

**Drought Response Guidance
for Public Health and Food Industry Professionals**

November 2007

THE GEORGIA WATER ADVISORY GROUP

**Georgia Department of Natural Resources Environmental Protection Division
Georgia Department of Human Resources Division of Public Health
Georgia Department of Agriculture**

Table of Contents

- 1.0 Executive Summary
- 2.0 Background on Current Situation
- 3.0 Communications Process
- 4.0 Public Health Issues Associated with Severe Drought Conditions
 - 4.1 Water Quantity
 - Hydration
 - Hygiene
 - 4.2 Water Quality
 - 4.3 Water Borne Disease
 - 4.4 Susceptible Populations
 - 4.5 Healthcare Facilities
 - 4.6 Food Safety
 - 4.7 Other Potential Health Risks
- 5.0 Recommendations and Guidance
 - 5.1 Susceptible Populations
 - 5.2 Private Well Owners
 - 5.3 Food Service Facilities
 - 5.3 Food Processing Facilities
 - 5.4 Food Retailers
 - 5.5 General Public
- 6.0 Appendices
 - A. Acronyms
 - B. Drought Contact Phone List
 - C. Well Water Brochure
 - D. Disease Surveillance
 - E. Water Borne Disease Information
 - F. References/Resources
 - G. Water Advisory Group Members

1.0 Executive Summary

The current drought in Georgia could potentially impact not only the quantity but the quality of Georgia's drinking water. The following drought guidance is to be used as a reference for background information as well as recommendations in protecting the health of Georgia citizens during current drought conditions.

This Drought Response Guidance document provides information for health care providers on susceptible populations, private well owners, hospitals and health care facilities, restaurant owners, food retailers and processors and is intended for use by Health Officers at the Districts, Local Health Departments, hospitals and primary care providers in communicating the risks associated with the current drought to susceptible populations, private well owners as well as the general public and by the food industry.

This document was developed by the Georgia Water Advisory Group (WAG) to address potential health impacts associated with the current drought. The WAG is an interagency advisory group which consists of members from the Georgia Division of Public Health (DPH), the Georgia Environmental Protection Division (EPD), the Georgia Department of Agriculture (GDA), and the Environmental Protection Agency (EPA, Region 4). The WAG was formed in 2005 to facilitate planning, communication and response to drinking water emergencies within the state. WAG members represent the following jurisdictional authorities:

EPD's Drinking Water Compliance Branch ensures that Georgia's public water systems are operating properly to supply safe drinking water to citizens and conducts water quality monitoring among regulated, municipal water systems.

DPH is responsible for primary surveillance, prevention activities and providing public information on water-borne diseases and other drinking water risks. DPH conducts these activities through a combination of outbreak detection and response and water quality programs designed to identify, prevent and abate conditions that adversely impact human health. DPH provides guidance to hospitals, health departments and healthcare facilities. Local health departments (LDH), provide guidance and laboratory testing of private well water. DPH also provides guidance to water quality issues to food service operations

GDA's Consumer Protection Division is responsible for overseeing the quality of water in bottled water and processed food products and for helping retail food stores deal with water quality issues to insure food safety.

All of these agencies are responsible for protecting the health of the public during a water quality emergency.

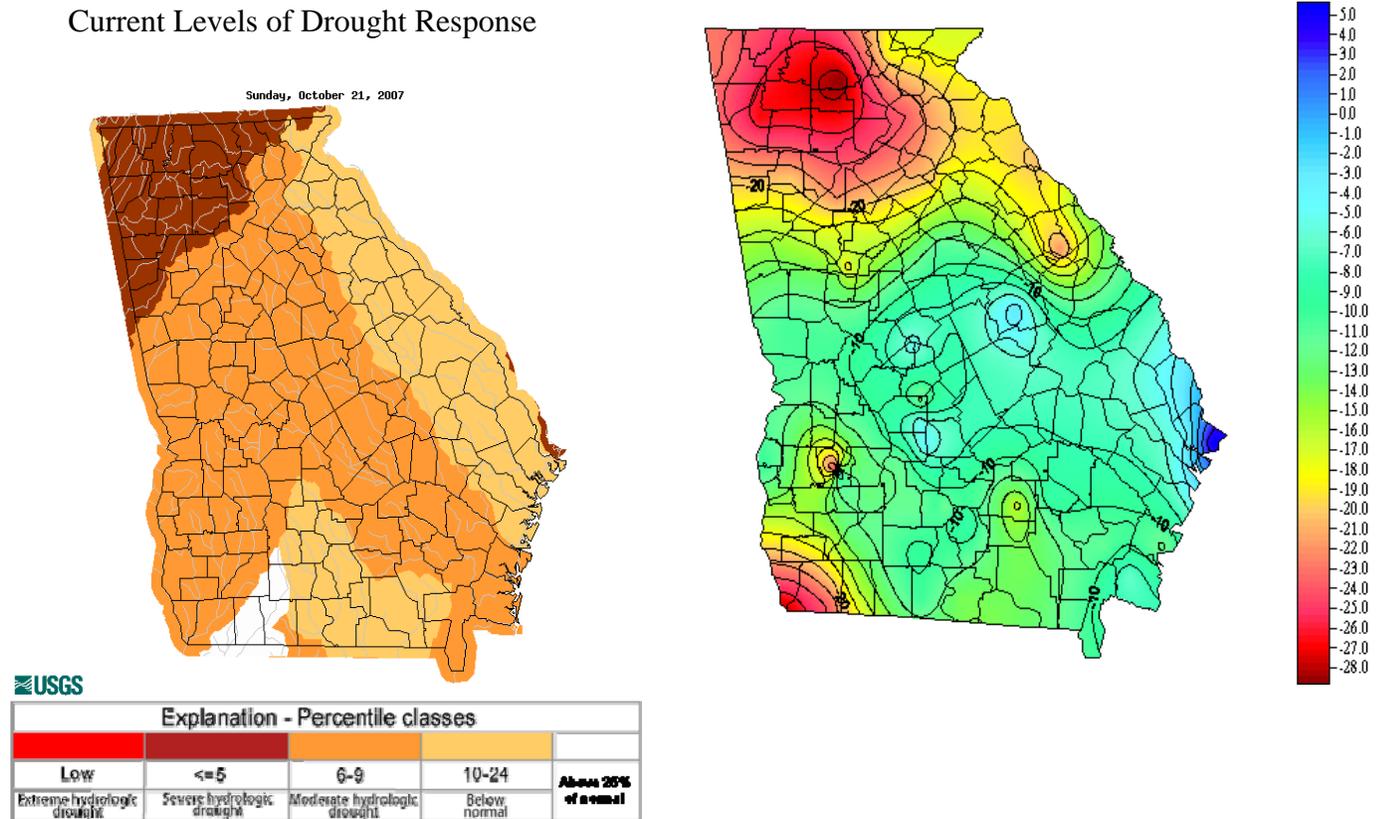
2.0 Background

Situation

Drought is a cyclical weather phenomenon, which can have a profound effect upon the State of Georgia. It is progressive in nature, and its presence may not be recognized until it reaches a severe level. Drought impacts the State with a variety of complex problems, which, if identified and evaluated, can be dealt with in a well-organized manner. The most significant impacts which confront the State are in the areas of agriculture, forestry, fish and wildlife, recreation and tourism, public and private water supplies, water quality, and economic impacts.

