

**Environmental Health
Emergency Preparedness and Recovery
Guidance Manual
For North Carolina**

2015

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Introduction – Before Disaster Strikes

Preparation for a disaster should always be undertaken before a disaster strikes. To that end all environmental health staff should be familiar with the Incident Command Systems (ICS) structure. The link to online training can be found here: <http://training.fema.gov/IS/NIMS.aspx> . All staff should endeavor to take ICS 100, 200, 700, and 800. Additional trainings are helpful and you should look for opportunities to participate in trainings or tabletop exercises with other state and county agencies.

Staff should be familiar with the roles and responsibilities they may have in an emergency. Each agency should have a disaster response policy in place. New employees should familiarize themselves with this plan as soon as possible. It is important to be familiar with the activities you may be called upon to perform. In the event of an emergency your normal job activities may be suspended.

Disaster Kit

Prior to an emergency, each employee should pack a disaster kit. These items should be kept readily accessible so that in the event a disaster occurs or you are deployed to an area which has experienced a disaster you are ready to respond. Suggested kit items include (but are not limited to):

Car Safety – Items to have in your trunk.

- One warm blanket or sleeping bag
- Cellular phone or an emergency phone
 - An auxiliary battery or power
- Boots or extra "rugged" shoes; water resistant boots in flood prone areas
- Socks
- Extra warm clothing such as, pull-overs, sweatshirts, sweatpants, gloves, and raincoat
- Snacks such as, crackers with cheese or peanut butter, granola
- Bottled water, canned or bottles drinks
- First aid kit
- Insect repellent
- Pepper spray (to be used for protection particularly from dogs)
- Flares
- Non-clumping kitty litter for traction
- Small shovel
- Flashlight with new batteries
- Heavy gauge jumper cables

In addition, let others know when you should arrive. Even if you are going home--let family or neighbors know ahead of time any plans you have or any changes in plans; if you are not home within an expected time period, then at least you will be missed that day/night.

If bad weather is expected, tell someone the route you will be taking. Emergency services will be able to assist you faster if they know the area you traveled. Make sure the location service is enabled on your cell phone.

Emergency Supplies for Environmental Health Staff

- Prior to event, evaluate staff vaccination status and seek guidance from medical provider
- Identification – both county and state
- Personal Protective Equipment
 - Gloves – single use food grade plastic gloves and leather work gloves
 - Safety glasses
 - Particulate dust masks
 - Hard hats (if necessary based on response plan)
- Cell phone with charged batteries or inverter (which will allow cell phones to be charged from car battery)
- Battery powered radios
- Emergency contact list including home and cell phone numbers and a current phonebook
- Emergency contact plan and location
- Digital or disposable camera
- Plastic bags, assorted sizes as well as biohazard bags
- Bottled water
- Shelf stable food and snacks
- Clipboard, notebooks, pens and pencils
- Large flashlight with extra batteries
- Duct tape
- Notices that may need to be posted (Do not drink water, boil water, etc.)
 - Other educational materials
- First aid kit
- Insect repellent

- Soap and paper towels, pre-moistened detergent towelettes
- Cash

It is important to remember to make arrangements for 4-wheel drive vehicles, if available and to fill vehicles with fuel.

Additional Equipment for Food and Lodging Staff:

- Thermometer / thermocouple
- Alcohol prep pads
- Flashlight
- Food grade plastic gloves
- Alcohol based instant hand sanitizer
- Sanitizer test strips
- Forms or other pertinent paperwork
- Spare batteries for equipment as needed

Additional Equipment for On-Site Water Protection Staff:

- Boots – appropriate for conditions
- Outdoor clothing
- Snake gators / snake bite kit
- Mosquito repellent
- Educational materials discussing septic tank maintenance

Education of Partners

Education of partners is best undertaken well in advance of a disaster. Restaurants, homeowners, daycare operators, and other business owners will be better able to respond and take appropriate actions if procedures have been addressed ahead of the disaster. Education should be started early and repeated often. Since hurricanes are an annual phenomenon in North Carolina, hurricane preparedness reminders should be sent to partners at the start of the hurricane season. Suggested materials are located in Appendix A.

During the Disaster

Please refer to specific local protocols regarding exact duties. The following documents are intended as guides to help with the most pressing duties immediately in the aftermath of a disaster.

Food Establishments

Permitted food establishments can take certain precautions to minimize product loss and maximize food safety as a result of events such as power loss and flooding. Consider the following to help ensure compliance with NC Food Code requirements.

The FOUR Basics that must be in place before opening:

| | | | |
|-----------------|------------|------------------------------|------------------|
| Physical Safety | Safe Water | Approved Wastewater Disposal | Safe Food Supply |
|-----------------|------------|------------------------------|------------------|

**1-Physical Safety

Electricity:

If a food establishment has been effected by flood waters and still has electrical power, an electrical safety hazard may exist. Contact the local Planning & Inspections Department before entering any establishment. The level of danger from electrocution varies depending on the amount of flood water that entered the establishment. There may be little or no risk if water did not get deep enough to contact any electrical connections or outlets. There may be concerns associated with hidden junction boxes and any existing wiring that does not meet code which may have gotten wet.

If there is a potentially dangerous situation, power should be disconnected to the establishment and a temporary power pole should be installed to provide a safe source of electrical power so the establishment can conduct cleanup activities that require electricity.

Generators:

No generator should EVER be connected directly to the panel box without the approval of the local Building Code Official. A generator should be installed before a storm, by a licensed electrician who will install the proper transfer switch. Since this is a commercial business, to ensure public safety, ALL work must be done under a permit issued by the local code enforcement office.

Portable generators can be used for equipment that can be directly plugged to them. Equipment that has been flooded or otherwise damaged should not be used. **Generators should never be operated inside a building due to the risk of carbon monoxide.**

**2-Safe Water

Public Connections:

Public water supplies will issue notices and advisories regarding the safety of the water supply.

If a **NOTICE** is issued, the food establishment permit will be suspended until the water supply is safe. Foodservice staff should empty, clean, sanitize or discard anything that may have come in contact with or may have been made with contaminated water. This includes ice machines, soda fountains, coffee

makers, etc. If the establishment has a fully operational high temperature dish machine, it may be used to wash contaminated items. Chemical sanitizers are generally effective under normal operating conditions; however, they may not be effective in water contamination situations. When the water supply is considered to be safe, normal operations can resume.

If an **ADVISORY** is issued, the food establishment can remain open for operations with certain precautions in place. The establishment can use bagged ice from an approved ice manufacturing facility, bottled water and drinks, and serve food that has been cooked or made with bottled or boiled water. Follow cleanup guidelines as mentioned above.

Individual Establishment Wells:

If a well has been flooded or otherwise damaged, have it tested prior to use. Flood waters contain many contaminants that can affect water safety.

Lack of Water:

If an establishment has no water they cannot be open and the permit should be suspended until water service can be restored.

Lack of Hot Water:

If an establishment has no hot water due to storm damage or failure of water heater it is not necessary to automatically suspend the permit. The establishment should be evaluated to determine if proper protocols and procedures are in place in the establishment to allow operation until hot water can be restored.

****3-Approved Wastewater Disposal**

Municipal or Public Connections:

If there is nowhere for sewage to go, the establishments' permit will be suspended. Sewage collection can be affected by many factors during a disaster. Water conservation efforts must be put in place to help minimize sewage spills or backup into an establishment.

On Site Wastewater:

Systems that have been saturated with flood waters need time to dry in order to function properly. Many wastewater systems rely on electricity to operate. These systems should not be used until they are working properly. Pouring just a few gallons of water down the drain can cause a backup of sewage into an establishment. Sewage backup into an establishment requires immediate permit suspension.

****4-Food Safety**

Contamination and Adulteration:

Food that has been contaminated or adulterated in a food establishment is considered unsafe to eat and must be discarded. Any food that cannot be verified as safe must be discarded. When in doubt, throw it out.

Physical Contaminants:

Physical contamination of food can come from many sources, including flood waters, building or equipment debris, broken containers, fire extinguishers, etc. Food that has been contaminated must be discarded. An exception to this is canned foods. Cans that show no evidence of damage can be cleaned and sanitized and used provided the food inside will be cooked thoroughly to 165F.

Biological contaminants:

Temperature is the key to controlling most biological contaminants. **If the power has been off for more than 4 hours, refrigerated foods need to be evaluated to determine what can be kept. Contact your local health department before operation. If the power has been off for less than 4 hours,** the refrigeration is operating properly, and proper food safety practices are in place, it is likely the food has not been in the danger zone for longer than 4 hours.

Frozen foods that have not exceeded 41°F can be refrozen or maintained at refrigerator temperatures. Frozen foods that have, in whole or in part, exceeded 41°F for longer than 4 hours must be discarded.

