



AFTER THE FLOOD



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AFTER THE FLOOD

After a flood, the physical devastation to personal property and the community is obvious. These tragic consequences can be compounded by injuries or illness if certain precautions are not taken to protect your personal health and safety. In addition to your physical health, you need to take time to consider your mental health as well. Remember, some sleeplessness, anxiety, anger, hyperactivity, mild depression or lethargy is normal. If these symptoms are acute or if they persist, however, seek some counseling.

This information is provided by the Northeast Colorado Health Department (NCHD) to help flood victims protect themselves against diseases and other hazards in the days and weeks following a flood.

PERSONAL PRECAUTIONS

Hygiene



Following a flood, it can be difficult to maintain good hygiene and cleanliness. Doing so is imperative, however, if the risk of infectious disease is to be minimized.

Keeping your hands clean helps you avoid getting sick. Hands can be cleaned by either hand washing with soap and water or use of an alcohol-based hand rub (waterless hand sanitizer containing 60%-95% ethyl alcohol [ethanol] or isopropyl alcohol [isopropanol]). When hands are visibly soiled or dirty, it is best to wash your hands with soap and clean running water for 20 seconds. However, if clean running water is not available, you can use bottled, boiled or chemically disinfected water for washing hands (and brushing teeth). An alcohol-based hand rub can be used when hands are not visibly soiled or dirty, or when soap and water are not available.

When washing hands with soap and water:

- Wet hands with clean running water and apply soap. Use warm water if it is available.
- Rub hands together to make a lather and vigorously scrub all surfaces of hands.
- Continue rubbing hands for 20 seconds. (Helpful hint: singing "Happy Birthday" twice through will take approximately 20 seconds.)
- Rinse hands well under clean running water and dry using a paper towel, air dryer, or clean cloth towel. If available, use a paper towel to turn off the faucet.

When using alcohol-based hand rub:

- Apply product to palm of one hand using the manufacturer's recommendations regarding volume of product to use.
- Cover all surfaces of hands and fingers.
- Rub all surfaces of hands and fingers until dry.
- NOTE: If manufacturer's recommendations don't specify volume, use the following approximate amounts:
 - Liquid gel: dime-sized amount
 - Foam: egg-sized amount

Example of when you should wash your hands include:

- Before preparing or eating food
- After going to the bathroom
- After changing diapers or cleaning up a child who has gone to the bathroom
- Before and after tending someone who is sick
- After blowing your nose, coughing, or sneezing
- After handling an animal or animal waste
- After handling garbage
- Before and after treating a cut or wound
- After handling items contaminated by flood water or sewage
- After removing protective clothing, including gloves

It is important to keep wash cloths, towels, linen, and clothing clean. Bacteria can remain on these items, so wash them with clean hot water and laundry detergent. Parents need to take special care that their children follow these precautions. Do not allow children to play in floodwater or in areas that have been flooded. Wash their hands frequently, especially before meals. Contaminated toys should be cleaned and disinfected (see Cleanup section).

Protective Clothing

When entering an area that is or has been flooded, it is important to wear protective clothing, such as boots, rubber gloves and long sleeved shirts, to help reduce contact with contaminated items. Take care not to step on nails or other protruding items.

Illness/Injury

Floodwater may contain fecal material from overflowing sewage systems, and agricultural and industrial byproducts. While skin contact with floodwater does not, by itself, pose a serious health risk, ingesting anything contaminated with floodwater can cause disease.

Although disease outbreaks are rare after flooding, floodwater can contain various bacteria, viruses and other infectious organisms that may cause disease. If you are in a flood area and become ill, report your condition to your physician or local health department. The symptoms of most waterborne illnesses are similar — nausea, vomiting, diarrhea, abdominal cramps, muscle aches and fevers. Individuals may need to seek medical attention if these symptoms are severe or persist.

