger levels, they must be removed in accordance with Colorado Air Quality Control Commission Regulation No. 8, Part B. Trigger levels for single family residential dwellings are 50 linear feet on pipes, 32 square feet on other surfaces or the volume equivalent of a 55-gallon drum. If this is not known, the material may be handled as non-asbestos flood debris and disposed of at a permitted landfill.

6. Permits

Flood debris may contain unknown substances, including chemicals. Take care when handling any materials from buildings that either are partially damaged by the floods (i.e., salvageable building materials remaining) or completely destroyed (i.e., only debris remains). Check with local authorities to determine whether a permit for removing debris is necessary.

All debris should be handled in a manner that will minimize potential exposure to both the people handling the material and those in the surrounding area.

7. Illegal Dumping

Flood debris should not be placed on roadsides as it will not be collected. Placing debris on the roadside may be considered illegal dumping, which can be subject to penalty.

8. Hazardous Material & Waste Management

Douglas County has limited pickup options for household pickup for hazardous waste. Visit the [Household Waste Management Program](#) page to learn more.

MOLD FOLLOWING A FLOOD

Mold Cleanup

Failure to remove contaminated materials and reduce moisture and humidity after a flood can present serious long-term health risks. Standing water and wet materials are breeding grounds for microorganisms, such as viruses, bacteria, and mold. These can cause disease, trigger allergic reactions, and continue to damage materials long after the flood.

Property Manager and Landlord Requirements

Landlords must fulfill specific legal requirements ([Warranty of Habitability, CRS 38-12-503](#)) that make a rental property fit for human habitation. Flooded buildings must be thoroughly dried, and evaluations must be conducted during and after remediation. Property managers should conduct a visual inspection and document remediation efforts to ensure properties have been properly remediated to prevent mold health problems.

Environmental Sampling

Environmental sampling for mold can help to determine the extent of the problem, the location of mold, and the quality of the remediation. However, sampling for mold cannot be used to determine if a building is “safe” because there are no quantitative, health-based guidelines that describe “safe” levels for microbial exposure to mold. Instead, property owners and managers should conduct a visual inspection and document remediation efforts to ensure appropriate steps have been taken to prevent mold health problems.

Indoor Air Contamination (Mold, Bacteria & Viruses)

Review these resources for guidance on what to look for and steps to take to ensure your home is safe:

- [Field Guide for Cleanup of Flooded Homes](#)
- [OSHA Mold Factsheet](#)
- [Flood Cleanup Booklet](#) (EPA)

FLOOD CONTAMINATED SOIL

Contaminated Soil

Plastic ground liners, surface contamination, and heavily contaminated soil should be removed from the impacted area if possible. When removed, contaminated soil should be disposed of in an approved landfill. The remaining contaminated soil should be treated with a liberal application of garden lime also known as agricultural lime to reduce odor and enhance the degradation of the organic matter. This may be purchased at home goods stores.

If the contaminated area is in the open, it should either be covered with clean dirt or temporarily fenced off to prevent accidental contact with the lime and any remaining contamination. After a day or two, mix the lime in with a rake and use a sprinkler or hose to water the lime and any remaining residues into the soil. Prevent water or soil from entering stormwater by containing it onsite or disposing of it in an approved landfill or wastewater dump station. Let the area dry in the sun, if possible, before allowing access.

Excavated soils may be remediated onsite by treatment with garden lime, which should be turned over frequently to provide oxygen to the naturally occurring microbes in the soil that degrade the organic material. If onsite treatment is not possible or cannot be accomplished without creating a nuisance condition, contaminated soils and other materials removed from the impacted area may be disposed of at any landfill willing to accept them.

Play Areas Safety & Health

Flood waters can carry dangerous chemicals or materials (e.g. broken glass and metal) and may contain bacteria that can cause illness. Outdoor play equipment and loose materials that came in contact with flood waters can harbor these organisms, even after flood waters recede, making them unsafe. Below are some simple guidelines to help protect children at play following a flood:

- Ensure that flood waters have receded.