Plan to Minimize Loss in Preparation for Disaster

While a blanket set of operational guidelines CANNOT be put in place for an establishment that will guarantee an “OK” to operate during a disaster, there are some things that can be done in advance to minimize loss.

Food Protection:

Put as many perishables in the freezer as soon as possible prior to a disaster. A packed freezer will keep food below 41°F longer than a refrigerator.

Water Supply:

Buy bottled water before the storm or fill gallon jugs with water. Bottled water can also be frozen and used as space fillers in the freezer.

Ice:

Put leak-proof containers of ice in the freezer. This will provide a safe source of ice after a disaster and will help to keep a freezer cold during a power outage. Putting ice in sandwich prep units too close to a thermostat/sensor could trigger a defrost cycle or prevent the unit from cycling on and circulating air. Shut off the water supply to ice machines until the water supply can be assessed.

Wastewater:

If a power failure is anticipated and an establishment has a wastewater pump tank, it is advisable to use the manual setting on the pump control box to reduce the amount of water in the pump tank. This will free up extra storage capacity for wastewater during response time. Contact the system operator or the local health department for guidance.

The use of portable generators will prevent loss and assist with recovery efforts. They are not intended to replace approved power supplies for food establishment operation. Always use in accordance with manufacturer’s safety guidelines.

Emergency Shelters

Guidelines for sanitation and infection control in shelters.

Respiratory Hygiene

When emergency shelters are established, precautions should be taken immediately to reduce and prevent the spread of communicable disease. The following measures to contain respiratory secretions are recommended for all individuals with signs and symptoms of a respiratory infection:

- Cover mouth / nose when coughing or sneezing;
- Use tissues to contain respiratory secretions and dispose of them in the nearest waste receptacle after use;
- Perform hand hygiene (e.g. hand washing, alcohol based hand rub, or antiseptic handwash)¹

Cot and Sleeping Mat Spacing

A guideline for cot and sleeping mat spacing recommendations can be based on requirements in the Rules Governing the Sanitation of Child Care Centers. These rules require spacing of at least 18 inches or a physical barrier between cots or sleeping mats.

Food Service / Hand Hygiene

Best professional judgment will be critical in making decisions involving food handling in an emergency shelter situation. Guidance should include the following:

- All individuals with gastrointestinal symptoms such as vomiting or diarrhea must be excluded from handling food or utensils and should be restricted from the food preparation and serving areas.
- Proper hand washing should be stressed to the individuals preparing and serving food. If the water supply is questionable, a 60-70% alcohol instant hand sanitizer should be used after any visible contamination has been removed from the hands. Pre-moistened towels can be used for removal of visible contamination.
- Bare hand contact should be eliminated by the use of clean utensils, proper glove use, or menu restrictions.
- Potentially hazardous foods (not held above 135°F, or below 41°F) should be consumed or discarded within 4 hours.
- Unless dishwashing equipment is available to wash, rinse, and sanitize multi-use utensils, only single service items should be used.
- If water supplies are compromised, limit food production and service as specified in the water sections of this manual. Foods which are frozen and move directly to the oven or fryer without further preparation should be used.
- Areas used for food preparation and all serving utensils should be cleaned and sanitized with a solution of 50 ppm chlorine or equivalent after each use.
- Foods prepared in domestic, unregulated kitchens and brought to the shelter should not be served.

Shelter Assessments

¹ This is a portion of the information available from the CDC. For more information the entire document can be found at the link in the resources section at the end of this manual.

Assessments of emergency shelters should be performed periodically to ensure that adequate supplies are available and needs are being met. CDC has developed a shelter assessment tool to assist environmental health personnel in conducting rapid assessments of shelter conditions during emergencies and disasters. See Appendix A.

A list of animal friendly shelters should be developed in the event last minute evacuations become necessary.

Link to NC Shelter Assessment

Form: <http://epi.publichealth.nc.gov/phpr/docs/NCShelterEnvironAssessForm.pdf>

Link to CDC Shelter Assessment Tool: <http://www.bt.cdc.gov/shelterassessment/>

Daycare Guidelines

Daycare facilities should be closed until cleared by the building inspector or fire marshal if impacted by the event. Those needing to remain open should be evaluated on a case by case basis.

Recovery

After the disaster it is important to focus on recovery activities. Below are some guidelines on safety. These guidelines should be disseminated to partners and the public both before and after an event.

Loss of Power and Food Safety

During a complete power loss, it would not be possible for an establishment to continue operating safely, therefore it should close. Whenever power is lost, all refrigerated and frozen food should be evaluated before it is used or refrozen. The loss of power usually means loss of refrigeration and freezing capabilities. When this occurs the food must be examined to determine if it is safe for human consumption.

Remember, you cannot see or smell the bacteria that can make you sick. Food often appears normal even after it has become dangerous to eat. To insure food is safe, use an accurate thermometer to determine if any of the potentially hazardous food has risen above 41°F. After a disaster when cooling equipment hasn't been working, a standard temperature should be used, which will allow the equipment to recover before the food actually enters the danger zone. All potentially hazardous food (food requiring refrigeration) which is found above 41°F should be discarded and not served. Potentially hazardous foods, 41°F or below, should be returned to operating refrigeration equipment and

monitored to make sure the proper temperatures are maintained or cooked to proper temperatures immediately for service or hot holding.

REMEMBER – When in doubt, throw it out!

Frozen, partially-thawed food is safe to cook or refreeze if it still contains ice crystals or has not risen above 41°F. If the juices from raw meat have dripped onto cooked food discard it regardless of the temperature. It probably has been contaminated and is no longer safe to eat.

It is important to keep the refrigerator doors shut. A refrigerator will keep food cold for a few hours; a full freezer can be expected to keep food cold for 24 to 48 hours. Make sure all food is checked and evaluated immediately after power is restored. Re-cooling or re-freezing food that has been out of temperature for over two hours will not make it safe to eat, so if there is any doubt, throw it out.

The U.S. Food and Drug Administration (FDA) offers the following food safety information for expected power outages and flooding from a hurricane.

- In the event of power outages or floods from a hurricane, FDA says the most significant food safety challenge consumers will face will be keeping refrigerated foods at or below 41°F and frozen food at or below 0°F.
- Perishable food such as meat, poultry, seafood, milk and eggs that are not properly refrigerated or frozen may cause illness if consumed, even if they are thoroughly cooked.
- The FDA says that if flooding is an issue, consumers also will need to evaluate the safety of their stored food and water supply.

Use the following guidelines to keep your food safe when you experience a loss of power.

- 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) and the door remains cold. Buy dry or block ice to keep your refrigerator as cold as possible if the power is going to be out for a prolonged period of time. Fifty pounds of dry ice should hold an 18-cubic foot full freezer for two days. Dry ice produces carbon dioxide, a heavy gas that will remain in low spots without assisted ventilation. Ventilate indoor areas well to avoid hazardous carbon dioxide concentrations, and avoid skin contact with dry ice. Symptoms of exposure to carbon dioxide include hyperventilation, headaches, shortness of breath, and perspiration.

- If you will be eating your refrigerated or frozen meat, poultry, fish or eggs while they are still at safe temperatures, be sure to cook them thoroughly to the proper temperature to assure that any food-borne bacteria may be present is destroyed.
- Wash fruits and vegetables with water from a safe source before eating.
- For infants, if possible, 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.

Once the power is restored you will need to evaluate the safety of the food. If an appliance thermometer was kept in the freezer, read the temperature when the power comes back on. If the thermometer stored in the freezer reads 41°F or below, the food is safe and may be refrozen. If a thermometer has not been kept in the freezer, check each package of food to determine the safety. Remember, you can't rely on appearance or odor. If the food item still contains ice crystals or is 41°F or below then it is safe to cook or re-freeze.

Refrigerated food should be safe as long as the power is out for no more than four hours. Keep the door closed as much as possible. Discard any perishable food items (such as meat, poultry, fish eggs or leftovers) that have been above 41°F for two hours.

- Do not eat any food that may have come into contact with floodwaters. Discard any food in a non-waterproof container if there is any chance it has been in contact with floodwaters. Undamaged, commercially canned foods can be saved if you remove the labels. Thoroughly wash the cans, and then disinfect them with a solution consisting of one cup of bleach in five gallons of water. Re-label your cans, including the expiration date, with a marker. Food containers with screw-caps, snap lids, and home canned foods should be discarded if they have come in contact with floodwaters because they cannot be disinfected.
- Discard wooden cutting boards, plastic utensils, baby bottle nipples and pacifiers if they have come in contact with floodwaters as sanitation of these items cannot be ensured. Thoroughly wash metal pans, ceramic dishes and utensils with soap and hot water, and sanitize by boiling them in clean water or by immersing them for 15 minutes in a solution of one teaspoon of chlorine bleach per quart of water.

