



NEHA BIA Webinar Series Presents:

# Boil Water What?!? When Good Water Goes Bad

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NEHA Business & Industry Affiliate  
[www.nehabia.org](http://www.nehabia.org)



# NEHA Business & Industry Affiliate

- The goal of NEHA BIA is to maintain and improve the standards of performance in environmental health by fostering and encouraging a mutual exchange of knowledge and experiences; education, research, and the dissemination of information between practitioners in the profession and allied businesses and industries. Members of the BIA aspire to help advance the state of the environmental health profession, and through it, improve the health of our communities.

# **Boil Water Notices in the U.S., 2012-2014**

**Kimberly Redden, MPH  
Foundation Relations & Research Manager**

A dynamic splash of clear blue water with many bubbles, moving from left to right across the bottom half of the slide.

**WQRF** | Water Quality  
Research Foundation

# Water Quality Research Foundation

- The Water Quality Research Foundation (WQRF) was formed in 1949 to serve on behalf of the Water Quality Association (WQA) as a universally recognized, independent research organization.
- The long-term goal of WQRF is to conduct and fund scientific research on subjects relating to the water quality improvement industry.
- Research agenda: final barrier, emerging contaminants, sustainability, regulatory and international affairs, and public awareness



# What We'll Cover

- Background
- Purpose of study
- Study findings
- Key takeaways
- Resources
- Q&A





# Relevancy to EH Professionals

- **Community Water System (CWS):** A public water system that supplies water to the same population year-round.
- **Non-Transient Non-Community Water System (NTNCWS):** A public water system that regularly supplies water to at least 25 of the same people at least six months per year.
  - Examples: **schools, daycares**, office buildings, and hospitals which have their own water systems.
- **Transient Non-Community Water System (TNCWS):** A public water system that provides water in a place where people do not remain for long periods of time.
  - Examples: gas station, **campground, restaurants**

# Safe Drinking Water Act

Contaminant	MCLG	MCL	Health effects	Source
<a href="#">Cryptosporidium</a>	zero	TT <sup>3</sup>	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste
<a href="#">Giardia lamblia</a>	zero	TT <sup>3</sup>	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste
<a href="#">Heterotrophic plate count (HPC)</a>	n/a	TT <sup>3</sup>	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment
<a href="#">Legionella</a>	zero	TT <sup>3</sup>	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems
<a href="#">Total Coliforms (including fecal coliform and E. Coli)</a> • <a href="#">Quick reference guide</a>	zero	5.0% <sup>4</sup>	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present <sup>5</sup>	Coliforms are naturally present in the environment; as well as feces; fecal coliforms and <i>E. coli</i> only come from human and animal fecal waste.
<a href="#">Turbidity</a>	n/a	TT <sup>3</sup>	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (such as whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff
<a href="#">Viruses (enteric)</a>	zero	TT <sup>3</sup>	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste

Source: US EPA, 2017



# Total Coliform & *E. coli*

- Total coliforms
  - Indicator organisms are used to determine presence of absence of a group of pathogenic bacteria
  - Method is quick, accurate and cost-effective
- *E. coli*
  - Fecal coliforms, such as *E. coli*, grow inside animal and human bodies





# Total Coliform Rule

- A PWS will receive an MCL violation when there is any combination of an *E. coli* positive (EC+) sample result with a routine/repeat Total Coliform (TC+) or EC+ sample result:

<b><i>E. coli</i> MCL Violation Occurs with the Following Sample Result Combination</b>	
<b>Routine</b>	<b>Repeat</b>
<b>EC+</b>	<b>TC+</b>
<b>EC+</b>	<b>Any missing sample</b>
<b>EC+</b>	<b>EC+</b>
<b>TC+</b>	<b>EC+</b>
<b>TC+</b>	<b>TC+ (but no <i>E. coli</i> analysis)</b>



**Public  
Notification**

Source: U.S. EPA, 2013



# Background

- A **boil water notice (BWN)** is given by health authorities or water utilities instructing consumers to boil water (and then cool) before using it for cooking, drinking, or any consumption.
  - Boil water “**advisory**” or “**notice**” are terms used interchangeably
  - “Boil water **order**” is the directive from the health dept. to the water utility requiring public notification
- “**Do not drink**”/ “**do not use**”
  - Non-microbiological contaminants, such as inorganics or other contaminants where boiling could actually concentrate them.