To illustrate the severity of the drought in Georgia, several maps are shown below. The first shows the deviation from normal precipitation levels recorded from January 1st, 2007 to October 31st, 2007. The second shows the levels of drought response in Georgia as of Oct 21st, 2007 as dictated by the Georgia Environmental Protection Division and the U.S. Geological Survey.

Current Levels of Drought Response



Precipitation in Inches, Jan 1 – Oct 31, 2007
Deviation from Normal 1971-2000

Version 1.0
(Revised Nov 15, 2007)

Situation Analysis (Current Conditions)

Lack of rain this year has caused the surficial aquifers to go dry. The surficial aquifers provide the base flow for Georgia's streams, providing flow between rain events. Flows in rivers across North Georgia are currently at record lows and have been for much of the summer. When we get rains, they add flow to the creeks and rivers from storm runoff, but the surficial aquifers are not recovering, so after the rain passes, the stream flows quickly return to drought levels. Many smaller water systems do not have sufficient raw water storage, so passing rain has only been a temporary help.

Drinking water intakes are designed to pump water at normal flow levels. As the lakes and rivers get low, many water systems are having problems getting water into their intakes. Also, low flows can lead to lower water quality. To treat the water to the same level of safety, the water systems must use more chemicals, and some water plants must switch to more effective chemicals, raising the cost to treat the water. Treating difficult water requires more vigilance from the operators, as the chemicals require a finer balance than under normal conditions. Operators must also be more vigilant about changing water quality. Less storage volume means that rain events or spills will change the water quality more than normal. Most drinking water plants are designed to have the flexibility to treat water in these conditions, but some plants in Georgia were designed to treat only water with good, stable water quality. These plants may need to connect to other water systems.

Water resources are prioritized with top priority going to services critical to the support of life, health, and hygiene; drinking and sanitation uses are second. Agriculture and industry uses are third and fourth priority. To support these use priorities, water quality priorities have been set. Microbiological water quality and acute safety will be highest priority. Non-acute concerns are second priority. Communicating and mitigating these relative risks will be a joint DNR-DHR task.

3.0 Communication Process

The chain of communications during a compromise in water quality or quantity is important to understand in order to conduct community risk assessments or plan outreach activities.

The Department of Natural Resources - Georgia Environmental Protection Division (EPD) is the state agency responsible for regulating and overseeing Georgia's public water supplies. During the state response to the current drought, the EPD is the lead agency. The EPD Drinking Water Compliance Program (DWCP) oversees the regulatory components of water quality among municipal water supplies. The Division of Public Health and the Department of Agriculture are support agencies. Issues of conservation and water quantity and quality are primarily overseen by EPD. When these issues impact public health and agriculture, then the DPH and the GDA provide guidance and recommendations, respectively. The Water Advisory Group (WAG) was formed to facilitate communication between agencies during events such as the drought.

Compromises in the quality of municipal water supplies are reported to regional and state authorities in the DWCP. Responses to reported problems may include a boil water advisory, a do not drink advisory, or a do not use advisory. Advisories are communicated by the water utility or EPD to the

public through public service announcements. In some jurisdictions, regional EPD authorities will also call the local Board of Health or Public Health District and provide this information. However, this is not consistent across the state. In some cases, compromises in water quality are communicated directly to the State EPD DWCP. When this occurs, the DPH and GDA are notified via the WAG phone tree, and the information is communicated to the appropriate local public health jurisdiction.

Since each agency has their specific responsibilities as well as their own internal communication process it is recommended that local-level communications are established between DPH, GDA, and the public water supply utilities and/or EPD jurisdictions. A list of phone numbers is provided in Appendix B of this document. This should be modified by each public health region to include the pertinent local contacts.

Overview of Communications

Public Health: Each Georgia Health District communicates with their county health departments. County health departments have an environmental health staff person who is responsible for public information and guidance on private wells. Communication should flow both ways between the county health departments and the health district offices. The State DPH's role is to provide guidance to the Health Districts and in turn, the Health Districts work with their individual county health departments.

The Department of Agriculture regulates, monitors, or assists with the following areas: grocery stores, convenience stores, food warehouses, bottling plants, food processing plants, pet dealers and breeders, animal health, meat processing plants, and bottled water.

The Georgia Emergency Management Agency(GEMA) is working on response plans with EPD and the supporting agencies. In working with all of the state agencies in responding to the drought, a Joint Information Center (JIC) has been opened so that one message comes out to the public. The media works on its own and there are times when it is confusing as to what information is correct. The JIC will be considered the official information source for state, county and local agencies and county and local government officials.

Current information can be found on the Georgia Drought JIC website: www.droughtJIC.org
This website will be updated on a regular basis.

4.0 Public Health Considerations

The U.S. has one of the safest drinking water supplies in the world. Public water suppliers monitor their water to make sure it complies with science-based public health standards, set by the U.S. Environmental Protection Agency under the Safe Drinking Water Act. During drought conditions, when the water levels in reservoirs, rivers and wells are low, there may be an effect on water quality. Potential changes in source water quality include increases in salinity, hardness, iron and manganese as well as microbial contamination and algal blooms. With these changes, there may be changes in taste, odor and appearance of drinking water. However, many of these changes do not represent specific, acute public health risks.

Public water suppliers will monitor the water quality and modify treatment when necessary. However, private wells in Georgia are not regulated. Georgia residents receiving water from private wells are responsible for making sure their drinking water is safe. All private wells should be tested regularly, even in the absence of drought conditions. Private well owners should monitor their well water for bacteria. For recommendations for private well owners see Section 5.2 and Appendix C .

There are several public health concerns associated with the current drought conditions. The first is the availability of an adequate amount of drinking water necessary to maintain health. The second is the quality of available drinking water.

4.1 Water Quantity:

Hydration: One major concern during drought conditions is that people will start to limit their drinking water intake. It is important to maintain an adequate intake of water to avoid dehydration. It is extremely important that athletes, the elderly, and persons with pre-existing health conditions such as diabetes and hypertension maintain their water intake during drought conditions.

General Hygiene: During drought conditions when conservation measures are in place, it is important to continue hand washing and other hygienic practices to protect health and limit the spread of infectious disease.