For more information on safe food handling, call FDA's toll-free information line at (888) SAFEFOOD.

Water Emergencies

When public water systems have problems, which could cause the water supply to be contaminated with bacteria, water users may be advised or notified that the water should not be used for drinking unless it is first boiled or disinfected with chlorine. This notification can be made either by the water system operator or the Public Water Supply Section, Division of Water Resources, N.C. DENR. Users may also be notified not to use water which may have chemical contamination making it unfit for drinking. During such notifications, the Divisions' Environmental Health Services Section recommends the following guidelines for restricting water use.

Types of Water Supply Emergencies

Contamination

Occasionally water supplies are contaminated or are suspected of being contaminated with microorganisms or chemicals due to a break in a water main or other damage to the distribution system. When contamination of a public water supply is suspected, the water utility operator or the Public Water Supply Section may issue an advisory or notice concerning use of the water supply. A confirmed total coliform sample will result in a "Boil Water Advisory" issued by the N. C. Public Water Supply Section and/or the owner of the water source. A confirmed Fecal Coliform sample will result in a "Boil Water Notice."

Under an **Advisory (confirmed Total Coliform or System Pressure Loss)**, recommendations are given to permitted establishments and licensed facilities regarding water use. These recommendations may include bottled water for consumption, obtaining ice from an approved source, using single use utensils, etc. Permitting action is generally not taken under an advisory but a Notice of Intent to Suspend or Revoke Permit may be issued depending on the cause and/or severity of the source of the contamination.

Under a **Notice (confirmed Fecal Coliform)**, permit action is taken because this is an imminent hazard. Under the current definition there are four situations that may justify imminent hazard abatement: a life-threatening situation, a threat of serious physical injury, a threat of serious adverse health effects, or a serious risk of irreparable damage to the environment. Each situation must involve an element of **immediacy**. This described confirmation necessitates immediate action from the Department.

If a water supply is contaminated with chemicals, the Occupational and Environmental Epidemiology Branch of the N.C. Department of Health and Human Services, Division of Public Health will likely be consulted to assess the potential health risk. If the water system is regulated by the Public Water Supply Section, section staff will issue a “Do Not Drink the Water” notice if the health risk is deemed unacceptable.

Loss of Water

Water supplies can be lost due to problems with the water source such as chemical contamination or drought emergencies, or with the treatment and distribution systems such as floods, power outages, and damaged pipes. If your facility loses its primary water source, find out why the water is off and how long it might take to restore water pressure. Repair and maintenance of the distribution system which can be completed in a few hours may only require an alternative source of drinking water, while long-term water losses may require an alternative water supply for flushing toilets, bathing, hand washing, cooking, dishwashing, cleaning and other purposes. Obtaining a back-up water supply to avoid loss of essential services requires prior planning. The following are some of the elements necessary in a back-up water supply plan.

1. Drinking Water

Water for drinking must be immediately available during a water supply failure. Facilities/establishments are not required to store drinking water on site but should have a plan to obtain it quickly. The amount of water needed for drinking should be estimated based on two liters of water per person per day for all people. Canned or bottled soft drinks can be used for a short term, but bottled water will be needed for long-term water losses.

Amount of water for 10 people = 20L, or 5.3 gal, or 21 qt, or 34 (20oz) bottles, or 42 pints per day

The emergency plan should identify several nearby sources able to supply sufficient quantities of bottled water and how the water will be transported. Possible sources may include bottled water companies, food stores and wholesalers, and beer or soft drink distributors. Bottled water companies are a good source for drinking water because they also have trucks used to transport their product. Local supplies are limited and can be quickly depleted in a large-scale emergency.

The N.C. Department of Crime Control and Public Safety, Division of Emergency Management maintains several warehouses with stocks of bottled water to be distributed by the National Guard during

such emergencies. Requests for bottled water must be made through the county or local emergency management coordinator.

2. Flushing Toilets

Water used for flushing toilets does not need to be suitable for drinking and can be obtained from any available water source. Some possible sources are boilers, water heaters, swimming pools, fountains and ponds. Some means of moving water, such as buckets and carts will need to be available. Toilets can be flushed by dumping one to two gallons of water from a bucket into the toilet bowl. Do not place water in toilet tanks because they are connected to the potable water supply. The emergency plan should identify the source of water for flushing toilets and where to obtain containers and carts needed to move the water to the restrooms.

3. Back-up Water Supplies

A back-up water supply will be needed to maintain essential functions such as food preparation, hand washing, bathing, cleaning, dishwashing, laundry and disposal of bodily waste whenever the primary water source is disrupted for more than one day. Generally, the back-up water supply should be planned to provide 25 gallons of water per day for each person unless the plan includes alternatives to reduce the amount of water needed such as switching to single-service utensils to reduce dishwashing and outsourcing laundry operations.

Facilities regularly serving 25 or more patients and staff are regulated by the Public Water Supply Section and cannot switch to another water source without prior approval from the Public Water Supply Section. Smaller facilities connected to larger public water systems must obtain approval from the Public Water Supply Section and the water supplier before any physical connection is made to the building plumbing system.

4. On-site wells

Some facilities/establishments have on-site wells to provide back-up water in an emergency. To serve as a back-up water supply for a building connected to a public water supply, the back-up well must meet all of the requirements of the *Rules Governing Public Water Systems* (15A NCAC 18C). The back-up well and storage tank must be purged and the pump run periodically to limit scale and corrosion and prevent the pump from seizing. **Only wells that are approved community water supply wells can be physically connected to a building that has a public water supply connection.** Those wells must meet all requirements of the *Rules Governing Public Water Systems*.

5. Transported water

Facilities or establishments without a back-up well on-site will have to rely on tanker trucks to transport water from an approved water source. Use of a tanker truck to move water from one public water supply system to another requires approval of the water source, tanker and connection to the facility from the Public Water Supply Section. Permission will also be needed from the source from which the water will be obtained. A Public Water Supply Section regional engineer will need to be notified as early as possible to assist with the necessary approvals. Some considerations which should be included in the emergency plan are:

- **Where to obtain water** – You can expect some delay getting another water system to approve filling a tanker and identifying where the tanker can draw the water. Identifying another nearby water system and who to contact to provide permission and designate a filling point could help when an emergency arises. Watering points specifically designed for filling tanks are preferred over hydrants, which may allow contamination. During an emergency, a Public Water Supply Section regional engineer should be able to help identify possible water sources in your area.
- **Where to get a water tanker** – This can be the most difficult part of the process – particularly if a widespread emergency has created a demand for tankers. Food-grade tanker haulers are the best source of tankers because those haulers are used for carrying food products and have the ability to clean and sanitize a truck for delivery of water. Milk haulers may be able to provide a truck in an emergency. Potable water tanks available at most agricultural supply dealers can also be mounted on trucks to haul water. In an emergency you can request help finding a water hauler through the local director of emergency management. The supply of food-grade tanker-haulers in North Carolina is too limited for all institutions to obtain pre-need contracts. It must be understood that hauling water may not be reliable in large-scale emergencies and facilities may still need to be evacuated.
- **Where to park the tanker** – The tanker will need to be connected to the building plumbing, so will need to be close to the building where connective piping can enter the system without crossing traffic areas. Knowing where the truck might be will also help with planning how much pipe will be needed to make a connection. Do not allow trucks to drive over septic fields or tanks.
- **Isolating the building plumbing** – Before the building plumbing can be pressurized with water from the back-up water supply, it will be necessary to close the connection to the primary water supply. Some hospitals and other large buildings have more than one service connection to the water system. The emergency plan should include a diagram or written description of where the

shutoff valve(s) is located. Usually it is a corporation stopcock at the water meter and may require a special tool to close.

- **How to make the connection** – Once a tank of water is on site, there will need to be equipment including a potable water pump, pressure bladder tank, pressure switch, pipes and fittings to make a connection to the building plumbing. Pipes and plumbing will have to meet *National Sanitation Foundation International/American National Standards Instituted Standard 61 Drinking Water System Components*. Chlorine bleach will also be needed to chlorinate the equipment and water prior to opening a connection. Facilities are not required to purchase equipment before it is needed, but the emergency plan should include a shopping list of necessary parts and equipment and a list of suppliers in your area where the materials can be obtained.
- **Electricity** – Depending on the emergency, an electric generator may be needed to power the water pump. If water is introduced to a plumbing system that uses a sewage pump for wastewater disposal, the pump will also need electricity to avoid a sewage back-up in the building. Since the water pump will generally have to be located at the tank, electrical wire should be included on the shopping list.

