



HAWAII STATE  
DEPARTMENT  
OF HEALTH

THE STATE OF HAWAII DEPARTMENT OF HEALTH OFFERS THE FOLLOWING INFORMATION  
FOR FLOODING OF HOMES/BUILDINGS

### **HOME OR BUILDING FLOODED?**

#### **TAKE THESE PRECAUTIONS BEFORE GETTING BACK INTO YOUR HOME OR BUSINESS.**

A building that has been damaged by rising water or sewage overflows can be a dangerous place. This will help you know what to look out for and how to protect yourself and your family. It will also tell you what you need to know about cleaning up and making your home safe to live in again.

#### **Watch out for these dangers:**

Never assume that a water-damaged house is safe. Going into a building that has been flooded, even after the water is gone, can present a wide variety of hazards that can cause injury, illness or even death. **Do not allow children in the home** after the flood or while it is being cleaned, inspected or repaired.

**Electrical hazards - Do not enter** a flooded or wet building if the power is on. If any electrical circuits have gotten wet, get the power turned off at the main breaker or fuse box and leave it off until the electrical wiring or equipment has been inspected and repaired by a licensed electrician and approved by your local building inspector. (Call the Honolulu City and County Department of Planning and Permitting at 768-8172. If power lines are down, or exterior connections servicing the building or home are damaged, call Hawaiian Electric Company-HECO at 548-7311)

**Structural damage - Do not enter** a building if the framing or foundation is damaged. Look carefully before you enter. Leave immediately if shifting or unusual noises signal a possible collapse of the building. Contact your local building inspector for a safety inspection.

**Hazardous materials** - Dangerous materials that might be found in flooded homes include pesticides, fuel oil, gasoline, chemicals and other substances that might have been brought in or spilled by the flood. Damaged buildings may also contain asbestos and lead-based paint, which can cause health problems during cleanup. Practically any building material that is not obviously solid wood, metal, or glass could contain asbestos. Lead-based paint can be found pre-1978 housing and is still used in commercial and industrial buildings.

**Injuries** -Falling objects, broken or damaged building components and slick surfaces can cause injuries, broken bones, and cuts. Lifting heavy objects can cause back and muscle strains.

**Biological hazards** - Bacteria, viruses, molds and mildew can cause illness when you breathe them in or take them into your body through your mouth or through a cut in the skin. Bacteria or viruses may be left indoors by floodwater, while mold and mildew may grow indoors after the floodwater has receded.

**Bacteria and Viruses** - If you accidentally get sewage, floodwater, or the dirt it leaves behind into your mouth, you might develop gastrointestinal (digestive tract) illness.

**Mold and Mildew (Fungi)** - Many building materials, furniture, carpet and other items that stay wet for more than 24 hours will grow mold. Mold colonies are the fuzzy or patchy white, green, brown or black growths that you will see on wallboard, wood furniture and cabinets, clothing, wall studs, and almost any other surface. Mold releases tiny particles into the air that can cause allergic illness like hay fever (coughing, sneezing, eye irritation), asthma symptoms, or other respiratory illness that can be serious. Some molds may also produce toxins that could cause other illnesses. We are exposed to mold every day, indoors and out, but mold contamination can be quite severe in a water-damaged building. The risk is greatest for people with allergies or asthma, and for the very old or very young.

## Stay safe while you work:

**Wear a hard hat and safety goggles** when there is a danger of falling materials.

**Wear the right gloves** to protect your hands from cuts or exposure to hazardous chemicals.

**Wear rubber boots or hard-soled boots**, preferably with steel toes, when working and lifting.

**Wear a face mask.** If you enter a flooded building, wear a dust mask or respirator to reduce your exposure to mold. At your hardware or home supply store, look for a mask with "NIOSH" approval and an N-95 rating. Both of these marks should be on the respirator and the container. Read and follow the instructions on the mask package. Remember that the masks are disposable and should be thrown away at the end of the day.

**Stay alert.** Accidents happen when people are tired. Take the breaks you need, and drink plenty of fluids (bottled water, juice, soft drinks) to avoid dehydration. Never drink alcohol when you are working in a flooded building.

**Protect yourself from bacteria and viruses.** To keep from getting sick, wear rubber gloves while working; do not eat, drink, or smoke in the house; and wash your hands frequently with soap.

**Wet down mold.** Before you touch, move, or clean moldy or mildewed materials, wet the mold with a soapy solution from a spray bottle to prevent the mold from getting into the air. Do this even if the material is already wet because the mold probably won't be wet. Remember that mold can still make you sick even after you have sprayed disinfectants ("mold/mildew killer") to kill it.

**Be careful lifting.** To avoid back injury when lifting or handling heavy loads like furniture or carpet, avoid lifting loads of more than 50 pounds per person.

**Get help.** Before you disturb or remove materials that may be hazardous, take precautions to prevent exposure. If there is a noticeable chemical odor and/or a spilled container of a hazardous material in the building, call the fire department for help. If there is asbestos or lead paint in the building, call the Department of Health's Noise Radiation and Indoor Air Quality Branch at 586-4700.