If you have any kind of cut, burn or infection on your hands, be sure to use plastic or rubber gloves if you must be in contact with floodwater. If open sores become exposed to contaminated water, immediately cleanse the area(s) with soap and clean water to prevent infection. If a wound develops redness, swelling or drainage, immediately seek medical attention.

One of the most serious problems that can arise from skin contact with floodwater is tetanus. The tetanus bacteria typically enters the body through places where the skin is broken, so it is very important to protect these areas. Anyone sustaining a puncture wound or who has a wound that becomes contaminated with feces, soil or saliva should have a doctor determine whether a tetanus booster is necessary. Specific recommendations for vaccinations should be made on a case-by-case basis.



DRINKING AND COOKING WATER

Public and private water supplies may be contaminated in a flood. After a flood, consider all water unsafe. Listen for public announcements on the safety of your area's water supply and follow the instructions of local authorities.

If your well has been impacted by flood waters, you should test it for bacterial contamination. Contact your closest NCHD office (information listed at the end of this document) for questions and a sample bottle.

The safest approach is to drink and cook with bottled water or water previously stored in the refrigerator. If you have to use tap water, boil it vigorously for at least five minutes. If you cannot boil it, refer to the table below for appropriate bleach to water ratio. Mix thoroughly and allow to stand for 30 minutes. This method should be used only with water that is clean in appearance and free of odor. Boiled and chlorinated water should be stored in a clean, covered container.

Household Bleach (5% Required)

<u>Gallons of Water</u>	<u>Clear Water</u>	<u>Cloudy Water</u>
1	8 drops	1 tsp.
2	1 tsp.	2 tsp.
5	2 tsp.	1 tblsp.
100	1 oz.	1 ½ oz.
1,000	1 cup	1 pint

Do not use contaminated water to make ice, brush your teeth or wash dishes. If there is a shortage of safe drinking water, use clean disposable eating utensils, plates and napkins.

HOW TO DISINFECT A WELL

In the event the water sample comes back positive for total coliform or fecal coliform bacteria follow the instructions below:

1. Add 1 gallon of household chlorine bleach (regular bleach, etc. Do not use artificially scented or unscented bleach.) If possible, mix 10 gallons of water plus the 1 gallon of bleach and introduce the mixture into the small pipe (where the wires go) inside the larger outer well casing.
2. Recirculate the water in the well by running a hose from the nearest water tap back to the well until chlorine odor is detected in the recirculating water. Run each cold water tap inside the house until chlorine odor is detected. Do not run through the hot water tank. Shut off all faucets. Allow the chlorine solution to remain in the system 8 hours. Pump water to waste after

detention time until odor and taste of chlorine has disappeared. Do not flush into the septic system or on vegetation. After 7 days, water may be resampled for bacterial examination using only sterile bottles provided by NCHD.

FOOD SAFETY

Do not eat any food that has come in contact with floodwater. If the safety of any food or beverage is questionable, follow this simple rule:

When in doubt, throw it out.

Canned Goods

Carefully examine all canned and bottled goods that have been submerged or came in contact with floodwater. Some cans or bottles may be safe to use after a good cleaning. Follow these guidelines:

- After being under water, containers with cork-lined lids or caps, screw tops or pop tops are nearly impossible to clean thoroughly around the opening. Any major temperature changes can actually cause contaminants to be sucked into such containers. They should be discarded. Also, discard any cardboard juice/milk/baby formula boxes and home canned foods if they have come in contact with flood water, because they cannot be effectively cleaned and sanitized.
- Inspect canned foods and discard any food in damaged cans. Can damage is shown by swelling, leakage, punctures, holes, fractures, extensive deep rusting, or crushing/denting severe enough to prevent normal stacking or opening with a manual, wheel-type can opener.
- Undamaged, commercially prepared foods in all-metal cans and “retort pouches” (like flexible, shelf-stable juice or seafood pouches) can be saved if you follow this procedure:
 - Remove the labels, if they are the removable kind, since they can harbor dirt and bacteria.
 - Brush or wipe away any dirt or silt.
 - Thoroughly wash the cans or retort pouches with soap and water, using hot water if it is available. Rinse the cans or retort pouches with water that is safe for drinking since dirt or residual soap will reduce the effectiveness of chlorine sanitation.
 - Sanitize cans and retort pouches by immersion in a freshly-made solution consisting of 1 tablespoon of unscented liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available) for 15 minutes.
 - Air dry cans or retort pouches for a minimum of one hour before opening or storing.
 - If the labels were removed, re-label your cans or retort pouches, including the expiration date (if available) with a marking pen.
 - Food in reconditioned cans or retort pouches should be used as soon as possible thereafter.