Limits on use of transported water – **Water which has been transported to a site is not usually recommended for drinking because the extra handling increases the risk of contamination and it will need to receive extra chlorination. It may be necessary to label water fountains “Do Not Drink” and continue obtaining bottled water and bagged ice until the primary water supply is restored and cleared for drinking.**

Boil water Advisories Frequently Asked Questions:

What is a Boil Water Advisory? Whenever a water system has a significant pressure loss or a confirmed total coliform bacteria test result, as a precaution, customers are advised to boil water to insure its safety until testing can confirm it’s safe to use. While there’s been no confirmation of contamination, this advisory is a recommended precaution.

What are total coliform bacteria? Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other; potentially-harmful, bacteria may be present. Usually, coliforms are a sign that there could be a problem with the treatment or distribution of a water system (pipes). Whenever coliform bacteria are detected in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or *E. coli*, are present.

Restaurants, Care Centers, Local Confinement, Residential cares, Institutions:

Should I be using ice from my ice machine? It is recommended to use ice from an alternate source such as ice purchased from a vendor that is not in the affected area of the boil water advisory.

Can I still use my dish machine or hand wash my utensils in my three compartment sink?

Recommendations for utensil washing during a boil water advisory are:

- Switch to paper/single service utensils during the advisory period
- Dish machines may be used provided heat or chemical sanitizing is working at all times. Dish machines must be operated in accordance with the data plate.
- Hand washing utensils may be continued provided heat or chemical sanitizing is working at all times. A minimum 30 second contact time is required.
- Chemical sanitizing shall be maintained with Chlorine at 50-100ppm, Quaternary Ammonia 200-400ppm. Heat sanitizing:
 - For dish machine operations, cycles shall be in accordance with the data plate with the utensil surface reaching 160°F minimally
 - For hand dishwashing, the third compartment of the set up shall be at least 171°F for a minimum of 30 seconds immersion at all times utensils are being washed.

Is it safe to wash your hands? Hand washing must occur prior to preparing food. During an advisory, wash hands using tap water or at a hand wash station using water that has been boiled. In addition, use a hand sanitizer, and do not handle ready-to-eat food with your bare hands. Use gloves, utensils, or deli paper when handling ready-to-eat foods.

Is it okay to make beverages with the water? Bottled water or water that has been boiled for 1 minute (after water begins to boil) should be used. Self-service beverage or post mix fountain equipment should not be in service.

How should I handle fresh produce? It is recommended to use pre-washed packaged produce, frozen or canned fruits and vegetables that do not require washing. Produce which has been washed prior to the advisory and that will be cooked to a temperature of 145°F is acceptable to prepare and serve. For establishments which have produce misters, misters should not be in service during the advisory.

What should I do after the advisory is lifted? The utility company will be super chlorinating the water supply to ensure safety. Follow the advice or guidance of the water utility. The following steps should be completed once the advisory is lifted.

- Equipment with water line connections such as post mix beverage machines, spray misters, coffee or tea urns, ice machines, glass washers, dishwashers, and other equipment must be flushed, cleaned and sanitized in accordance to manufacturer's instructions
- Run water softeners through a regeneration cycle
- Drain reservoirs in tall buildings
- Flush drinking fountains; run continuously for 5 minutes
- For ice machines:
 - flush the water line

- close the valve on the water line behind the machine disconnect the water line from the machine inlet
- open the valve
- run 5 gallons of water through the valve and dispose of the water
- close valve
- reconnect water line
- Open the valve
- flush the water lines in the machine
- turn on the machine
- make ice for 1 hour and dispose of the first batch of ice
- Clean and sanitize all parts and surfaces that come in contact with water and ice, follow manufacturer's instructions

Boil Water Notice Frequently Asked Questions

What is a Boil Water Notice? A notice is when fecal coliform bacteria have been confirmed in a water supply.

What are fecal coliform bacteria? Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with compromised immune systems. The symptoms above are not caused only by organisms in contaminated drinking water. If you experience any of these symptoms that persist, you may want to seek medical advice.

Restaurants, Child Care Centers, Local Confinement, Residential care, Institutions, Schools, School Lunchrooms:

During a Boil Water Notice, establishments which are permitted by the Department such as restaurants, food stands, meat markets shall be closed. A boil water notice is an imminent hazard and permit action is required for protection of public health.

The Department will advise licensing, permitting or certification agencies of the imminent hazard for facilities such as institutions, child care, local confinement, and schools.

Institutions should activate their back up water plan for water used for consumption and food preparation and service. Institutions should be operating under their emergency operation procedures.

Schools may remain open or be closed at the discretion of the local superintendent with precautionary measures taken such as discontinued use of water fountains, alternate hand washing methods, etc. Schools should be operating under their emergency operation procedures.

Local confinement shall be operating under their emergency operations procedures. Taking precautions to turn off water supplies for consumption and outsourcing food supplies from a vendor or establishment that is not in the affected area. Prepackaged, ready to eat food may be used as back up food supplies.

What should I do after the notice is lifted? The utility will be super chlorinating the water supply to ensure safety. Follow the advice or guidance of the water utility. These will probably flushing pipes, faucets for at least 5 minutes. **The following steps should be completed once the notice is lifted.**

- Equipment with water line connections such as post mix beverage machines, spray misters, coffee or tea urns, ice machines, glass washers, dishwashers, and other equipment must be flushed, cleaned and sanitized in accordance to manufacturer's instructions
- Run water softeners through a regeneration cycle
- Drain reservoirs in tall buildings
- Flush drinking fountains; run continuously for 5 minutes
- For ice machines:
 - flush the water line
 - close the valve on the water line behind the machine disconnect the water line from the machine inlet
 - open the valve
 - run 5 gallons of water through the valve and dispose of the water
 - close valve
 - reconnect water line
 - Open the valve
 - flush the water lines in the machine
 - turn on the machine
 - make ice for 1 hour and dispose of the first batch of ice
 - Clean and sanitize all parts and surfaces that come in contact with water and ice, follow manufacturer's instructions

Appendix A Useful Documents

Guidance for Re-Entry of Damaged Buildings

Electrical Hazards

Floodwaters and wet building components near electrical wires and circuits can conduct electricity. Standing on wet ground or floors can also make you more susceptible to electrocution. To avoid electrocution when entering a flooded or damaged building, turn off the power at the main breaker or fuse on the service panel. Do not turn the power back on until a qualified electrician has inspected the electrical equipment. Do not touch electrical equipment if the ground is wet unless you know the power is off and **never** handle a downed power line.

When using a generator to supply power to a building, it is possible for electricity to backfeed from the building which energizes power lines causing a risk of electrocuting the utility line workers trying to restore permanent power. Buildings powered by a generator must be disconnected from the utility grid by turning off the main breaker or fuse at the service panel. Unless a qualified electrician has installed a transfer control device in your service panel to prevent the backfeed of electricity, power key appliances with extension cords directly from the generator and avoid energizing the building electrical system.

If downed power lines are present, contact the utility company to remove the hazard before doing any clearing work in the area. Be careful of overhead electrical lines when using ladders and other equipment. All switches and motors, which have been in contact with floodwaters, must be thoroughly cleaned, dried and inspected before reusing them. Use only wet-dry vacuums designed to vacuum water when vacuuming wet materials.

Fire and Explosion Hazards

If flooding has drowned pilot lights on gas-powered appliances or structural damage has broken gas pipes, there can be a buildup of gas in a building to levels that could cause an explosion. Before entering a damaged building, turn off the gas at the meter. Never use a cigarette lighter or other open flame to see in a dark building. Use a flashlight rather than turning on electrical switches until you have checked for gas. Open the doors and windows to allow trapped gas to escape. If you smell gas, leave the building. Fire can pose an increased risk in a disaster because water supplies and sprinkler systems may not work and firefighting equipment may already be in use or have difficulty traveling to your location. Fire extinguishers should be included in the tools used when rehabilitating damaged buildings.

Slip Hazards

Floodwaters leave a coating of mud making floors and walkways slippery.

Animals

Floodwaters will move snakes and other wild animals out of their usual habitats and they may seek refuge in storm debris. Domestic pets can become disoriented and agitated posing a threat to people. Lift debris with sticks to check for hazards or wild animals before moving it. If domestic animals need to be removed from an area contact the county animal control office or the State Animal Response Team for help.

Chemicals

Do not permit children to play in floodwaters or mud. Floodwaters entering warehouses and other areas containing chemicals can carry harmful chemicals away from storage areas. Rising water can dislodge chemical storage tanks and piping allowing hazardous materials to flow downstream. Do not attempt to move dislodged tanks, drums or containers without contacting the fire department or hazardous materials team to assess the potential danger. Skin irritation and burning of mucous membranes following exposure to water or mud can be signs of toxic chemical exposure. If these symptoms are encountered, leave the area immediately and wash the affected skin with soap and water. Working in chemically contaminated areas requires special personal protective equipment and knowledge of how to work safely with the hazards present.