4.2 Water Quality:

As we begin to see more beach and less water at Lake Lanier and other Georgia lakes and rivers, we may consider the potential for increased levels of contaminants in the dwindling water, especially as sediments become resuspended. Public drinking water will continue to be treated and federal standards maintained, but adjustments in the supply and distribution system may result in temporary compromises in water quality and the subsequent issuances of water advisories.

4.3 Waterborne Disease:

With changes in quantity and quality of drinking water, there may be an increased risk of water borne disease in some circumstances. Regulated drinking water suppliers test regularly for US EPA-regulated contaminants and will adjust their water treatment to counter any decrease in source water quality. However, changes in water pressure within the distribution system associated with temporary changes in supply or distribution may also increase the risk of pathogens entering drinking water for a short time. Again, when this occurs in a regulated drinking water system, a water advisory will be issued with instructions about how to treat or use the water. In unregulated drinking water systems, such as private or unregulated ground water systems, water quality may be compromised immediately after a new well is dug, or if there are existing deficiencies in the well casing, depth, or wellhead protection.

As the water levels dwindle, contaminants and microorganisms remain and may lead to an increase in concentration in recreational water bodies, especially as sewage outfalls impact bodies of water with reduced flow rates. As a result, there may be an increased risk of waterborne disease associated with recreational contact with water.

Surveillance for waterborne disease The Georgia Division of Public Health, its Public Health Districts, Boards of Health and/or local health departments are responsible for surveillance, early detection of disease outbreaks, and response activities. Disease surveillance operations are conducted routinely, and include the detection of water-related illnesses. Additional, expanded surveillance efforts are commonly undertaken in response to reports of water quality compromise, disease outbreaks, illness clusters or other events of a communicable nature. More detailed surveillance information is found in Appendix D The table below highlights types of infectious pathogens, the likely time period between exposure and disease signs for your reference in the event of disease clusters or queries about water-related illness. Keep in mind there are some waterborne diseases that have longer incubation periods or can cause wound infections (recreational contact) that may be seen and require specific diagnostic tests. For more specific water borne disease information see Appendix E.

Pathogen	Time between exposure and symptoms	Symptoms	Contagious
Viruses	24 to 48 hours (range 10-50 hrs)	Nausea/vomiting, diarrhea, headache fever	yes
Bacteria	12 to 72 hours (range 3 hrs to 4 days)	Diarrhea-occasionally containing blood, fever, nausea/vomiting Wound infections especially among immune compromised persons or in deep cuts	Variable No
Protozoa	7 days – 23 days	Diarrhea, vomiting, abdominal cramping, rash, headaches, muscle aches	Yes

4.4 Susceptible Populations

For the general population, having a limited water supply should not impact overall health. However, for susceptible populations, both the availability of water and change in water quality need to be addressed. Susceptible populations include the following:

- Elderly
- Pregnant and nursing women
- Infants
- Immune suppressed (e.g., chemotherapy and AIDS patients)
- Dialysis patients
- Persons with pre-existing health conditions, such as hypertension and diabetes

The following table shows specific drinking contaminants which could possibly become more concentrated during a drought and the population(s) most susceptible to their adverse effects.

**Drinking Water Contaminants Which May Increase
During a Drought and Susceptible Populations at Risk**

Contaminant	Susceptible Population
Aluminum	Dialysis patients
Disinfection Byproducts (DBPs)	Elderly men, pregnant women
Fluoride	Infants
Lead	Fetus, children
Microbes	Elderly, children, immune suppressed
Nitrate	Pregnant women, infants
Pesticides	Pregnant women, children
Sulfate	Infants
Sodium	Persons with hypertension

R. Calderon; EPA, 2004

4.5 Hospitals and Healthcare Facilities

The primary concern for hospitals during the drought is maintaining an adequate supply of water to the facility. Hospitals and medical facilities will be asked to provide daily water use information to determine water rationing priorities in their communities. Hospital facilities personnel should have access to this information through monthly water bills and meter readings. Meanwhile, hospitals should evaluate their normal processes and identify ways in which water can be conserved. Some examples include:

- Adopting alternate schedules for bathing patients
- Using disposable plates and utensils for meals
- Using hand sanitizers and waterless shampoos
- Providing bottled water from sources outside of the drought area for drinking purposes

A secondary concern for facilities is ensuring water quality suitable for sensitive medical equipment and susceptible patients. Changes in water quality may affect sensitive equipment and harm susceptible patients, including:

- Pregnant women
- Infants
- Frail elderly
- Immune suppressed

Facilities should consider additional measures, such as on-site filtration/purification and/or the use of bottled water for consumption needs (e.g., drinking water, baby formula), to mitigate the risk to these populations.

Hospitals should explore additional measures to ensure access to potable water. Such measures may include increasing drinking water stockpiles, reopening existing or drilling new wells, and/or employing point-of-use water treatment systems within the facility.

Should the drought worsen, hospitals may be asked to restrict certain activities (e.g., cancel elective procedures) in an effort to conserve water. The Georgia Division of Public Health will continue to provide guidance for hospitals regarding water restrictions and water quality.

For additional information contact your Regional Coordinating Hospital or local Public Health office. Further Health Provider Resources:

Guidance for dialysis care providers

http://www.cdc.gov/ncidod/dhqp/dpac_dialysis_boilwater.html

Technical considerations for facilities after a disruption of water supply.

<http://www.bt.cdc.gov/disasters/watersystems.asp>

4.6 Food Safety

Water is an essential part of food safety. Handwashing is important in home and industry food safety, as is the washing of food preparation areas. Washing cleans and disinfects hands and work surfaces, which helps to prevent the spread of food borne diseases.

Listed in the Recommended Guidelines Section 5.4 are guidelines for food service during times when water may not be potable or available. Also included are recommendations for measures to be adopted by food service when working to conserve water. In addition, this section also contains recommended guidelines for water conservation practices for food processing facilities, emphasizing using water effectively and avoiding wasting water, and water saving tips for fresh food retailers.

County health department environmental health professionals insure proper precautions are taken in restaurants in the event of a compromise of water quality or quantity and have the authority to close those not compliant with requirements. Likewise, the Georgia Department of Agriculture has oversight over food processing facilities and food retailers.

While most of the resources are focused on food safety in retail and processing, food safety in the home must always be emphasized. Good hand hygiene, washing work surfaces, counters, dishes, and utensils with soap and water are all important in reducing the risk of food borne diseases. All good food hygiene practices can be maintained with an emphasis on water conservation.

4.7 Other Potential Health Risks Associated with Drought Conditions:

- Based upon the scarcity of water, access to health care may be impacted; e.g., hospitals and health care facilities may limit elective procedures.
- Changes in water supply influence mosquito populations and the burden of arboviral diseases. For the most current information on Georgia's mosquito and arboviral surveillance go to <http://oasis.state.ga.us/>

5.0 Recommendations and Guidance

This section includes drought recommendations and guidance for healthcare providers, private well owners, food service facilities, food processing facilities, food retailers and communication information for the general public. These recommendations and guidance will be updated during the drought as conditions and response recommendations change.