# WQRF BWN Study Purpose

- Comprehensive database of Boil Water Notices (BWN) and Do Not Drink/Use using state primacy agency reports and a validated news media search method
- Can news media be a good source of data collection?
  - Yes; validated “boil water”, “limited use of water”, and “do not drink water” were terms most successful in news media searches
- Analysis of the **frequency**, **cause**, and **location** of the BWN’s

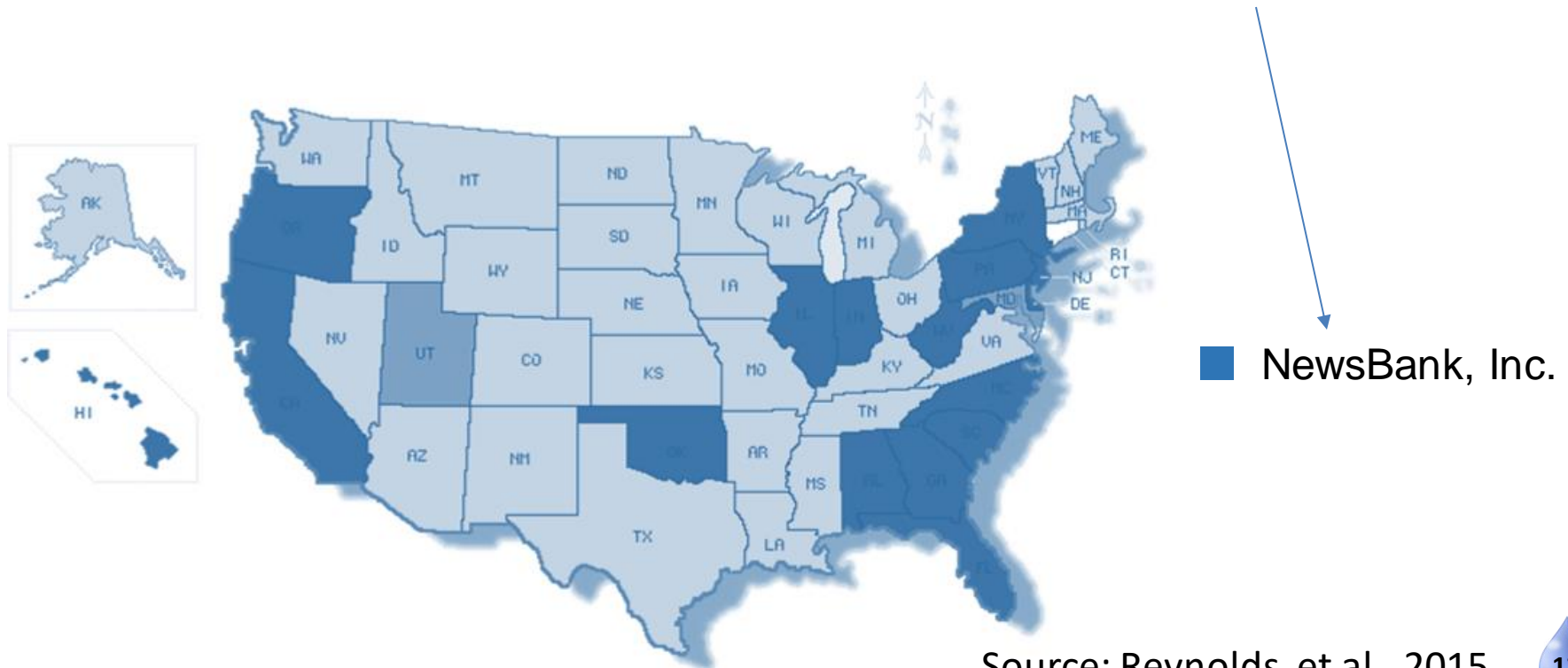
**When?**

**Why?**

**Where?**

# Findings

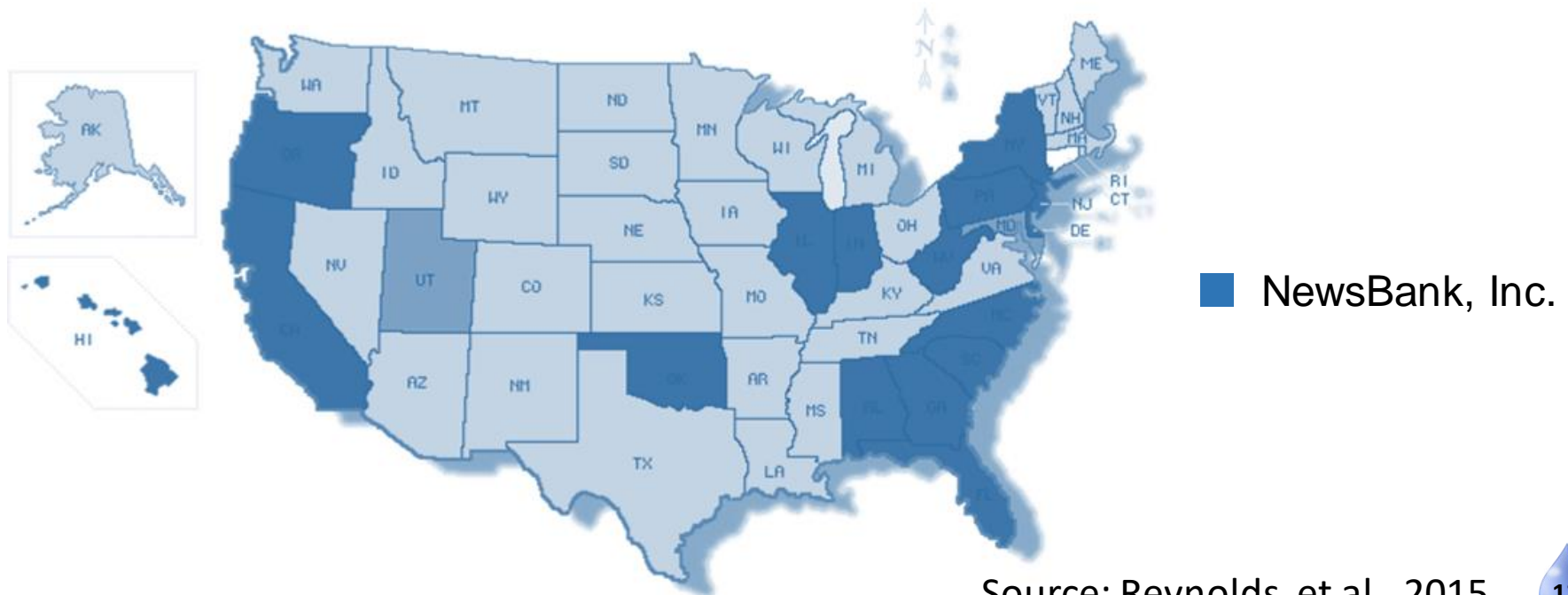
- **20,978** boil water notices from 2012-2014
- 33 state agencies provided data
- 17 states collected through news media search



Source: Reynolds, et al., 2015

# Findings

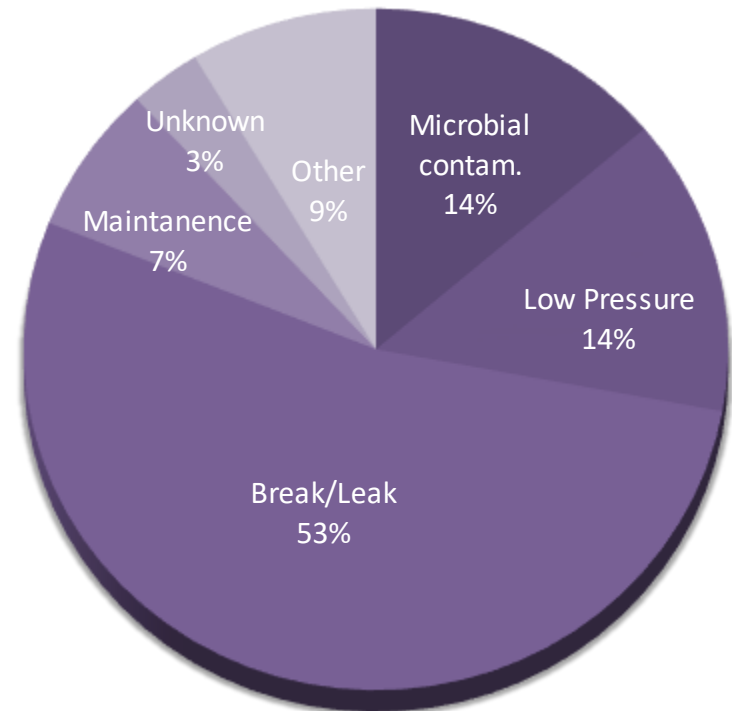
- **20,978** boil water notices from 2012-2014
- 99.5% were boil water notices
- 0.5% were do not drink notices