Mold

Following heavy rain or flooding, mold growth can pose a health hazard. Some molds produce toxins and respiratory irritants that can have long-term health effects. Assume any materials still wet more than one day after water recedes are likely to be growing mold. Even if you do not see mold, it can grow inside the cavities in walls and produce toxins and irritants. Walls that were flooded should be stripped to the studs, cleaned, disinfected and allowed to dry thoroughly before being recovered. Clothing exposed to floodwaters needs to be disposed of or cleaned and dried as soon as possible. Heating and

air conditioning ducts and equipment exposed to floodwaters can become a continuing source of exposure unless dismantled and thoroughly cleaned and disinfected.

Mosquitoes

Mosquitoes increase in numbers after significant rain or flooding and in addition to being a nuisance, can carry a variety of dangerous diseases. To reduce mosquito breeding, drain and dry standing water as soon as possible and empty containers of pooled water. To report heavy infestations or get information about controlling mosquitoes, contact your local mosquito control program or county health department. Wearing long-sleeved clothing and using insect repellants containing DEET, picaridin or oil of lemon eucalyptus will help protect you from mosquitoes. For more information, see Section (#), “Insects,” of this manual.

Structural failure

Inspect foundations for wash outs or structural cracks caused by moving water. Buildings shifted from their foundations should not be entered. Flooded basements and crawl spaces should be emptied as soon as possible. Take care to assure pressure from saturated soil outside will not cause foundations or walls to collapse when water is removed from basements. Examine buildings for sagging roofs or other signs of structural failure before going inside.

When entering a building, wet building materials such as sheetrock made heavy by water may fall off of walls or ceilings causing injury. Look for sagging ceilings or bowed walls, and avoid walking under them. If water has risen above the ceiling or the roof has been damaged, large amounts of water and wet insulation above the ceiling can cause the ceiling to fall. To check for water above a ceiling, stand in a doorway and use a stick to poke a hole through the ceiling. If water drips from the ceiling, stay out of the building until the ceiling can be safely drained and removed.

Carbon Monoxide

Combustion appliances such as gas- or diesel-powered generators and pumps, gas or kerosene space heaters and gas or wood-burning stoves or fireplaces can produce carbon monoxide – a poisonous gas that can cause suffocation. Use combustion equipment such as generators and gas grills outdoors, placing them where their exhaust cannot enter the building. Use only heaters designed for indoor use inside the building and assure there is adequate ventilation to allow air into the building. Do not try to use gas stoves designed for cooking to heat the house. Follow the manufacturer’s instructions on the use of combustion equipment. If you plan to use combustion appliances to heat a home during a power

outage, install a battery-powered carbon monoxide detector. Symptoms of carbon monoxide poisoning can be headaches, dizziness, nausea, tiredness or flushed red skin color. If any of these symptoms occur, leave the building immediately and seek medical attention. Check the exhaust vent to make sure it is still operating prior to restarting gas fueled heating systems.

Asbestos

Asbestos was used in more than 3,000 building products and can be found in homes, public, commercial, and industrial facilities. These materials normally present no problem as long as they are in good condition and are not disturbed. However, if asbestos containing building materials are in poor condition or if they are improperly handled during a renovation or demolition activity, asbestos fibers can be released. Exposure to asbestos fibers can cause serious health problems. Breathing airborne asbestos fibers can lead to an increased risk of (1) lung cancer; (2) mesothelioma, a cancer of the lining of the chest or abdominal cavity; and (3) asbestosis, scarring of the lung tissue.

Building products that may contain asbestos include: insulation on boilers, steam pipes, water pipes and ducts; cementitious siding or roofing shingles; ceiling tile (all forms); asphalt and felt roofing applications; wallboard and mud joint compound; sprayed-on or trowelled-on surface materials on walls and ceilings: insulation (wall or ceiling), floor tiles and sheet vinyl floor coverings, etc.

******WARNING******

Because of the potential hazards associated with the handling of asbestos containing building materials, there are specific regulatory requirements that must be met prior to renovation or demolition activities occurring in Food Service Establishments, Retail Stores, Child Care Center and Lodging Establishments and Institutions.

These requirements include: having an inspection conducted by an accredited asbestos inspector prior to renovation or demolition activities taking place; using accredited asbestos workers and supervisors to properly remove any asbestos containing materials that have been damaged by floodwaters or will be damaged by the renovation/cleanup activities; applying for permit/notifications for applicable renovation or demolition activities; clearance air monitoring in applicable public areas; and proper

disposal of asbestos waste. **For more information, contact the N.C. Health Hazards Control Unit at (919) 707-5950.**

- **DON'T** dust, sweep, or vacuum debris that may contain asbestos.
- **DON'T** saw, sand, scrape, or drill holes in asbestos materials.
- **DON'T** use abrasive pads or brushes on power strippers to strip wax from asbestos flooring. Never use a power stripper on a dry floor.
- **DON'T** sand or try to level asbestos flooring or its backing.
- **DO** keep activities to a minimum in any areas, such as crawl spaces or attics, having damaged material that may contain asbestos.
- **DO** take every precaution to avoid damaging asbestos or materials that may contain asbestos.

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.

Wind damage can topple trees and structures, leaving large amounts of heavy debris to move. Pace yourself, and drink plenty of clean water, eat properly and get plenty of rest. Fatigue is a contributing factor in many injuries.

Heat Stress

Clean-up workers are susceptible to a variety of heat-related problems, including heat stroke, heat exhaustion, heat cramps and fainting. Taking frequent breaks to cool down and drink fluids will help prevent overheating. Wearing light-colored clothing helps reduce heat absorption from sunlight, and scheduling more physically demanding work during cooler hours will help. Opening windows or using fans indoors can also help reduce heat stress.

Falls

A major cause of injury following heavy wind damage is falls off of roofs, ladders or trees. It is important to cover damaged roofs with tarps to prevent water damage to the inside of your house, but if you are not accustomed to working on a roof, it is best to get some help. Even if you have to do the work yourself, having someone nearby to help steady the ladder and call for help if you fall will improve

safety. If you must clear limbs out of trees or remove trees from the roof, be aware that trees can kick back when cut and brace yourself for some movement.

Disinfecting Flooded Wells

1. First, pump your well for about 30 minutes at the wellhead or an outside faucet to remove the most contaminated water.
2. Using one of the charts below, pour the amount of chlorine, either 70 percent calcium hypochlorite (Chart A), or unscented household bleach (Chart B) into the well. The charts indicate the amount of chlorine needed based on the diameter of well casing and depth of water in the well. Calcium hypochlorite is preferred for disinfecting wells, but unscented household bleach containing sodium hypochlorite will work in an emergency. When calcium hypochlorite tablets are used, they should be carefully broken into smaller pieces using proper eye protection and rubber gloves.

Chart A: Amount of Calcium Hypochlorite (70 percent available chlorine)

| Depth of Well | 2-inch casing | 4-inch Casing | 6-inch Casing | 8-inch Casing | 10-inch Casing | 24-inch Casing | 36-inch Casing |
|---------------|------------------|------------------|-------------------|------------------|-------------------|--------------------|-------------------|
| 50 Ft. Deep | .2 oz <i>or</i> | .6 oz <i>or</i> | 1.5 oz <i>or</i> | 2.5 oz <i>or</i> | 3.9 oz <i>or</i> | 22.5 oz <i>or</i> | 50.5 oz <i>or</i> |
| | 1 tablet | 4 tablets | 10 tablets | 17 tablets | 28 tablets | 157 tablets | 353 tablets |
| 100 Ft. Deep | .3 oz <i>or</i> | 1.3 oz <i>or</i> | 3 oz <i>or</i> | 5 oz <i>or</i> | 7.8 oz <i>or</i> | 45 oz <i>or</i> | 101 oz <i>or</i> |
| | 2 tablets | 9 tablets | 21 tablets | 35 tablets | 53 tablets | 315 tablets | 707 tablets |
| 200 Ft. Deep | .65 oz <i>or</i> | 2.5 oz <i>or</i> | 6.1 oz <i>or</i> | 10 oz <i>or</i> | 15.6 oz <i>or</i> | 90 oz <i>or</i> | 202 oz <i>or</i> |
| | 5 tablets | 17 tablets | 42 tablets | 70 tablets | 108 tablets | 630 tablets | 1414 tablets |
| 400 Ft. Deep | 1.3 oz <i>or</i> | 5 oz <i>or</i> | 12.2 oz <i>or</i> | 20 oz <i>or</i> | 31 oz <i>or</i> | 179.2 oz <i>or</i> | 403 oz <i>or</i> |
| | 9 tablets | 35 tablets | 85 tablets | 140 tablets | 217 tablets | 1254 tablets | 2821 tablets |