5.1 **RECOMMENDED DROUGHT GUIDANCE FOR SUSCEPTIBLE POPULATIONS**

The following are recommendations for susceptible populations within the State of Georgia in response to the current drought emergency:

- Consume an adequate daily amount of drinking water. (8-10 8 ounce glasses/day) In general, for Susceptible Populations, use of bottled water for consumption as well as mixing baby formula is recommended.
- Point of use filters installed in the home can be used to decrease levels of a variety of potential water contaminants. However, not all point-of-use filters on the market remove all types of contaminants. For example, most common tap filters remove only chemicals such as chlorine and lead. Consequently there are specific filters recommended for immuno-compromised persons, such as cancer and transplant patients, which remove contaminants and microbial organisms. See Section 5.6 on Point-of-Use Filters.
- If the Public Drinking Water Providers declare a “Boil Water Advisory”, all tap water used for consumption should be boiled according to their specification.
- Private drinking water supplies are not regulated and the quality is up to the individual well owner. The use of bottled water and boil water advisories should be recommended to susceptible populations who have private wells.
- General hygiene; Continue hand washing. To reduce water consumption, use hand sanitizers.

For more information, contact your local health department.

References:

General Water Quality Information

Water on Tap: What You Need to Know, U.S. Environmental Protection Agency

www.epa.gov/safewater/wot/index.html

Guidance for people with Severely Weakened Immune Systems

www.epa.gov/safewater/crypto.html

5.2 RECOMMENDED DROUGHT GUIDANCE FOR PRIVATE WELL OWNERS

The following are recommendations for private well owners within the State of Georgia in response to the current drought emergency:

Long periods of extreme drought may have several impacts to your private well that can make you or your family sick. It is possible for shallow wells to run dry during an extended period of severe drought. There is also potential for microbial contamination in shallow wells, and some wells may be susceptible to nitrates from agricultural run off.

- **Conserve water and reduce water use**
 - Limit your outdoor water use (watering lawns and washing cars)
 - Take shorter showers
 - Turn off the water when shaving or brushing teeth
 - Run full loads only (washing machines and dishwashers)

- If you detect a difference in the taste, smell or appearance of your well water, you should have your well water tested.

- Contact your local Health Department about well testing and associated fees.

For questions about water conservation or private well water sampling, contact your local County Health Department or University of Georgia Cooperative Extension.

_____ County Health Department: <i>Ph</i> _____

_____ County UGA Extension Office: <i>Ph</i> _____
--

Additional Resources

Water Conservation Tips: www.h2ouse.org or www.conservewatergeorgia.net

Georgia Division of Public Health Environmental Health Well Water Quality Brochure(Appendix B) or <http://health.state.ga.us/programs/hazards/publications.asp>

University of Georgia Cooperative Extension
www.fcs.uga.edu/ext/housing/water.php

5.3 RECOMMENDED DROUGHT GUIDANCE FOR FOOD SERVICE FACILITIES

The following are recommendations for food service facilities within the State of Georgia in response to the current drought emergency:

I. Public Water Service Disruption (No Available Water or Water of Un-Safe Quality):

- Without adequate potable water, employees cannot wash their hands, cook and prepare foods and clean and sanitize equipment appropriately to prevent foodborne illness. Likewise, restrooms quickly become health hazards without running water. In fact, disruption of a food service establishment's potable water supply for more than two (2) hours is considered as one of the imminent health hazard listed within the Georgia Food Service Rules and Regulations Chapter 290-5-14 Rule .03 Subsection (2)(n). Under such conditions, it is required that the person-in-charge immediately discontinue his food service operation and notify the Health Authority.
- A food establishment closed because of a disruption of safe water supply must not reopen until safe water service is restored and the local Health Authority approves reopening of the establishment.

II. Food Service Establishment Water Conservation Efforts:

- Check water supply plumbing for leaks and turn off any unnecessary flow.
- Repair dripping faucets and continuously running or leaking toilets.
- Install flow reducers and faucet aerators in all plumbing fixtures whenever possible.
- As appliances or fixtures wear out, replace them with water-saving models.
- Reduce the water used in toilet flushing by either adjusting the vacuum flush mechanism or installing toilet tank displacement devices (dams, bottles, bricks, or bags).
- Turn dishwasher off when not in use. Wash full loads only.
- Do not use running water to melt ice or frozen foods. Thaw foods in refrigeration or as part of the cooking process.
- Use water-conserving ice makers and ice in recipes instead of water whenever possible.
- Presoak utensils and dishes in ponded water instead of using running water rinse.
- Use commercially pre-washed fruits and vegetables or eliminate them altogether from the menu.
- Serve water to customers upon request or do not serve it at all.
- Do not hose down parking lots, sidewalks, and driveways unless absolutely necessary.

III. Water Clarity and Quality Issues resulting from Public Water Supply Depletion:

- If the water supply is from a well, methodologies for water supply monitoring and regulation as established by memorandum of understanding between GA DHR and GA EPD dated January 29, 2002 should be continued.
- If the water supply is by way of a public distribution system, the same methodologies for monitoring well water supplies at the food establishment could be employed to insure that particulates contained within the water do not exceed known standards that safeguard against long-term health risks. Closure of food establishments operations could be considered based upon results of such monitoring of the establishment's internal water supply system.
- Properly sized and installed water filters and or water conditioning devices may be useful in the removal of discoloration, sediment, and off-odors from over chlorination from the water supply within the food establishment.

5.4 RECOMMENDED GUIDANCE FOR FOOD PROCESSING FACILITIES:

The following are recommendations for food processing facilities within the State of Georgia in response to the current drought emergency:

Water Saving Tips for Food Processing Facilities:

GENERAL SUGGESTIONS

- * Appoint a water conservation coordinator with the responsibility and authority for the water conservation program.
- * Make the plant manager and other employees aware of the water conservation coordinator's function.
- * Increase employee awareness of water conservation:
 - Explain the importance of individual actions to the success of the program.
 - Seek employee ideas for water conservation using contests, rewards, and suggestion boxes.
- * Read water meter daily to monitor and report the success of water conservation efforts.

SURVEY THE PLANT: A plant survey helps to establish facility water savings potential by identifying areas where water is wasted or where water could be reused.

- * Identify the major water lines. Determine the quality, quantity, and temperature of water carried by each.
- * Identify all points where water is used, including hose connections. Determine the quantity of water used at each point.
- * Determine the capacity of each water-containing unit and frequency of emptying.
- * Determine the capacity of each continuous discharge not yet being reused.
- * Determine flow rates in floor gutters and whether the flows are adequate to prevent solids accumulation.