**Be prepared.** If you get a cut or a puncture wound that is exposed to sewage, floodwater, or the dirt it leaves behind, see a doctor. Make sure your tetanus immunization is up-to-date before you work on the house. Once immunized, adults should have a routine "booster" every ten years...

## Take these steps

If a flooded building is to be safely reoccupied, it must be completely dry. Dirt and trash left by the flood must be removed from building materials and furnishings. Moldy or mildewed items must be completely cleaned and disinfected or must be thrown away. Otherwise mold and mildew will return and possibly cause health problems for you and your family later on.

### Before going back to live in your home, take the following steps:

**Get the mess out.** Remove all floodwater, dirt, and debris left behind by the floodwater.

**Remove mold and mildew.** Moldy or mildewed building materials should be thoroughly cleaned and dried or removed and replaced. Any materials or furnishings that soaked up water should be removed from the building.

**Check out the floors.** Carpet and padding cannot be cleaned well enough to prevent mold and mildew from growing. Throw them away. Take out the flooring and sub-flooring if they cannot be completely cleaned and dried or if they have started to deteriorate. The remaining floor and/or sub-floor must be dried out completely and disinfected. Make sure no moisture is trapped in or on the sub-floor. Sub-flooring made of particleboard or plywood should be removed and replaced because it can't be completely dried and disinfected. Crawl spaces should also be cleaned out and dried.

**Dry out walls.** Walls that were wet should be stripped to the studs and the insulation removed. Walls must remain open to allow them to completely dry. Other wall cavities should be inspected for visible mold growth. Any area inside a wall cavity with visible mold growth should be opened, cleaned, decontaminated and dried. The exterior of each building (siding, etc.) will need to be evaluated to see if any or all of the exterior materials should be removed. Plaster, brick and concrete block walls can probably be cleaned, disinfected and completely dried.

**Check heating and AC systems.** If the heating and air-conditioning system or air ducts were flooded, use special care. The inside parts of heating and air-conditioning systems that contacted floodwater are hiding places for mold. If mold grows in the system, mold particles may get into the air and make people sick. The interior components (furnace, air-conditioner cooling coils, and fans) will need to be inspected, cleaned and decontaminated by professionals. Air registers (vents) and diffusers should be removed, cleaned, disinfected and reinstalled. Replace lined air ducts and duckboard that got wet. Unlined ductwork can be taken apart, washed, disinfected, dried, and put back together. Air duct cleaning services are not very effective in cleaning flooded air ducts and are only useful on bare sheet-metal ducts.

**Salvage what you can.** Personal property and furnishings that are moist or wet 24 hours after floodwater recedes will have mold growing in or on them. Clothing and linens may be salvaged by washing with chlorine bleach and detergent, or sent to commercial laundries or dry cleaners. Upholstered furniture, mattresses, and furniture made of particleboard or wafer board should be thrown away. Get information on saving valuable papers, books, and photographs from the American Red Cross.

**Remove contaminants.** Make sure that any chemical contamination and hazardous materials have been removed from the building. For proper disposal, contact your local waste disposal service.

**Make sure that all parts of the building are dry** before rebuilding or repairing. Mold will grow on replacement materials if the studs, subfloor or other building parts are not completely dry. The structure should be tested with a moisture meter before you start replacing the damaged parts of your home.

## **Clean and dry the right way**

Nonporous materials (materials that don't soak up water) and furnishings and other surfaces should be thoroughly cleaned, disinfected and allowed to dry completely. First, scrub all surfaces with soap and water and rinse well. (Scrubbing removes mold, mold spores, and the dirt that mold and mildew can grow on.) Then, disinfect everything. Liquid chlorine bleach should be used to disinfect and kill any remaining mold and mildew. Follow the instructions on the label and let the bleach solution remain on the surface for at least 15 minutes before rinsing and drying. After cleaning and disinfecting, you must completely dry each item or mold and mildew will return. To speed drying, keep fresh air circulating.

The most important thing you can do to protect yourself is to use common sense and be aware of safety and health risks. Do not enter a building that is clearly unsafe. If you have questions or need assistance, contact your local health department or building inspections office.

STATE OF HAWAII – DEPARTMENT OF HEALTH  
ENVIRONMENTAL HEALTH ADMINISTRATION

Sanitation Branch – Oahu  
591 Ala Moana Blvd.  
Honolulu, HI 96813  
Ph: 586-8000 Fax: 586-8040

Noise, Radiation, and Indoor Air Quality Branch  
591 Ala Moana Blvd  
Honolulu, HI 96813  
Ph: 586-4700

Hawaii District Health Office  
1582 Kamehameha Avenue  
Hilo, HI 96720  
Ph: 933-0917 FAX: 933-0400

Hawaii District Health Office - KONA  
81-980 Helekii St., Suite 103  
Kealahou, HI 96750  
Ph: 322-1507 FAX: 322-1511

Maui District Health Office  
54 High Street, Room 300  
Wailuku, HI 96793  
Ph: 984-8230 FAX: 984-8237

Kauai District Health Office  
3040 Umi Street  
Lihue, HI 96766  
Ph: 241-3323 FAX: 241-3566