Chart B: Amount of Unscented Household Bleach (5.25 percent available chlorine)

| Depth of Well | 2-inch casing | 4-inch Casing | 6-inch Casing | 8-inch Casing | 10-inch Casing | 24-inch Casing | 36-inch Casing |
|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|
|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|

| | | | | | | | |
|--------------|------------------|-----------------|------------------|-----------------|------------------|-------------------|-----------|
| 50 Ft. Deep | 5 ½ T. <i>or</i> | 1 cup <i>or</i> | 2 ½ c. <i>or</i> | 4 c. <i>or</i> | 6 ½ c. <i>or</i> | 37 c. <i>or</i> | — |
| | .02 gal. | .06 gal. | .15 gal. | ¼ gal. | ½ gal. | 2.33 gal. | 5 ¼ gal. |
| 100 Ft. Deep | ½ cup <i>or</i> | 2 c. <i>or</i> | 4.6 c. <i>or</i> | 8 c. <i>or</i> | 13 c. <i>or</i> | 74 ¾ c. <i>or</i> | — |
| | .03 gal. | .13 gal. | .3 gal. | .52 gal. | .8 gal. | 4.7 gal. | 10 ½ gal. |
| 200 Ft. Deep | 1 c. <i>or</i> | 4 c. <i>or</i> | 9 ½ c. <i>or</i> | 16 c. <i>or</i> | 26 c. <i>or</i> | — | — |
| | .06 gal. | ¼ gal. | .58 gal. | 1 gal. | 1.62 gal. | 9.3 gal. | 21 gal. |
| 400 Ft. Deep | 2.1 c. <i>or</i> | 8 c. <i>or</i> | 20 c. <i>or</i> | 34 c. <i>or</i> | 52 c. <i>or</i> | — | — |
| | .13 gal. | ½ gal. | 1.2 gal. | 2.1 gal. | 3 ¼ gal. | 18.6 gal. | 42 gal. |

- Using a hose, recirculate water back into the well until you smell chlorine in the water
- Rinse the well casing and all other equipment in the well with the chlorine.
- Turn on each faucet in and on the house until you smell chlorine, then turn off and let chlorine stand in the well and plumbing systems for at least 24 hours.
- After 24 hours, connect a garden hose to an outside faucet and run water through the hose away from the house foundation and any septic tank system until the chlorine smell is gone. Do not pump large quantities of highly chlorinated water into a septic system.
- After the disinfection process is completed, contact your local health department to have the water sampled. Continue to use bottled water or water that has been brought to a rolling boil for one minute until sample results show no coliform bacteria contamination.

Guidelines for Cleaning, Salvaging, and Remodeling

Note that for remodeling work it may be necessary to obtain building permits and/or review of the site for the presence of hazardous materials (asbestos and/or lead based paint). Please contact the local building authority or the Health Hazards Control Unit for guidance prior to beginning major structural demolition or repair.

Food Service Establishments and Retail Stores

Remember the golden rule of clean-up work – Wash your hands thoroughly and do it often.

Food and Beverages

All flooded food, including sealed and open packages, boxes, cans, produce and fresh meats must be discarded to avoid food-borne illness or injury. Foods that were not flooded and reached temperatures above 41°F must be discarded. Frozen foods which thawed but did not reach a temperature above 41°F may be refrozen.

Equipment

Thoroughly clean and sanitize all salvageable equipment. Use a detergent and a sanitizing solution made with one tablespoon of regular, non-scented bleach in a gallon of water. You can generally save equipment if:

- It is made of stainless steel or other nonabsorbent materials.
- It contains only non-absorbent, closed cell polyurethane insulation. (This material is used in newer refrigerators and freezers. It may require cleaning, so check with the manufacturer.)

Refrigerators, freezers and other equipment with fiberglass insulation must be evaluated to see if the insulation has been flooded. If so, the insulation must be removed and replaced. Styrofoam or closed cell polyurethane insulation may be able to be cleaned, so check with the manufacturer. A thorough inspection of the electrical components (wiring, compressors, switches, etc.) must be performed by a professional to judge whether they need replacing. Use a reliable professional for these jobs. Often the cost in materials and time spent in refurbishing flood-damaged electrical equipment exceed the cost of replacement.

Check your water heater. It should be replaced if floodwaters got into the gas burner, electrical parts, or insulation.

Take the following precautions when salvaging post-mix and beverage machines, coffee or tea urns, ice machines, glass washers, dishwashers and other equipment with water connections:

- Flush waterlines, faucet screens and waterline strainers, and purge fixtures of any standing water.
- Clean and sanitize all fixtures, sinks and equipment using detergent, rinsing, then sanitizing with a solution of one tablespoon of bleach in a gallon of water.
- Also see Section (x), "Decontamination of Ice Machines."

Discard any equipment that is either damaged and cannot be repaired to American National Standards Institute standards or includes flood-damaged wood, particle board or plastic laminate components (counters, cabinets, bars, etc.)

Walk-In Cooler Restoration Guidelines

In general, the walk-in cooler in a flooded food service facility needs to be reviewed on a case-by-case basis.

- If the inside of the cooler has a quarry tile floor with 6-inch sealed coving and the water did not flood over the coving, the interior surface can be cleaned by scrubbing with soap and water and then sanitized with a solution of one cup of bleach with four gallons of water. Do this with plenty of ventilation.
- If the inside of the cooler has walls that sit directly on the floor, and the caulking seal is intact, the cooler walls can be cleaned, scrubbed, and sanitized with one cup bleach to four gallons water. The walls of the cooler should be made of wood frame with closed foam insulation for this process to be successful.
- If the inside of the walk-in cooler was damaged by holes or cuts and the floodwaters rose above those holes or cuts, the entire panel will need to be replaced.

On a free-standing walk-in cooler, the panels can be disassembled, cleaned and sanitized to remove the silt below the panel. This would apply when the cooler wall did not have a satisfactory seal at the wall and floor juncture.

Flooded walk-in coolers with a permeable wood floor need to have the floor replaced. Walk-in coolers sitting directly on the floor with an aluminum interior floor should have the floor raised and power washed below the floor to remove the river silt. Remediation techniques will not guarantee the absence of odors that may develop in the future.

******WARNING******

Always use extreme caution when restarting equipment with electrical components.

Furnishings

Furnishings and fixtures that are porous or absorbent will need to be discarded if they have been in contact with floodwaters. Examples are:

- All upholstered furniture, including chairs, bar stools, benches, booth seats and bar arm rests;
- Any tables or booths that cannot be effectively cleaned and sanitized; and
- Books and paper products that cannot be thoroughly cleaned.

Clothes and drapes can be washed with potable water containing a sanitizing agent such as bleach or pine oil cleaners. Cloth items which say dry clean may be salvaged by dry cleaning.

Walls and Ceilings

If floodwaters soaked the sheetrock, insulation or ceiling tiles, remove these items 30 inches above the waterline. Paneling may be removed and saved, but you will still need to get air circulating in the wall cavities to dry the studs and sills. Wet studs and sills do not need to be replaced if allowed to dry properly. Flooded portions of studs and sills should be cleaned and treated with biocides such as a bleach and water solution.

For paneling, carefully pry the bottom off each panel away from the wall. Use something to hold the bottom away from the sill so the cavities can be drained, cleaned, checked for mold and dried out. You can nail them back once the panel and studs dry out. Remove and discard flooded insulation.

Undamaged walls, hard surfaced floors and other surfaces should be cleaned and disinfected with a solution of one-quarter cup of bleach to one gallon of water. Vinyl wall covering should be removed and

Remove any linoleum discarded if soaked.

Floors and Floor Coverings

or tile that been flooded, so you can clean and dry the wooden subflooring. When placed on a concrete base, only loose linoleum or tile need be removed. Linoleum or vinyl tile can be saved and reused if it can be cleaned and sanitized. Wall-to-wall carpeting, padding and foam rubber should be thrown away if they were soaked with floodwaters. Remove tile or vinyl flooring if it is warped, loose or has a foam-rubber pad.

Duct Work

Vents and duct work for air conditioning/heating units that were submerged in floodwaters need thorough cleaning and sanitizing. If it is impossible to do this, it will be necessary to replace them. Insulation around ducts or ducts made of compressed fiberglass will need to be replaced.

******WARNING******

Before disturbing building materials damaged by floodwaters, refer to the “Asbestos” paragraph in the section titled “Potential Dangers of Re-entering Damaged Buildings” for additional guidance. Materials that may contain asbestos include walls, ceilings, flooring or insulation (on ducts, pipes, mechanical equipment or attic).