EVALUATE SURVEY

- * Review the information developed during the survey to identify the major water-using operations and review the water re-use practices currently employed.
- * Develop plans to improve re-use:
 - Evaluate the feasibility of installing cooling towers.
 - Study the potential for screening and disinfecting reclaimed water to increase the number of times it can be re-used.

MAXIMUM WATER-USE EFFICIENCY

- * Install high-pressure low-volume nozzles on spray washers.
- * Use fogging nozzles to cool product.
- * Install in-line strainers on all spray headers; inspect nozzles regularly for clogging.
- * Adjust pump cooling and flushing water to the minimum required.
- * Use conveying systems that use water efficiently.
 - Handle waste materials in a dry state when possible.
 - Use conveyor belts for product transport; preference should be given to "rabbit- ear" or "V" shaped roller supports because these are much easier to clean.
 - Use pneumatic conveying systems wherever possible.
 - Use flumes with parabolic cross sections rather than flat- bottom troughs.
- * Establish optimum depth of product on conveyors to maximize wash water efficiency.
- * Replace water-intensive units with alternatives - Rubber-disk units for raw product cleaning and peeling, Steam for water blanchers, or Evaporative coolers for hydrocooling systems.
- * Determine whether discharges from any operation can be substituted for fresh water supplied to another operation.
 - Divide the spray wash units into two or more sections and establish a counter flow re-use system.
 - Use reclaimed water for flushing floor gutters.
 - Replace high-volume hoses with high pressure, low-volume cleaning systems.
 - As equipment wears out, replace with water-saving models.
- * Discharges that can potentially be re-used are:
 - final rinses from tank cleaning, keg washers, fermenters
 - bottle and can soak and rinse water
 - cooler flush water, filter backwash
 - pasteurizer and sterilizer water.
- * Areas of possible re-use are:
 - first rinses in wash cycles
 - can shredder, bottle crusher
 - filter backflush
 - caustic dilution
 - boiler makeup
 - refrigeration equipment defrost
 - equipment cleaning, floor and gutter wash.

AVOID WASTE

- * Handle waste materials in a dry mode if possible
- * Equip all hoses with spring loaded shutoff nozzles. Be sure these nozzles are not removed.
- * Instruct employees to use hoses sparingly and only when necessary.
 - Adjust flows from recirculation systems (washers, flumes) by controlling the rate of makeup water.
 - Install float-controlled valve on the makeup line.
 - Close filling line during operation.

- Provide surge tanks for each system to avoid overflow.
- * Turn off all flows during shutdowns (unless flows are essential for clean-up).
 - Use solenoid valves to stop the flow of water when production stops.
 - The valves could be activated by tying them to drive motor controls.
- * Adjust flows in sprays and other lines to meet the minimum requirements.

EVALUATE CLEAN-UP PROCEDURES

- * Sweep and shovel solid materials from the floor; do not use hoses for this purpose:
 - Provide an adequate number of receptacles for collecting solids.
 - Empty the receptacles frequently to prevent odor and insect problems.
- * Inventory all cleaning equipment (such as hoses) provided in the plant:
 - Determine the number and types of units provided.
 - Evaluate their frequency of operation; and
 - Use more water-efficient equipment where possible.
- * Inventory all cleaning chemicals used in the facility to determine:
 - Are they being used correctly?
 - Is water use efficient?
 - Control belt sprays with a timer to allow for the intermittent application for chlorinated water.

EXTERIOR AREAS

- * Discontinue using water to clean sidewalks, driveways, loading docks, and parking lots.
- * Consider using mobile sweepers and vacuums.
- * Wash autos, buses, and trucks less often.
- * Avoid plant fertilizing and pruning that would stimulate excessive growth.
- * Remove weeds and unhealthy plants so remaining plants can benefit from the water saved.
- * In many cases, older, established plants require only infrequent irrigation. Look for indications of water need, such as wilt, change of color, or dry soils.
- * Limit landscaping additions and alterations. In the future, design landscapes requiring less water.
- * Install soil moisture overrides or timers on sprinkler systems.
- * Time watering, when possible, to occur in the early morning or evening when evaporation is lowest.
- * Make sure irrigation equipment applies water uniformly.
- * Mulch around plants to reduce evaporation and discourage weeds.
- * Remove thatch and aerate turf to encourage the movement of water to the root zone.
- * Avoid runoff and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters.
- * Wash food delivery and transport vehicles less often.

Related Topics:

Drought Home: <http://www.mde.state.md.us/Water/Drought/index.asp>

Drought Coordinators: <http://www.mde.state.md.us/Water/Drought/coordinators/>

5.5 RECOMMENDED DROUGHT GUIDANCE FOR FOOD RETAILERS:

The following are recommendations for food retailers within the State of Georgia in response to the current drought emergency:

Water Saving Tips for Retailers:

GENERAL SUGGESTIONS

- * Increase employee awareness of water conservation.
- * Seek employee suggestions on water conservation; locate suggestion boxes in prominent areas.
- * Conduct contests for employees (e.g., posters, slogans, or conservation ideas).
- * Install signs encouraging water conservation in employee and customer restrooms.
- * When cleaning with water is necessary, use budgeted amounts.
- * Read water meter weekly to monitor success of water conservation efforts.
- * Assign an employee to monitor water use and waste.
- * Determine the quantity and purpose of water being used.
- * Determine other methods of water conservation.
- * Serve water only when requested by customer.

BUILDING MAINTENANCE

- * Reduce the load on air conditioning units by shutting off air conditioning when and where it is not needed.
- * Check water supply system for leaks and turn off any unnecessary flows.
- * Repair dripping faucets, showers and continuously running or leaking toilets.
- * Install flow reducers and faucet aerators in all plumbing fixtures whenever possible.

Reduce the water used in toilet flushing by either adjusting the vacuum flush mechanism or installing toilet tank displacement devices (dams, bottles, or bags).

- * As appliances or fixtures wear out, replace them with water-saving models.
- * Shut off water supply to equipment rooms not in use.
- * Minimize the water used in cooling equipment, such as air compressors, in accordance with the manufacturer recommendations.
- * Keep hot water pipes insulated.
- * Avoid excessive boiler and air conditioner blow down. Monitor total dissolved solids levels and blow down only when needed.
- * Switch from wet or steam carpet cleaning methods to dry powder methods.
- * Instruct clean-up crew to use less water for mopping.
- * Change window cleaning schedule from periodic to an on-call/as required basis.