- Do not allow children to play in areas that were or might have come in contact with flood waters.
- Disinfect playground areas before permitting children to use them (dispose of all wastewater from cleaning into your household drain; do not put in an outside sewer.)
- Inspect equipment to ensure that it isn't damaged; do not use damaged equipment.
- Remove and replace organic materials like woodchips.
- Remove and replace, or disinfect, sand and silt.
- Encourage children to wash their hands thoroughly after playing on equipment.
- Remove all debris from within the play area.
- Sunlight reduces the concentration of bacteria in sediment; therefore, spread out as much of the remaining sediment as possible to dry.

Gardening in Soils that Have Been Flooded

1. Soil & Gardening After a Flood

Flood waters can carry dangerous materials and may contain bacteria. It is best to till the soil and wait 90 days between flooding and planting fruits and vegetables and/or test the soil before planting (see below). This allows time for anything deposited on the soil to be exposed to sunlight, rain, air, and other conditions that reduce the likelihood that bacteria and viruses will still be present. Chemical substances in flood water were likely diluted and should be at low levels.

2. Soil Testing

If you don't see signs of chemical contamination, it is likely not a concern.

Signs include:

- Staining or sheens
- Distressed vegetation
- Noticeable chemical odors

If your garden area comes in contact with flood waters or sediment or you think your planting area may contain high levels of chemicals, the only way to know for sure is to have the soil tested by a certified laboratory. This can be expensive, however, and test results can be hard to interpret. So, it is best to avoid planting in those areas until you are sure it is safe.

If you do decide to test, the following Colorado labs offer relevant soil testing:

- [Colorado State University Soil & Water Laboratory](#) conducts mineral and metals testing.
- [Colorado Department of Public Health & Environment Laboratory](#) tests for chemicals, oil, volatile compounds, and mining waste.

If you have produce or consumable plants that have been exposed to flood waters or chemical contamination do not consume these items and dispose of them.

HAZARDOUS MATERIALS (HAZMAT)

For your own protection, if there is the potential for hazardous materials or gas leaks within the home, do not enter any damaged dwellings until they have been cleared by proper authorities. Use appropriate personal protective equipment (PPE) to avoid exposure to mold-contaminated materials/environments or other recognized hazards. Disinfection guidance is provided later in this document which is intended to be used for the removal of germs following cleaning after any incident.

CHEMICAL INCIDENTS & NOXIOUS FUMES

Chemicals can contaminate the air we breathe, along with water, food, surfaces and people. Appropriate clean-up is dependent on the cause of the noxious fumes. To minimize exposure to hazardous materials individuals should be properly instructed in their use. All hazardous materials should be stored in their original container, properly labeled and only used according to directions. Hazardous materials like cleaning solutions and chemicals should always be stored in separate well-ventilated areas away from heat and food. For example, everyday chemicals such as bleach can become toxic when mixed, stored or used improperly.

GENERAL SANITIZATION & DISINFECTION GUIDANCE

Regardless of the disaster, chemical disinfection and sanitization procedures are used on household appliances and structural surfaces that are salvageable. When disinfecting, do so in a manner that eliminates any harmful microorganisms, chemical residues, or filth that could pose a risk to food safety. The following bleach guidelines are referenced throughout this document.

Sanitizing reduces germs to safe levels (99.9%+) on surfaces, often used for food-prep items. Disinfecting kills a broader spectrum of bacteria and viruses, making it better for high-touch, illness-prone areas. **Sanitize** to reduce pathogens quickly; **Disinfect** to eliminate them almost completely.

Sanitizing methods to reduce germs to public health standards is ideal for dishes, toys, countertops, and focuses on bacteria rather than viruses. Additional care may be required if known viral concerns exist in your dwelling following a disaster such as if a family member has norovirus.