Child Care Centers

Clean everything that got wet with warm, soapy water and follow with a rinse. Floodwaters have picked up chemicals from roads, farms, and storage buildings, along with animal and human wastes from lagoons, treatment plants and septic tanks. To prevent mold and mildew growth, try to do this job within 24 to 48 hours after the floodwaters recede.

Wells

If you have your own well serving your child care business and the flood covered the well, it must be chlorinated and tested prior to use. Please contact your local health department for complete instructions on chlorination. It will be important to know the diameter of the well casing and the depth of the well to complete chlorination.

Sewage Systems

If your septic tank system was flooded, please call your local health department for an evaluation of the system before using it. Flooded systems may malfunction without proper attention.

Mold

Organic material, bacteria and other microorganisms are deposited onto hard surfaces and into porous building materials and furnishings by floodwaters. Many building materials and furnishings that remain wet for more than 48 hours will develop visible fungal colonies. These colonies are commonly referred to as mold or mildew.

Molds and mildews resulting from flooding can create significant health risks for occupants.

Unintentional ingestion of floodwaters or sediment can cause gastrointestinal diseases. Inhalation exposure to molds may cause allergy symptoms. These symptoms can often be severe. Some fungi may cause infectious respiratory disease, while others generate toxins that may cause illness.

If a flooded building is to be reoccupied, water and the deposited material must be removed. All indoor fungal growth that occurred as a result of flooding must be removed. Clean surfaces first, then apply biocides such as bleach and water to kill molds. Porous materials will need to be replaced.

You can disinfect floors or wood surfaces using a solution of one-quarter cup of bleach in a gallon of water. If mold has already begun to grow, use a stronger solution, for example, a half of a cup of bleach per gallon of water. Make sure you have adequate ventilation when using strong chlorine solutions.

Food and Beverages

All flooded food, including sealed and open packages, boxes, cans, formula, produce and fresh meats must be discarded to avoid food-borne illness or injury. Potentially hazardous foods that were not flooded and reached temperatures above 41°F must be discarded. Frozen foods which thawed but did not reach a temperature above 41°F may be refrozen.

Equipment

Thoroughly clean and sanitize all salvageable equipment. Use a detergent and a sanitizing solution made with one tablespoon of regular-strength, non-scented bleach in a gallon of water. You can generally save equipment if:

- It is made of stainless steel or other nonabsorbent materials.
- It contains only non-absorbent, closed cell polyurethane insulation. (This material is used in newer refrigerators and freezers. It may require cleaning, so check with the manufacturer.)

Refrigerators, freezers, and other equipment with fiberglass insulation must be evaluated to see if the insulation has been flooded. If so, the insulation must be removed and replaced. Styrofoam or closed cell polyurethane insulation may be able to be cleaned, so check with the manufacturer. A thorough inspection of the electrical components (wiring, compressors, switches, etc.) must be performed by a professional to judge whether they need replacing. Use a reliable professional for these jobs. Often the cost in materials and time spent in refurbishing flood-damaged electrical equipment exceed the cost of replacement.

Check your water heater. It should be replaced if floodwaters got into the gas burner, electrical parts, or insulation.

Take the following precautions when salvaging ice machines, dishwashers, and other equipment with water connections:

- Flush waterlines, faucet screens and waterline strainers, and purge fixtures of any standing water.
- Clean and sanitize all fixtures, sinks, and equipment, using detergent first, followed by a solution of one tablespoon of bleach in a gallon of water.
- Also see Section (x), “Decontamination of Ice Machines.”

Discard any equipment that is either damaged and cannot be repaired to manufacturer standards, or includes flood-damaged wood, particle board or plastic laminate components (counters, cabinets, bars, etc.)

Walk-In Cooler Restoration Guidelines

In general, the walk-in cooler in a flooded facility needs to be reviewed on a case-by-case basis.

- If the inside of the cooler has a quarry tile floor with 6-inch sealed coving and the water did not flood over the coving, the interior surface can be cleaned, scrubbed and sanitized with a solution of one cup of bleach with four gallons of water. Do this with plenty of ventilation.
- If the inside of the cooler has walls that sit directly on the floor and the caulking seal is intact, the cooler walls can be cleaned, scrubbed, and sanitized with one cup bleach to four gallons water. The walls of the cooler should be made of wood frame with closed foam insulation for this process to be successful.
- If the inside of the walk-in cooler was damaged by holes or cuts, and the floodwaters rose above those holes or cuts, the entire panel will need to be replaced.

On a freestanding walk-in, the panels can be disassembled, cleaned, and sanitized to remove the silt below the panel. This would apply when the cooler wall did not have a satisfactory seal at the wall and floor juncture.

Flooded walk-in coolers with a permeable wood floor need to have the floor replaced. Walk-in coolers sitting directly on the floor with an aluminum interior floor should have the floor raised and power washed below the floor to remove the river silt. Remediation techniques will not guarantee the absence of odors that may develop in the future.

******WARNING******

Always use extreme caution when restarting equipment with electrical components.

Call your county building inspector or a licensed electrician if you need guidance.

Furnishings

Furnishings and fixtures that are porous or absorbent will need to be discarded if they have been in contact with floodwaters. Examples are:

- All upholstered furniture, including chairs, mattresses, play pens, sleeping mats, cots, stools, benches and booth seats;
- Any tables or booths that cannot be effectively cleaned and sanitized; and
- Books and paper products that cannot be thoroughly cleaned.

Clothes, bedding and drapes can be washed with detergent and potable water containing a sanitizing agent such as bleach or pine oil cleaners. Clothe items that say dry clean may be salvaged by dry cleaning.

Re-entering a flooded building

For more information on re-entering buildings after a flood, please refer to the section titled “Potential Danger on Reentering a Damaged Building.”

******WARNING******

Before disturbing building materials damaged by floodwaters, refer to the “Asbestos” paragraph in the section titles “Potential Dangers of Re-entering Damaged Buildings” for additional guidance. Materials that may contain asbestos include walls, ceilings, flooring or insulation (on ducts, pipes, mechanical equipment or attic).

Lodging Establishments and Institutions

Food and Beverages

All flooded food, including sealed and open packages, boxes, cans, and produce must be discarded to avoid food-borne illness or injury. Frozen foods which thawed but did not reach a temperature above 41°F may be refrozen.

Equipment

Thoroughly clean and sanitize all salvageable equipment. Use a detergent and a sanitizing solution made with one tablespoon of regular-strength, non-scented bleach in a gallon of water. You can generally save equipment if:

- It is made of stainless steel or other nonabsorbent materials.
- It contains only non-absorbent, closed cell polyurethane insulation. (This material is used in newer refrigerators and freezers. It may require cleaning, so check with the manufacturer.)

Refrigerators, freezers and other equipment with fiberglass insulation must be evaluated to see if the insulation has been flooded. If so, the insulation must be removed and replaced. Styrofoam or closed cell polyurethane insulation may be able to be cleaned, so check with the manufacturer. A thorough inspection of the electrical components (wiring, compressors, switches, etc.) must be performed by a professional to judge whether they need replacing. Use a reliable professional for these jobs. Often the cost in materials and time spent in refurbishing flood-damaged electrical equipment exceed the cost of replacement.

Check your water heater. It should be replaced if floodwaters got into the gas burner, electrical parts, or insulation.

Take the following precautions when salvaging post-mix and beverage machines, coffee or tea urns, ice machines, glass washers, dishwashers and other equipment with water connections:

- Flush waterlines, faucet screens and waterline strainers and purge fixtures of any standing water.
- Clean and sanitize all fixtures, sinks and equipment, using detergent first, followed by a solution of one tablespoon of bleach in a gallon of water.
- Also see Section (x), “Decontamination of Ice Machines.”

Discard any equipment that is either damaged and cannot be repaired to manufacturer standards or includes flood-damaged wood, particle board or plastic laminate components (counters, cabinets, bars, etc.)

Decontamination of Ice Machines

Do not begin decontamination procedure until the water supply problem has been corrected and the boil water notice has been lifted.

1. Disconnect and unplug the unit.
2. Discard all ice.
3. Disassemble removable parts of the machine that come in contact with the water used to make ice, including any pre-filters on the water supply line to the machine.

4. Thoroughly clean all parts, and check for possible repair needs.
5. Ensure the presence of an air space in the tubing that leads from the potable water inlet into the water distribution system of the ice-making machine.
6. Inspect for insect or rodent infestation under the unit, and treat if necessary.
7. Check the gasket around the door of the ice storage chest for cleanliness and possible leakage or dripping of contaminants into the ice storage chest.
8. Allow the ice storage chest to warm to room temperature.
9. Clean the storage chest with freshly made soap or detergent solution.
10. Use clean materials to scrub all surfaces, door tracks, guides and gaskets.
11. After cleaning, rinse all surfaces with clean tap water and wipe dry with clean materials.
12. Circulate a 50 to 100 parts per million chlorine solution throughout the entire ice-making and storage system of the machine in accordance with the manufacturer's recommended cleaning and sanitizing procedures.
13. Let the 50-ppm chlorine solution stay in the ice-making and storage compartment for four hours or at least two hours if it is a 100-ppm chlorine solution.
14. Flush with clean tap water.
15. Allow ice-storage chest to dry, and then return the unit to service.
16. Clean and sanitize ice scoops and containers used for handling ice.