FOOD PREPARATION AREA

- * Turn off the continuous flow used to clean the drain trays of the coffee/milk/soda beverage island; clean the trays only as needed.
- * Turn dishwasher off when not in use. Wash full loads only.
- * Replace spray heads in dishwasher to reduce water flow. Use water from steam tables to wash down cooking area.
- * Do not use running water to melt ice or frozen foods.
- * Use water-conserving ice makers.
- * Recycle water where feasible, consistent with state and county requirements.
- * Recycle rinse water from the dishwasher or recirculate it to the garbage disposal.
- * Do not let water run in preparation sink.

EXTERIOR AREAS

- * Discontinue using water to clean sidewalks, driveways, loading docks, and parking lots.
- * Consider using mobile sweepers and vacuums.
- * Wash autos, buses, and trucks less often.
- * Avoid plant fertilizing and pruning that would stimulate excessive growth.
- * Remove weeds and unhealthy plants so remaining plants can benefit from the water saved.
- * In many cases, older, established plants require only infrequent irrigation. Look for indications of water need, such as wilt, change of color, or dry soils.
- * Limit landscaping additions and alterations. In the future, design landscapes requiring less water.
- * Install soil moisture overrides or timers on sprinkler systems.
- * Time watering, when possible, to occur in the early morning or evening when evaporation is lowest.
- * Make sure irrigation equipment applies water uniformly.
- * Mulch around plants to reduce evaporation and discourage weeds.
- * Remove thatch and aerate turf to encourage the movement of water to the root zone.
- * Avoid runoff and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters.
- * Wash food delivery and transport vehicles less often.

Georgia Department of Agriculture Rules and Regulations:

The following link is to the Georgia Department of Agriculture internet website. The directions that follow will lead to the current Georgia Department of Agriculture 40-7-1 regulations applicable to the food industry in Georgia.

www.agr.georgia.gov

- 1) Select Divisions;
- 2) Click on Consumer Protection Division;
- 3) Click on Consumer Protection Administration;
- 4) Click on General Rules

5.6 DROUGHT INFORMATION AND GUIDANCE FOR THE GENERAL PUBLIC

The following information on Boil Water Advisories, Do Not Drink/Do Not Use Advisories and Point of Use Filters is provided for public information and communication..

Boil Water Advisories

Boil Water Advisories are issued when an event has occurred allowing the possibility for the water distribution system to become contaminated. An advisory does not mean that the water is contaminated, but rather that it could be contaminated; because the water quality is unknown, customers should assume the water is unsafe to drink and take the appropriate precautions.

Why has a boil water advisory been issued? A boil water advisory is issued to protect the community from waterborne infectious agents like *Cryptosporidium* or *Giardia*.

Boiling water does not get rid of heavy metals, such as lead or mercury from water, nor does it take chemicals or pesticides out of the water. Boiling water for times exceeding one minute does not make the water any cleaner or more pure.

What do I do during a boil water advisory? For personal use, create a supply of water for cooking, drinking, and tooth brushing by bringing water to a rolling boil for 1 minute. Timing starts when the water starts to bubble. Cool the water then place in clean containers for use or refrigerate.

Hot (not boiled) soapy water can be used for dishwashing and kitchen/bathroom surface cleaning. As a precaution, add one tablespoon of bleach per gallon. Laundry water does not need to be treated. Unless specifically listed, water for showering does not need to be treated.

To improve the flat taste of boiled water, aerate it by pouring it back and forth from one container to another and allow it to stand for a few hours, or add a pinch of salt for each quart or liter of water boiled.

When can I stop boiling my water? And what do I do when it's over? Your local health department will issue a notice when the water supply has been thoroughly tested and deemed safe by federal standards.

After an advisory or notice has been lifted you should flush household pipes, ice makers, water fountains, etc. prior to using for drinking or cooking. Flushing simply means letting the water run to ensure that no contaminated water remains in your pipes. Follow these guidelines for flushing:

- Run all cold water faucets in your home for one minute
- To flush automatic ice makers, make three batches of ice and discard
- Run water softeners through a regeneration cycle
- Run drinking water fountains for one minute
- Run water coolers with direct water connections for five minutes.

“Do Not Drink” and “Do Not Use” Water Advisories

A *Do Not Drink Notice* will be issued when the water contains a chemical contaminant that cannot be removed by boiling. In this case, bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, making ice and food preparation until further notice.

During a Do Not Drink/Do Not Use Advisory, the following guidelines should be followed:

Do not drink, brush teeth, bathe, shower in or swim in the water

Do not wash clothes or wash dishes

Do not let pets drink or bathe in the water

Do not boil the water – boiling water may release more toxins in the water.

Additional Information on water advisories can be found at:

http://www.charlestonwatersystem.com/custserv_svc_intptns_boil_advisory.htm#WhatisaBoilWaterAdvisoryIsitthesameasaBoilWaterNotice

Point-of-Use Filters

Point-of-use filters can be used in the home to decrease levels of a variety of potential water contaminants, such as metals, chemicals, and microbial organisms. These filters are recommended for immune-compromised persons, such as cancer and transplant patients who are taking certain immunosuppressive drugs or those with chronic diseases like HIV/AIDS. There are a wide variety of point-of-use filters sold under many different brand names. To determine what each filter is meant to eliminate or reduce in drinking water, please consult this website:

NSF/ANSI Certified water filtration systems searchable by brand (Brita, Pur, etc.), type of filter (faucet, pour-trough, etc.), or reduction claims (metal, chemical, cyst reduction).

<http://www.nsf.org/Certified/DWTU/>

<http://www.cdc.gov/crypto/factsheets/filters.html>

6.0 APPENDICES:

- A. Acronyms
- B. Drought Contact Phone List
- C. Well Water Brochure
- D. Disease Surveillance
- E. Water Borne Disease Information
- F. References/Resources
- G. Water Advisory Group Members

APPENDIX A

WAG DROUGHT GUIDANCE ACRONYMS

DHR	Department of Human Resources
DNR	Department of Natural Resources
DPH	Division of Public Health
DWCP	Drinking Water Compliance Program(EPD)
EPA	U.S. Environmental Protection Agency
EPD	Environmental Protection Division
GDA	Georgia Department of Agriculture
GEMA	Georgia Emergency Management Agency
GIS	Geographic Information Systems
ICP	Infection Control Practitioner
JIC	Joint Information Center
LHD	Local Health Department
WAG	Water Advisory Group