What to Do When the Power Goes 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 fully



stocked freezer will keep food frozen two days if the door remains closed. A half-full freezer can keep foods frozen about one day. What can you do if electric service will not be restored within one or two days?

- If your friends/family have electricity, divide your frozen foods among their freezers.
- Know where you can buy dry and block ice. Dry ice freezes everything it touches; 50 pounds of it will keep an 18 cubic food freezer below freezing for two days. When using dry ice, **never touch dry ice with bare hands** and do not stick your head into a freezer with dry ice as it gives off carbon dioxide. Add block ice to the refrigerator if the electricity is off longer than four to six hours.
- If you plan to eat refrigerated or frozen meat, poultry, fish or eggs while it is still at safe temperatures, it's important that each item is thoroughly cooked to its proper temperature to assure that any foodborne bacteria that may be present are destroyed. However, if at any point the food was above 41 degrees F for four hours or more –discard it.

Keep in mind that perishable food such as meat, poultry, seafood, milk and eggs that are not kept adequately refrigerated or frozen may cause illness if consumed, even when they are thoroughly cooked.

CLEANUP

The following cleaning guidelines may help prevent disease and reduce property loss:

- Discard contaminated objects that cannot be thoroughly washed or laundered.
- Wash contaminated surfaces and objects with warm, clean soapy water and disinfect with a bleach and water solution made of 1 cup of bleach per 1 gallon of water. Allow a contact time of 5 minutes and then rinse the surface with clean water. For food-contact surfaces (counter tops, pantry shelves, refrigerators, stoves, cutting boards, etc.) and areas where small children play, follow this process by using a solution made of 1 tablespoon (½ ounce) of laundry bleach to each gallon of water. Allow solution to air dry.
- Make sure to read and follow label instructions. Do not use ammonia. Do not mix ammonia and bleach; the vapors are hazardous.

Carpets and rugs that cannot be thoroughly dried and cleaned should be discarded and replaced. If the damaged area is small, you may be able to save the carpet by cleaning the area with a mild detergent.

Floors and hard surfaces should be cleaned with a bleach and water solution made of no more than 1 cup of bleach per 1 gallon of water, or use a household disinfectant.

Wash all linens and clothing in hot water or have them dry cleaned. Items that cannot be washed or dry cleaned, such as mattresses and upholstered furniture, should be air dried in the sun and then vacuumed and sprayed thoroughly with a disinfectant.

Paneling and wallboard must be immediately cleaned and dried thoroughly. If the damage is severe, they should be removed and replaced.

Contaminated toys should be cleaned and disinfected. Use soap (E.G. dish detergent) and clean water to scrub the toy, followed by clean water rinse to remove residual soap. After toy is scrubbed and rinsed, spray toy with an EPA-registered disinfectant or immerse toy for at least two minutes in a solution of 1 tablespoon (1/2 ounce) of laundry bleach in 1 gallon of water.

Allow toy to air dry or dry with clean cloth. Toys that are likely to be mouthed by infants or toddlers should be rinsed with clean water after they are disinfected. Note: if using bleach solution, ensure adequate ventilation and prepare fresh solution each day. Home day care settings should check with the Division of Early Care and Learning for disinfection requirements at 303-866-5188.

