



A Compassionate Response to Crisis and Disaster

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Post-flooding Cleanup Information

Avoid Mold Growth After the Floodwaters Have Been Removed

An after effect of the presence of excessive moisture is the growth of mold in buildings and homes. Molds can usually be detected by a musty odor and discoloration of surfaces. Molds grow on organic materials such as paper, leather, dirt and soap scum. They grow best at warm temperatures, but they can grow over a large temperature range. If you see or smell mold, you have a problem. Some people can experience health effects when exposed to mold even if it is dead, so it must be removed.

Recommendations for Cleanup and Removal of Mold

Anyone spending more than a brief time cleaning in a moldy environment should use a **HEPA filter or N95** rated one time use disposable respirator. Also wear **Personal Protective Equipment (PPE)** such as waterproof gloves (Latex, PVC or Nitrile depending on your preference) and safety glasses. It is extremely important to open windows and doors to get fresh air. You may also consult with and hire professional contractors who specialize in indoor air quality and mold remediation.

Removal of wet items and cleaning surfaces in contact with floodwaters are important because even dead mold may cause an allergic reaction in some people. Items that readily absorb water or moisture (porous) and are not cleanable should be thrown out. Porous non cleanable items that should be thrown out include: carpeting, carpet padding, upholstery, wallpaper, drywall, floor and ceiling tiles, insulation material, some clothing, leather, paper, wood and food. Materials such as hard plastic, glass and metal can be cleaned and sanitized using household bleach.

Regular unscented 5.25% household bleach should be used. Read and follow the safety instructions on the bleach container's label. Never mix bleach with ammonia or any other cleaner. Wear PPE as described above, including eye protection. Try not to breathe bleach fumes directly from the bottle and remember to keep doors and windows open to get fresh air.

Recommendations and Safety Tips for Cleaning and Sanitizing with Bleach

The amount of bleach to mix with water depends on what you are cleaning or sanitizing. The following chart describes some items or surfaces that should and can be cleaned, the amount of bleach to mix with water, and cleaning steps for specific purposes.

Area or Item to be Cleaned	Amount of Bleach and Water to Mix		Cleaning Steps
	Bleach Amount	Water Amount	
Clean & Sanitize Food Cans and Food Contact Surfaces Food-contact surfaces (cups, plates, utensils) that may have touched floodwater. Note: Throw away wooden cutting boards, baby bottle nipples, and pacifiers	1 teaspoon	1 gallon	Wash with soap & warm water Rinse with clean water Sanitize using a mixture of 1 tsp bleach per gallon of clean water Allow to air dry
Food cans that are not bulging, open or damaged	1 cup	5 gallons	Remove can labels Wash cans with soap & clean water Dip cans in mixture of 1 cup bleach per 5 gallons of clean water
Clean & Sanitize Other Household Surfaces and Items Surfaces (floors, walls, countertops, sinks, toys, tools etc.) that do not soak up water and that may have touched floodwater	1 cup	5 gallons	Clean surfaces with soap & clean water Disinfect with a mixture of 1 cup bleach per 5 gallons of clean water Allow to air dry

Drying Out Before Rebuilding

The Problem: Wood submerged in water will absorb a large amount of water. Rebuilding too quickly after a flood can cause continuing problems such as mold growth, insect infestations, and deterioration of the wood and wall coverings. After normal cleaning, disinfect structural members that have been cleaned by applying a solution of 1 cup chlorine bleach per 1 gallon water or follow manufacturer's recommendations. The surface should be thoroughly wetted with the solution. Keep the surface wet with bleach solution for 10-15 minutes to kill the mold. Allow the solution to dry naturally 6 to 8 hours. The area must be well ventilated since bleach fumes may cause lung irritation.

How long until it's dry?

It may take weeks for the wood to be adequately dry to close a wall. The drying will vary depending on the initial moisture content and the drying conditions.

How can I tell if it's dry enough?

- **Solid Wood Framing:** The moisture content of wood framing members such as wall studs or floor and ceiling joists must be tested with a moisture meter. Wood always holds some moisture. It is considered dry enough to build or re-build if no individual piece of wood has a moisture content greater than 14% and the average moisture content of all the wood framing members is not greater than 12%. Average moisture content can be obtained by random sampling at least 10% of each component. So for example, if there are 100 wall studs, then the moisture content of at least 10 wall studs (selected at random at different spots in the house) should be tested. If any individual stud has moisture content higher than 14%, the structure should continue to be dried out. If the average moisture content of the studs collected is above 12%, the structure should continue to be dried out.
- **Gypsum Board, Plywood Floors and other building materials:** Unlike solid wood framing, the dryness of gypsum board, plywood and other building materials must be confirmed qualitatively by comparing readings between like material in affected areas of the building, as well as unaffected areas of the building. While gypsum wallboard that was saturated with floodwaters should be removed and thrown out, some areas of the house may have wallboard that did not get wet from floodwater. But there is a chance it may have picked up excessive amounts of moisture from the air or due to capillary action. Therefore the moisture content of remaining wallboard on same floor as affected area should also be tested. Materials in the affected area are presumed dry when their moisture content reading are within 5% of similar materials in unaffected areas (for example, test materials in a room on the second floor, well away from floodwaters, or in a nearby building unaffected by flooding) when taken with an intrusive/ penetrating moisture meter. A non-intrusive/penetrating meter may also be used, but keep in mind that reading from non-intrusive meters are less accurate than those from intrusive meters.