APPENDIX B

Phone List		
PREPARED BY THE WAG		Rev. Oct. 2007
KEY WORD	RESPONSIBLE OFFICE	TELEPHONE
Air Quality Compliance	Air Protection Branch (EPD)	404-363-7000
Bacteria (fecal coliform) 1. Lab results 2. In drinking water 3. In rivers and lakes	1. Bacteriology Laboratory 2. Drinking Water Permitting & Engineering Program 3. Watershed Planning & Monitoring Program	1. 404-206-5200 2. 404-656-2750 3. 404-675-6236
Boil water advisories	Drinking Water Compliance Program	404-656-2750
Bottled water 1. Quality 2. Supply	1. Department of Agriculture 2. GEMA SOC	1. 404-656-3621 2. 1-800-TRY-GEMA
Cross connections/backflow prevention	Drinking Water Compliance Program	404-656-2750
Customer Assistance Program	Environmental Protection Division(EPD)	888-373-5947 404-657-5947
EPD District Offices 1. Mountain District Office(Atlanta) 2. Mountain District Office (Cartersville) 3. Northeast District Office(Athens) 4. West Central District Office (Macon) 5. Coastal District Office (Brunswick) 6. Coastal District Office (Savannah) 7. Southwest District Office (Albany) 8. East Central Office (Augusta) 9. West Central Office (Columbus))	1. 4244 International Pkwy Suite 114, Atlanta 30354 2. P.O.Box 3250. 16 Center Road, Cartersville, GA 30120 3. 745 Gaines School Rd, Athens 30605 4. 2640 Shurling Dr. Macon 31211 5. One Conservation Way, Brunswick 31520-8687 6. 6555 Abercorn St, Suite 130, Savannah 31405 7. 2024 Newton Rd, Albany 31701-3576 8. 1885 Tobacco Rd, Suite A, Augusta, 30906 9. 3100 Gentain Blvd, Columbus, 31907	1. 404-362-2671 2. 770-387-4900 3. 706-369-6376 4. 478-751-6612 5. 912-264-7284 6. 912-353-3225 7. 229-430-4144 8. 706-792-7744 9. 706-562-1571
Drinking water taste and odor 1. Private wells 2. Public water system-well/springs 3. Public water system-surface water	1. County Health Department 2. District Office 3. Drinking Water Compliance Program	1. Check County I listings 2. See District Office 3. 404-656-4807

Emergencies, 24 hour reporting	State Operations Center	1-800-TRY-GEMA
Environmental health	Department of Human Resources	404-657-6534
Environmental Protection Agency	US EPA Region 4 Atlanta	404-562-9900
Environmental toxicology	Environmental Toxicology Coordinator 1. Atlanta office 2. Athens office	1. 404-656-4713 2. 706-369-6376
Epidemiology	1. Business Hours 2. After Hours	1. 404-657-2588 2. 1-866-PUB-HLTH
Fish kills 1. Non-emergency 2. Emergency	1. District Office 2. State Operations Center (Atlanta) State Operations Center (statewide number)	1. See District Office 2. 404-656-4300 800-241-4113
Groundwater problems	Drinking Water Compliance Program	404-656-2750
Groundwater withdrawals	Water Resources Management Program	404-656-3094
Industrial wastewater treatment plants	Water Protection Industrial Wastewater Unit	404-362-2680
Lead & copper (in water)	Drinking Water Compliance Program	404-656-2750
Leak detection (water pipes)	Drinking Water Compliance Program	404-656-2750
Municipal wastewater lift stations	Water Protection Permitting Compliance & Enforcement Program	404-362-2680
Nonpoint discharge	Water Protection Nonpoint Source Program	404-675-6240
NPDES (wastewater) permits	Water Protection Permitting Compliance & Enforcement Program	404-362-2680
Odors, wastewater treatment plants	1. Water Protection Permitting Compliance & Enforcement Program 2. District Office	1. 404-362-2680 2. See District Office
Public Health Districts		See District Office
Public water system permits	Drinking Water Permitting & Engineering Program	404-656-4807
Public information	Drought Joint Information Center	www.droughtjic.org
Regional reservoirs	Water Resources Management	404-656-3094
Septic systems 1. domestic or household 2. non-domestic	1. County Health Department 2. Geologic Survey Branch	1. Check County listings 2. 404-656-3214

Septic tank problems	County Health Department	Check County listings
Sewage spills and leaks	EPD District Office	See District Office
Sewage treatment plants	Water Protection Permitting Compliance & Enforcement Program	404-362-2680
Spills (oil, chemical, toxic, etc.)	State Operations Center GEMA	1-800-TRY-GEMA
Utilities	Public Service Commission	404-559-6600
Water-borne illnesses (e.g., giardia) from drinking water	Drinking Water Compliance Program	404-656-4807
Water conservation	Drinking Water Compliance Program	404-656-4807
Water system plans & specifications	Drinking Water Permitting & Engineering Program	404-656-2750
Well water problems	<ol style="list-style-type: none"> 1. Private (individual wells) 2. Public 	<ol style="list-style-type: none"> 1. Check County Health Dept Listings 2. 404-656-4807
Water use restrictions	Drinking Water Permitting & Engineering Program	404-656-2750

APPENDIX C

Well Water Brochure

WATER WELL QUALITY



CHEMICAL HAZARDS PROGRAM

Environmental Health and Injury Prevention Branch

DIVISION OF PUBLIC HEALTH



Is my well water safe?

Having clean well water is important. For homes that use individual water wells, there can be certain risks involved. The water in your well can be exposed to and become contaminated from various hazards. The water in your well can make you sick if it is not safe. Since there are no federal or state monitoring regulations for private wells, it is the homeowner's responsibility to make sure their well water is safe to drink. Well water may not be safe to drink if:

- ✚ you have frequent and unexplained illnesses in your household
- ✚ your neighbors find toxic chemicals in their well water
- ✚ you detect a difference in the taste, smell, or color of your well water
- ✚ you spill fertilizers, pesticides, oil, gasoline, or other toxic substances on the ground near the well or in the well

What are some ways to keep my well water safe?

- ✚ *Doing regular well inspections and disinfections*
- ✚ *Keeping poisons, pesticides, chemicals, and pet waste off the ground and away from your well*
- ✚ *Taking proper care of your septic system*
- ✚ *Having your well professionally tested at least once a year*

How do I inspect my well?

Things can enter into your well to harm you and your family. It is important to regularly inspect your well for sources of contamination. Other potential problems can exist with the slab, the well screen, the building covering the well, and/or landscaping. What are some first signs of dangers that you should have a professional examine?

- ✚ Cracks and holes in the well casing
- ✚ A moveable well casing
- ✚ A leaking valve or hearing running water from the casing



Potential sources of well water contamination

Pesticides, including insecticides and herbicides, used to kill bugs and plants should be used sparingly. Fuels like gasoline and oil are also poisons that should not be stored near a well. Do not store gasoline operated equipment such as lawn mowers near your well because gasoline or oil can leak onto the ground and travel to the water that is in your well. It is important to keep assorted chemicals and pet waste 100 feet away from your well. These chemicals and waste can drain onto the ground and get into the water that is in your well.

Buy only enough chemicals like pesticides and fuels that you need. Do not keep half empty containers around or reuse the containers for any other purpose. Wrap empty containers in paper and throw them into the trash or take them to a collection facility for disposal.