MOLD

Heavily damaged, porous materials (such a carpeting or drywall) that cannot be thoroughly dried and cleaned should be discarded and replaced. Non-porous surfaces and porous materials that cannot be removed should be cleaned using a soap or detergent solution. Areas that have been cleaned also may be disinfected using a diluted bleach solution (no more than 1 cup of bleach per 1 gallon of water), but it is critical that all visible mold growth and soiling are cleaned off using a soap or detergent solution before applying a disinfectant. Water-damaged materials and debris should be double bagged, sealed, and the bag wiped clean prior to removal from work areas. This will help to prevent mold spores from spreading to other, uncontaminated areas. Wear rubber gloves and protective clothing that are easily cleaned or discarded. In addition, wear a properly fitted N95 or HEPA filter facemask. These masks can be purchased at a minimal cost at a hardware store.

For more information, contact:
Colorado Department of Public Health and Environment
303-692-2700 or 1-800-886-7689, 2700 OR
Environmental Protection Agency-www.epa.gov/mold

SEWAGE DISPOSAL

Septic systems with a pump need electricity. Without it, sewage can back up into your home. Use very little water from your tap until power is restored. Do not continue to use water if sewage backs up into the house, or if water or sewage is observed surfacing near the septic system. Keep children out of wet areas affected by sewage. After floodwaters recede, usually only minimal repairs may be necessary for a private sewage system to properly function. The septic tank and lift station, if you have one, should be pumped before resuming use of the on-site wastewater treatment system. Do not be in a rush to pump the septic tank until the groundwater level has dropped. Empty tanks are more buoyant and can move, shift, or float. Inspect your inlet and outlet tees or baffles for blockages caused by debris or fats and grease from the tank. Removal of debris may damage a septic system. Vehicles can crush drain fields, tanks and distribution boxes, especially when the soil is saturated. Make sure no one drives in or around your septic tank and drain field, and either allow stumps to rot in place or have the stumps ground with a small stump grinder. In the aftermath of a flood, most communities will provide portable toilets, but these may be limited.

OTHER PRECAUTIONS

Gas Lines

When returning to your home, check immediately for leaking gas pipes. Do this by smell only. If you must have light, use battery-powered flashlights or lanterns. **DO NOT** turn lights on or off and do not use candles, oil or gas lanterns, or torches because, if gas lines are broken, an

explosion could occur. If you smell gas or suspect a leak, turn off the main gas valve at the meter, open all windows and leave the house. Notify the gas company or the police or fire department. Do not re-enter the house until you are told it is safe to do so.

Electricity

Your electrical system may also be damaged. If you see frayed wiring or sparks, or if there is an odor of something burning, but no visible fire, you should immediately shut off the electrical system at the circuit breaker.

Consult your utility company before using electrical equipment, including power generators. Be aware that it is against the law and a violation of electrical codes to connect generators to your home's electrical circuits without approved, automatic interrupt devices. If a generator is on-line when electrical service is restored, it can be a major fire hazard. In addition, improperly connecting a generator to your home's electrical circuits may endanger line workers helping to restore power.



If any of your electrical appliances are wet, first turn off the main power switch, then unplug the appliance, dry it out, reconnect it and finally turn on the main power switch. If fuses blow when the electric power is restored, turn off the main power switch again and then inspect for short circuits in your home wiring, appliances and equipment. **Caution: Do not do any of these things if you are wet or standing in water.**

Outdoors, exercise extreme caution if you find yourself around power lines. Do not touch downed power lines, particularly those in water, or objects that are in contact with downed power lines.

Carbon Monoxide

Power outages also occur during cold weather and many people use space, or room, heaters. Keep in mind that any heater that uses wood, coal, natural gas or kerosene produces carbon monoxide gas, so adequate ventilation is essential. This is especially true in small spaces, such as recreational vehicles or mobile homes. Kerosene heaters can use up the oxygen in a room or small house, so use a kerosene heater which has a sensor that detects the oxygen level. Place all space heaters at least 3 feet from any surfaces or materials that burn easily.