How can I dry things out?

It is important to remember that each of these procedures works best in certain situations. In areas with higher humidity, using central air systems and dehumidifiers will most likely be the most effective methods to dry out your belongings and home.

- **Ventilation:** Ventilation is usually the best way to dry things out and can remove several gallons of water per day. Provide an entrance and exhaust opening for air to promote cross ventilation. Place a fan in window or door with the fan facing to the outdoors. Seal the rest of the opening with cardboard, plywood or blankets so the fan can create a vacuum. Use fans to circulate air over wet surfaces. Face fans into corners or other hidden areas.
- **Heat:** Heat increases the moisture-holding ability of the air. Use your furnace or large heaters to heat the air. Small space heaters will have little effect. As wood gets drier it may be helpful to heat the house for a few hours, then ventilate to exchange moist air with dry air.
- **Dehumidifiers:** A dehumidifier can be used if outside air is humid. Dehumidifiers function most efficiently at warm temperatures. At 80 degrees Fahrenheit and 6% relative humidity, most residential dehumidifiers will remove 1-2 pints of water per hour from the air.



FEMA

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Debris removal guidelines

In efforts to expedite the debris removal process, please follow these rules

Placing debris **near or on trees, poles or other structures** makes removal difficult. This includes fire hydrants and meters.

Debris separation

Please separate debris into the **six categories**, shown below.

Electronics

Television, computer, stereo, phone, DVD player

Large Appliances

Refrigerator, washer/dryer, air conditioner, stove, water heater, dishwasher

Hazardous waste

Oil, battery, pesticide, paint, cleaning supplies, compressed gas

Vegetative debris

Tree branches, leaves, logs, plants

Construction debris

Building materials, drywall, lumber, carpet, furniture, plumbing

Household garbage

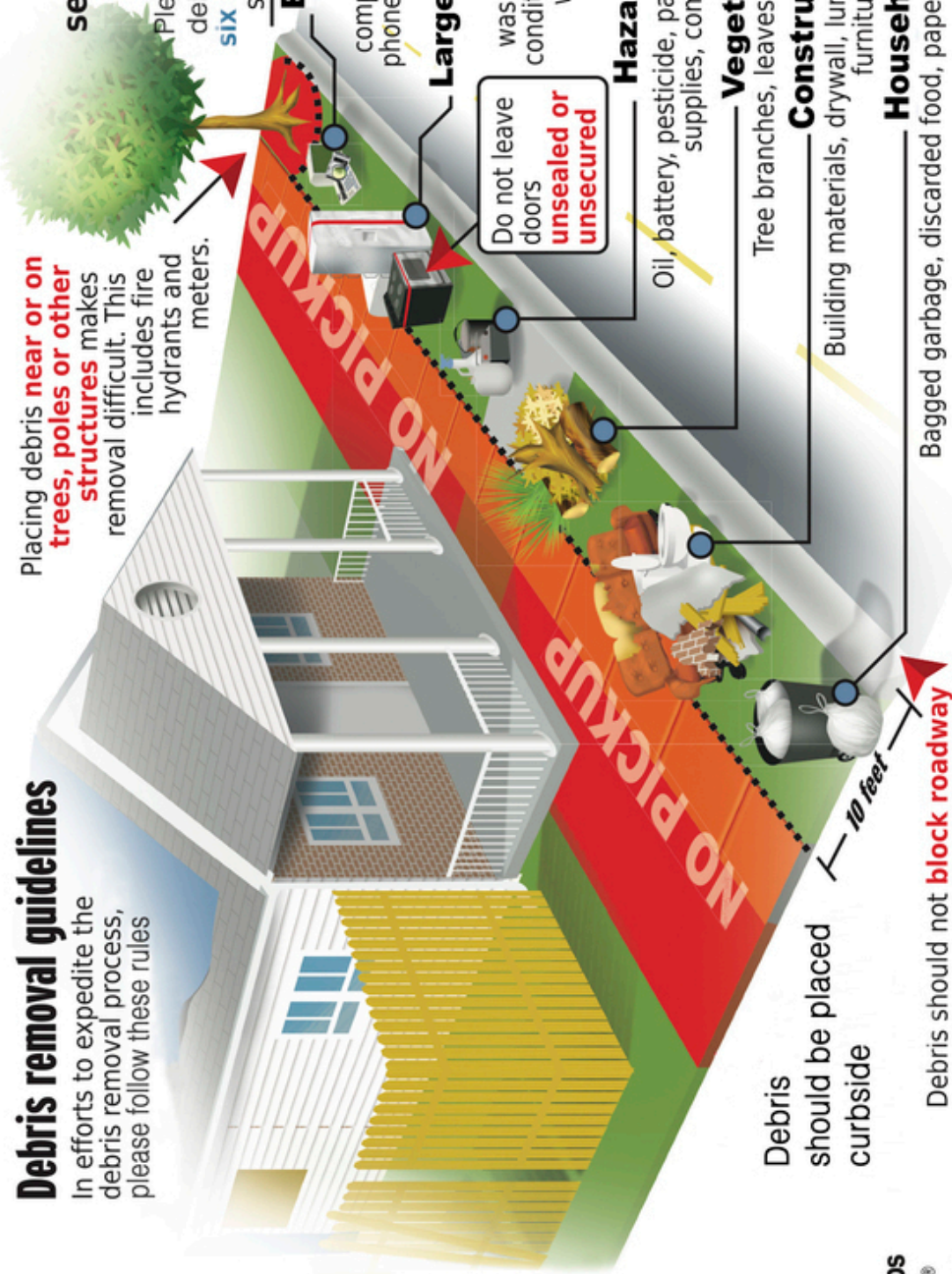
Bagged garbage, discarded food, paper, packaging.