Well water disinfection

To disinfect your well, household bleach should be used. The bleach should be poured into the well taking care to include the sides of the well. Connect a hose to the nearest faucet and direct water back into the well for about 30 minutes. The entire plumbing system should then be opened until chlorine is smelled in the water and then each opening closed and the chlorinated water allowed to stand in the system at least 10 to 12 hours. Seal all openings into the well (pipe and wire holes) and around the well cap. After chlorine has been in the system for the allotted time, run the plumbing openings until no chlorine is left in the water.



If I suspect a problem, who should I contact?

If you suspect there may be a problem with your well water, there are some guidelines you need to follow to protect your health.

- ✚ ***Contact a licensed well driller to inspect your water well.***
- ✚ ***Have your well tested for bacteria regularly, especially after well water disinfections. Your County Cooperative Extension Service and County Health Department, Environmental Health Section, can test your well water for bacteria.***
- ✚ ***Contact your County Health Department, Environmental Health Section, about taking proper care of your septic system. Septic system problems can also affect your well water quality.***
- ✚ ***Contact your County Cooperative Extension Service to test your well water for chemicals.***

FOR MORE INFORMATION

Georgia Division of Public Health

Chemical Hazards Program
(404) 657-6534 <http://health.state.ga.us/programs/hazards>

County Health Department

Environmental Health Section

<http://health.state.ga.us>

University of Georgia

Cooperative Extension Service
www.caes.uga.edu/extension

County Extension Agent



Supported in part by funds from the Comprehensive Environmental Response, Compensation, and Liability Act trust fund through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

DPH05/100HW

APPENDIX D

Disease Surveillance:

Epidemiologic surveillance is delineated into three conceptual, operational stages which correspond to the level of effort required to conduct operations at that level. The decision to escalate from one level of surveillance activity to the next will be made using all available, relevant information and the potential risk of illness in a community or population.

In the event of water rationing, the detection of a potential cluster of water-related illness, or a boil water advisory or notification of water quality compromise, a risk analysis should be conducted based on discussions with public health partners, such as community water supply officials, the Georgia Division of Public Health, and other appropriate officials. Enhanced surveillance procedures and local outreach to restaurants may be considered necessary.

Stages of Surveillance

a. Passive surveillance: This level describes standard, daily operating procedures. It includes disease or syndrome monitoring through surveillance systems that rely on reporting to the public health agency by healthcare providers; ICPs; hospital, private and State laboratory staff; correctional facility staff; medical examiners or coroners, or school or occupational health nurses. Epidemiologists regularly review data from these systems to monitor disease trends and to detect clustering. If District and State public health officials detect any unusual disease activity (i.e., increased incidence or unusual circumstances or symptoms), they may initiate enhanced surveillance efforts.

b. Enhanced surveillance: During enhanced surveillance focused attention will be paid to detecting cases involving a specific disease, pathogen or syndrome. District and State epidemiologists begin a coordinated contact of relevant agencies, authorities and institutions to alert personnel to the possibility of an event of an infectious, communicable nature and request added vigilance for a predetermined period of time specific to the disease, pathogen or syndrome in question. Public health officials may refer to multiple disease reporting systems to verify or validate any potential increase in illness. For example, in the event of a particular threat within a water distribution system or subpopulation, GIS-based surveillance methods may be included in enhanced surveillance activities. The intensity of enhanced surveillance will be based upon the level of risk determined by the available, relevant information at the time.

Active surveillance: When there is reason to suspect a significant disease or exposure event, District and State epidemiologists will begin to actively seek cases of specific diseases or syndromes in their jurisdiction. This level of surveillance is time and effort intensive. It is typically conducted for defined periods of time or if there is reason to suspect a significant threat to the community or population.

APPENDIX E

Water Borne Disease Information

Disease	Most likely time between exposure and symptoms (incubation period)	Symptoms	Contagious
Viruses <u>Food/Waterborne viruses (e.g. enteroviruses, noro virus)</u>	24 to 48 hours (Range 10 to 50 hours)	Nausea/vomiting, diarrhea, headache, fever	Yes
Bacteria <u>Food/Waterborne bacteria (e.g. Salmonella, Campylobacter, E. coli O157:H7)</u>	12 to 72 hours (Range 3 hours to 4 days)	Diarrhea—occasionally containing blood, fever, nausea/vomiting	Variable
<u>Bacteria associated with water or soil (e.g. Pseudomonas, E. coli, Clostridium spores)</u>	Variable, depending upon wound severity and management	Wound infections, especially among immune compromised persons or in deep cuts	No
<u>Leptospirosis</u>	10 days (Range 2 to 30 days)	Headache, chills, fever, muscle aches (especially legs), rash	Very rare
Protozoa			
<u>Cryptosporidiosis</u>	7 days (Range 1-12 days)	Diarrhea, vomiting, abdominal cramping	Yes
<u>Giardiasis</u>	7 to 10 days (Range 3-25 days)	Diarrhea, abdominal cramping	Yes
<u>Toxoplasmosis</u>	5 to 23 days	Immune compromised persons: rash, headaches, eye damage, pneumonia, muscle aches Pregnant women: rare cases of fetal eye or brain damage	No

APPENDIX F

References:

Georgia Water Conservation

http://www.conservewatergeorgia.net/Documents/georgia_drought.html

USGS Drought Watch

<http://water.usgs.gov/waterwatch/?m=dryw&r=us&w=dryw%2Cmap>

Georgia Automated Environmental Monitoring Network (from UGA College of Agricultural and Environmental Sciences)

<http://www.georgiaweather.net/>

City of Atlanta Bureau of Water

<http://apps.atlantaga.gov/citydir/water/waterconservation.htm>

Guidance for dialysis care providers

http://www.cdc.gov/ncidod/dhqp/dpac_dialysis_boilwater.html

Technical considerations for facilities after a disruption of water supply.

<http://www.bt.cdc.gov/disasters/watersystems.asp>

The Georgia Drought Joint Information Center (JIC) website:

www.droughtJIC.org

APPENDIX G

Drought Guidance Water Advisory Group (WAG) Members

Environmental Protection Division(EPD)

Brad Addison, Water Quality Program Manager
Charles Williams, Water Quality Program Manager
Amy Rammo, Water Quality, Environmental Specialist

Georgia Division of Public Health (DPH)

Betsy Kagey, Environmental Epidemiologist (WAG Chair)
Dana Cole, Medical Epidemiologist
Scott Uhlich, Environmental Health
Julia McPeck, Environmental Health
Kevin Caspary, Emergency Preparedness
Katherine Tuggle, Interim Health Community Preparation Director
Belen Moran, Public Information

Georgia Department of Agriculture (GDA)

Van Harris, Agricultural Manager

Environmental Protection Agency(EPA), Region 4

David Apanian, Emergency Preparedness