Mosquitoes

The large amount of pooled water that remains after a flood provides an ideal breeding ground for mosquitoes. While the majority of these mosquitoes will be merely pests, some can carry communicable diseases.

To protect yourself from mosquitoes, you should —

- Be sure door and window screens are tight-fitting and in good repair.
- Wear long-sleeved and long-legged clothing.
- Check to see that mosquito repellent contains DEET, a chemical commonly found in these products. When outdoors, apply repellent sparingly to exposed skin or clothing, as indicated on the product's label.
- Drain standing water in old tires, tin cans, bird baths, yard ornaments or other places where mosquitoes might breed.

Solid Waste

Proper disposal of garbage and refuse is necessary to minimize the development of odors, prevent such waste from becoming an attractant for insects and rodents, and prevent the soiling

of food preparation and food service areas. Improperly handled garbage creates nuisance conditions, makes housekeeping difficult, and may be a possible source of contamination of food, equipment and utensils.

NCHD does not have a program regarding Asbestos. All questions should be forwarded to CDPHE Air Pollution Control Division at 303-692-3100 or 1-800-886-7689, 3100.

Overexertion and Musculoskeletal Injuries

Recovering a flood-damaged building requires removal of soaked flooring, furnishings, wallboard and insulation. These items, when soaked with water, weigh much more than you would normally anticipate. Be aware that soaked furnishings will be harder to move and lift with your legs instead of your back. It is best to use a two-man crew to move bulky items.

OTHER HAZARDS

Swiftly Flowing Water

Do not enter swiftly flowing water, regardless of your ability to swim. You risk drowning even in swiftly moving shallow water. Do not rely on cars or other vehicles to protect you from floodwaters. People are more likely to drown inside a vehicle. Even **shallow standing water** holds hazards. Small children can drown in standing water. You should avoid wading in standing water because it may hide glass or metal fragments.

Animals

Many wild animals are forced from their natural habitats by flooding. Take care to avoid these animals because they may carry rabies. Many domestic animals also are without homes after a flood. Remember, both wild and domestic animals are disoriented when displaced. Do not corner any animal. If an animal must be removed for safety reasons, contact your local animal control authorities.

Rats may be a problem during and after a flood. Secure all food supplies and have any animal carcasses in the vicinity removed by local animal control authorities or private rendering companies.

If you are bitten by any animal, seek immediate medical attention. If bitten by a snake, first try to accurately identify the type of snake. If it is poisonous, seek medical care immediately so that the correct anti-venom may be administered.

Chemical Hazards

When returning to your area, be aware of potential chemical hazards you may encounter during flood recovery. Floodwater may have buried or moved hazardous chemical containers. These containers may harbor solvents or other industrial chemicals.

Propane tanks or drums, including those from gas grills, should not be moved. Contact your police or fire department for assistance.

Car batteries, when submerged in water, may still contain an electrical charge. They should be moved with extreme caution using insulated gloves.

For more information, please see our website at www.nchd.org under Flood Information or contact the Environmental Health Specialist listed below. Please contact by phone first to ensure availability.

Logan, Phillips, and Sedgwick Counties

700 Columbine Street

Sterling, CO 80751

Karah Merrell – 970-522-3741, 1231 or karahm@nchd.org

Kedge Stokke – 970-522-3741, 1262 or kedges@nchd.org

Morgan County

228 W. Railroad Ave.

Fort Morgan, CO 80701

Mel Bustos-970-867-4918, 2262 or melb@nchd.org

Yuma and Washington Counties

521 N. Albany St., Ste. 1120

Yuma, CO 80759

Heather Coin-970-848-3811, 3022 or heatherc@nchd.org