Disinfection kills viruses and bacteria on hard, non-porous surfaces. Disinfection is necessary when someone is ill, and for areas such as bathrooms and sinks.

To begin sanitizing or disinfecting you must have a clean surface to make the process effective. Clean with soap and water prior to sanitizing or disinfecting. Additionally, disinfectants often require a longer time to sit wet on a surface (dwell time) than sanitizers. Be sure to follow labeled instructions for proper and effective use.

Examples of common sanitizers include surface sprays such as Lysol, or tide antibacterial fabric spray, rubbing alcohol mixes, and bleach/water mixes. Be sure to follow labeled instructions for proper and effective use. Examples of common disinfectants include bleach/ water mixes, alcohol solutions containing at least 70% alcohol, and others. Never mix two chemicals together. Please see the Centers for Disease Control and Prevention's Water, Sanitation, and environmentally related hygiene [guidance](#) for additional information.

Cleaning is done with water, soap, and scrubbing and removes germs, dirt, and grime from surfaces.

Disinfecting products kill any remaining surface germs.

Before using bleach

- First, clean visibly dirty surfaces with household cleaners containing soap or detergent before disinfecting with household bleach.
- Make sure you have good ventilation while using bleach products indoors (for example, open windows and doors to allow fresh air to enter).
- Check to see if you need to wear any protective equipment, such as gloves or eye protection.

Preparing a diluted bleach solution

- Use regular unscented household bleach. Most household bleach contains 5%–9% sodium hypochlorite. Do not use a bleach product if the percentage is not in this range or is not specified. This includes some types of laundry bleach or splashless bleach, which are not appropriate for disinfection.
- Follow the label directions on the bleach product. Check to see if you need to wear any protective equipment, such as gloves or eye protection.
- Follow the directions on the bleach bottle to prepare a diluted bleach solution. If your bottle does not have directions, you can make a bleach solution by mixing:
 - 5 tablespoons (1/3 cup) of bleach per gallon of room temperature water or
 - 4 teaspoons of bleach per quart of room temperature water

Using the bleach solution

- Always follow the manufacturer's instructions for applying the bleach solution to surfaces. If instructions are not available, leave the diluted bleach solution on the surface for at least 1 minute before removing or wiping. This is known as the "contact time" for disinfection. The surface should remain visibly wet during the contact time.
- Wash hands after cleaning or disinfecting.
- Make a new diluted bleach solution daily. Bleach solutions will not be as effective after being mixed with water for over 24 hours.

Chlorine test strips can be used to confirm that you have mixed the correct concentration of the bleach solution. If you test and the concentration is too low, just add a little more bleach and retest.

How to make a 1500 ppm solution for general disinfection

	Amount of Cool Water	Amount of Clorox™ Disinfecting Bleach	Contact Time
Ratio	48 parts	1 part	
Five Gallon Bucket	1 gallon	1/3 cup	6 minutes
	2 gallons	2/3 cup	6 minutes
	3 gallons	1 cup	6 minutes
40 oz. spray bottle	5 cups	5 teaspoons	6 minutes
32 oz. spray bottle	4 cups	4 teaspoons	6 minutes
24 oz. spray bottle	3 cups	3 teaspoons	6 minutes
16 oz. spray bottle	2 cups	2 teaspoons	6 minutes

How to make a 2000 ppm solution to kill additional organisms

	Amount of cool water	Amount of Clorox™ Disinfecting Bleach	Contact time
Ratio	36 parts	1 part	

	Amount of cool water	Amount of Clorox™ Disinfecting Bleach	Contact time
Five gallon bucket	3/4 gallon	1/3 cup	5 minutes
	1½ gallons	2/3 cup	5 minutes
40 oz. spray bottle	4½ cups	2 tablespoons	5 minutes
24 or 32 oz. spray bottle	3 cups	4 teaspoons	5 minutes
16 oz. spray bottle	1½ cups	2 teaspoons	5 minutes