These procedures were adapted from the Centers for Disease Control and Prevention recommendations for sanitary care and maintenance of ice-storage chests and ice-making machines in health care facilities (*AJIC Am J Infect Control 1998;26;111-2*).

Septic Systems

Septic tanks contain waste, and people can get sick from being exposed to the sewage found in septic tanks and flood waters. Heavy rainfall can make septic systems function improperly. After such an event, it may take several days for your system to return to normal. Pumping the tank immediately may not help. Use very little household water to prevent backups of sewage in your home.

Conserve water

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.

Know what to expect

When power to the system is restored, repairs may be necessary prior to returning to normal water use. The services of an electrician may also be needed if the sewage system's electrical units were flooded or had any physical damage.

Signs of damage

Most septic tanks are not damaged by a flood since they are below ground and completely covered. However, septic tanks or pump chambers can become filled with debris. Signs of damage include settling or inability to accept water. If you suspect your septic tank has been damaged, call a professional to inspect, service, and clean it.

After the storm

Removal of debris may damage a septic system. Vehicles can crush drainfields, tanks and distribution boxes, especially when the soil is saturated. Make sure no one drives in or around your septic tank and drainfield, and allow stumps to rot in place or have the stumps ground with a small stump grinder. Remove and discard household goods contaminated with sewage that cannot be disinfected, such as rugs, wall coverings and drywall. Always wear rubber boots and waterproof gloves when cleaning up sewage.

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.

For purposes of this manual, the following recommendations are categorized into two broad types of solid waste: putrescible and non-putrescible waste.

Putrescible Waste

Putrescible waste is capable of decay and spoilage, which creates an unfavorable environment for public health, and should be addressed promptly.

- Storage areas for garbage and refuse containers should be kept thoroughly clean in order to avoid attracting insects or rodents.
- Storage areas should be large enough to accommodate all of the containers needed by the operation in order to prevent the scattering of garbage and refuse.
- All containers should be maintained in good repair and cleaned as necessary in order to store garbage and refuse under sanitary conditions as well as to prevent the breeding of flies.
- Garbage containers should be available wherever garbage is generated to aid in the proper disposal of refuse.
- Outside receptacles should be constructed with tight-fitting lids or covers to prevent the scattering of the garbage or refuse by birds, breeding of flies or entry of rodents.
- Proper equipment and supplies should be made available to accomplish thorough and proper cleaning of garbage storage areas and receptacles, so unsanitary conditions can be eliminated.
- All wet food debris should be double-bagged before placing in dumpster.
- Arrangements should be made with the dumpster maintenance provider to ensure the dumpster can be emptied promptly or as needed.

Non-Putrescible Waste

For purposes of this manual, non-putrescible waste includes such items as cardboard boxes, dry cans, construction debris and yard debris.

- Domestic non-putrescible waste, such as cardboard boxes, dry cans and paper, should be stored separately from putrescible waste until disposal.
- Avoid placing non-putrescible debris in dumpster in order to conserve as much dumpster space as possible for putrescible debris.
- Yard debris should be stored separately from domestic and construction debris, and should be disposed of in the designated municipality or county site.
- Care should be taken when handling yard debris. Protective clothing should be worn to avoid insect stings and exposure to plant allergens.
- Construction waste should be stored separately from domestic and yard debris and should be disposed of in the designated municipality or county site.

- Care should be exercised when handling suspected harmful materials, such as asbestos and lead paint. Asbestos and lead-based paint issues should be referred to the Health Hazards Control Unit, N.C. DHHS/Division of Public Health, 1912 Mail Service Center, Raleigh, NC 27699-1912. Phone: (919) 707-5900.

Disposal of all debris should meet the requirements of the North Carolina Solid Waste Management rules. The North Carolina Division of Waste Management can be contacted at N.C. DENR, 401 Oberlin Road - Suite 150, Raleigh, N.C. 27605. Phone: (919) 508-8400.

Insects

The most common reasons for emergency room visits following a hurricane are stings and bites. Mosquitoes, stinging caterpillars, snakes, fire ants, wasps and hornets could cause problems as citizens begin the business of cleaning up after a hurricane.

Stinging Insects

Bees, wasps and hornets may have had their nests disturbed by a natural disaster, especially wind and rain. These insects can become very aggressive while trying to defend their disturbed nests and former nest sites. Before beginning clean-up activities, survey the site to see if bees, wasps or hornets are hovering in the area. If they are present, use a commercially-available pesticide labeled for wasp and hornet control to get rid of them before entering.

Stinging caterpillars such as the familiar saddle-back caterpillar, normally live in the canopies of trees and do not come into contact with humans. Toppled trees from excessive winds can put stinging insects into areas frequented by people cleaning up downed limbs. Caterpillar stings are very painful. To avoid them, wear long pants, long-sleeved shirts, socks and gloves when picking up and carrying limbs and leaves.

Insect repellants do not work on stinging insects. If prescribed by your physician for insect allergies, make sure you have epinephrine in your emergency kit; its use will help prevent anaphylactic shock if you are stung.

Mosquito-borne illness in North Carolina

La Crosse encephalitis (LAC)

Although rarely fatal, La Crosse encephalitis is the most common mosquito-borne illness in North Carolina. It is spread by tree-dwelling mosquitoes and is most common in the western part of the state. Symptoms occur from a few days to a couple of weeks after being bitten by an infected mosquito. These symptoms include fever, headache, nausea and vomiting. In

more severe cases, convulsions, tremors and coma can occur. Children under 16 years of age and the elderly are the most susceptible to the disease.

West Nile virus encephalomyelitis (WNV)

West Nile virus has been found across the state during past mosquito seasons. People typically develop symptoms between 3 and 14 days after being bitten by an infected mosquito, if they develop any symptoms at all. Most people who are infected with West Nile virus - approximately 80 percent - will not become ill. Up to 20 percent of the people who become infected will display mild symptoms, including fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms typically last a few days. About one in 150 people infected with WNV will develop severe illness. The severe symptoms can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis, and often require hospitalization. These symptoms may last several weeks, and neurological effects may be permanent. People over the age of 50 and those with weakened immune systems are more likely to develop serious symptoms of WNV if they do get sick.

Eastern Equine Encephalitis (EEE)

Eastern Equine Encephalitis is the most serious mosquito-borne illness in North Carolina. About fifty percent of human EEE cases are fatal, with young children and the elderly most at risk. Symptoms can develop from a few days to two weeks after being bitten by an infected mosquito. They include rapid onset of fever and headache and can resemble a case of the flu. Survivors of EEE infections may suffer from long-term effects to the nervous system. Therapy is limited to treating the symptoms of the disease, since there is no specific cure.

People who suspect they may have a mosquito-borne illness should contact their doctor.

Rabies

Rabies is now endemic in North Carolina. It is transmitted by exposure to mammals that have been infected with the virus. The infected animal may be able to transmit the disease and not show any symptoms. Specimens will need to be packaged according to federal shipping requirements. Counties should have available wrapping materials including labels, ice packs, insulated containers, and lab submission paperwork. Efforts should be made to hold animals for observation rather than submitting

animals that could have been observed to the lab for testing. Exposures to humans should always be evaluated by trained medical staff. For more information, please see (#) and (#) in the appendices.

Snakes and Other Reptiles

Areas which have been affected by floodwaters frequently become infested with snakes after the waters have receded. When working in areas after a flood, care should be taken to be observant for snakes even inside recently occupied buildings. Protective equipment such as snake gators or high leather boots should be worn.

Other reptiles, such as alligators, can also be pushed into populated areas after flooding. Only individuals trained for dealing with these types of animals should attempt to control or contain these animals. Keep people away from these dangers until trained personnel can respond.

Domestic Animals

Copies of current vaccination records should be available and kept with the animal. If it becomes necessary for the animal to be temporarily relocated, proof of vaccination (especially rabies) will be needed. The N.C. State Animal Response Team was formed after Hurricane Floyd to assist with domestic animal problems during emergencies.

Dead Animal Carcass Removal

During an emergency, animals may die and their carcasses need to be disposed of properly. Proper disposal is important to prevent the spread of pathogens and ground and surface water contamination as well as for pest control. Guidelines for animal burial following a natural disaster can be viewed online at <http://www.ncagr.com/oep/docs/isabel/Animalburialguidelines.pdf>.