Do not leave doors **unsealed or unsecured**

Debris should be placed curbside

Debris should not **block roadway**

10 feet



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Recommendations for Debris Removal Following a Flood

Priority:

1. Even if power has not been restored to your area, turn your power off at the main breaker.
2. Turn your gas off at the meter.
3. Remove all personal contents from each room that has been affected.
 - a. Much of the furniture made out of hardwood can be saved if dried out thoroughly and cleaned as soon as possible after the water has receded.
 - b. It is important to protect your home from further damage. Resist the urge to begin cleaning and disinfecting your personal items until you have removed *all* damaged materials from your home and placed them in a well-ventilated area, preferably with exposure to sunlight. This will ensure the maximum level of recovery for damaged items.

Materials to remove:

- All the sheetrock that has been exposed to water. We also recommend, due to the nature of how much the material will soak up moisture, removing the sheetrock 12 inches above the water line.
- All the insulation behind the wall coverings. Again, we recommend removal at least 12 inches above the water line.
- Carpet, pad and any laminate flooring.
- Most vinyl floor coverings should be removed. On occasion, we have found that some industrial floor tiles that have been glued on concrete surfaces weather flooding well, but for the most part, vinyl floorings should be removed.
- Hollow core doors.
- Paneling
 - It is often best to take the whole sheet of paneling off. You may find, depending on the quality of the paneling used, that you may be able to save some of it when it is quickly moved to a well-ventilated area outside with exposure to sunlight.
 - There may be sheetrock behind the paneling also in need of removal.
- Cabinets
 - If your cabinets are made out of plywood, there is a good chance that you can save some or all of your cabinets.
 - In order to get to all of the material that must be removed, you will have to remove your cabinets from the wall.
- Any wall tiles that have been installed onto sheetrock.

- If your ceramic tiles have been installed on a cement backer board, you may be able to leave them as long as there is clearly no damage. It is important to remove any insulation that may be located behind an undamaged ceramic tile wall. The wet insulation may necessitate the full or partial removal of the tiles.

Materials worthy of saving:

- In our experience, we have found that most hardwood and ceramic floors that have been properly installed can be saved.
- Cabinets that have been built out of plywood or solid wood.
- Wood trim, baseboards and crown molding.
- Walls that are plastered are often very hardy and can be saved.
 - It will take more time for them to dry.
 - After drying, if the plaster hasn't separated from the wood laths, you will be able to repaint.
 - Be sure to check that plastered walls have a way to drain any water collected inside.
 - If there is batten insulation, you may need to remove enough plaster to allow the removal of the insulation.

Once all the water-affected items have been removed, the critical task is to dry your home out:

- Open the windows and doors if the humidity level outside is lower than inside.
- Fans are very helpful to circulate air.
- Open all closets and cabinet doors so the air can circulate to those areas.
- You may want to use desiccants where getting air to circulate is too difficult; i.e. closets. An example of a desiccant is cat litter, which is made of clay and provides favorable absorption qualities.
- Dehumidifiers work very well.
- Work to restore power to the air-conditioning units, which will help greatly to dry out your home.

Suggestions for the use of bleach:

- Diluted bleach can be very helpful in the cleaning of your flooded belongings – but remember that it is a very toxic product and caution must be exercised.
- While treating for potential mold spores, we recommend that you consider a product like Mold Blaster. This can be purchased at your local hardware store.
- Avoid reintroducing water into your home when cleaning areas to prevent the development or spread of mold – especially in areas that are constructed with wood stud walls.