Source: Reynolds, et al., 2015

# Findings: Causes

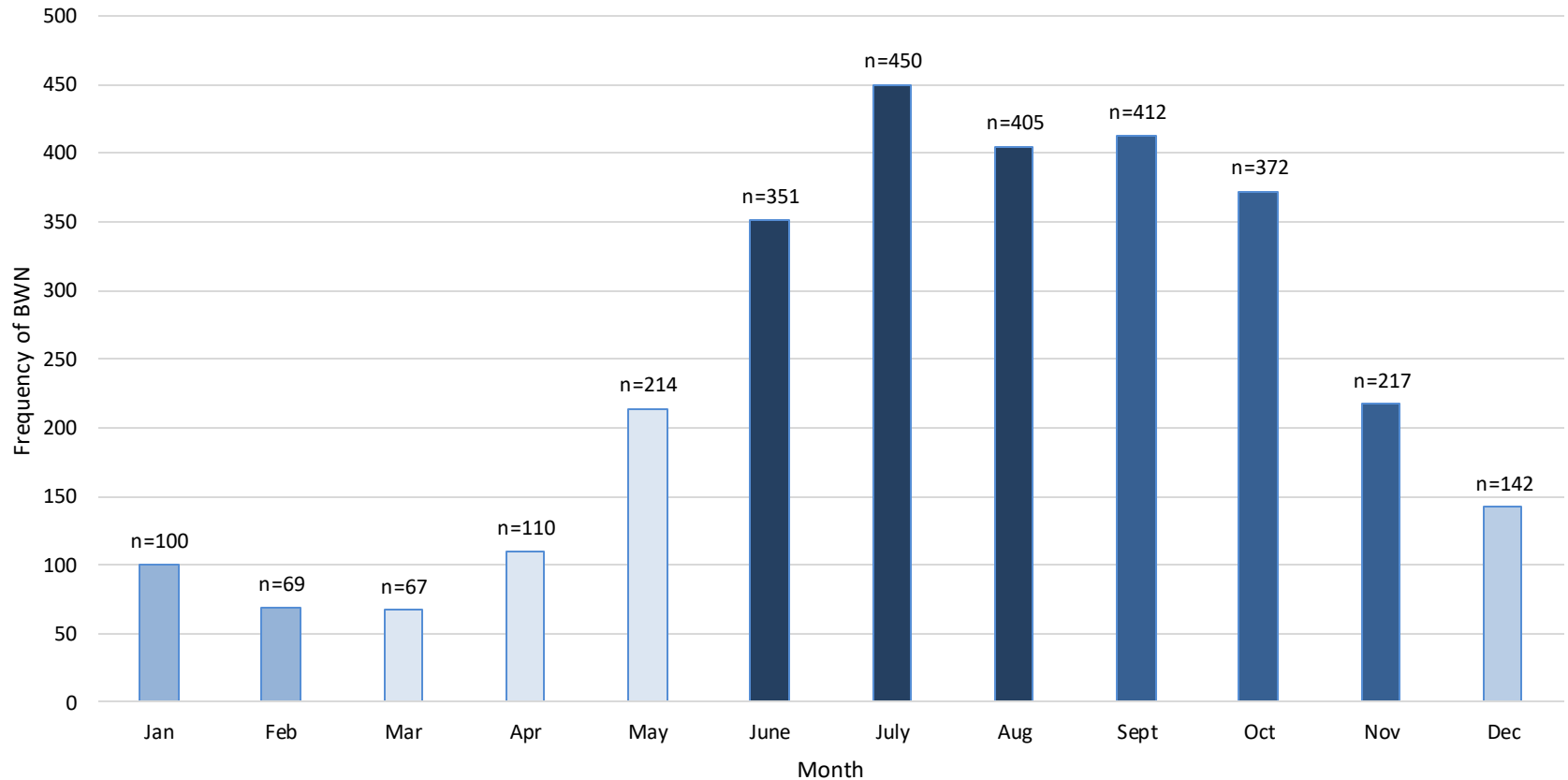
- 53% due to a water main break or leak (**precautionary**)
- 14% low pressure events (**precautionary**)
- **14% microbial contamination**
- 7% scheduled maintenance (**precautionary**)
- 12% Unknown/Other\*



\*Other includes: disinfection issues, mechanical issues, power loss, storms/natural disasters, water outage, inorganic contaminants, non-system water, turbidity, groundwater under the direct influence of surface water issues

# Findings: Seasonal Trends

Seasonal Trends in Confirmed **Microbial** Causes of BWN's from 2012-2014







# Results: Limitations

- Clear reporting differences state by state
  - Kentucky: **7,375**
  - Tennessee: **6**
  - Missouri: **1,916**
  - Kansas: **113**
  - **There is a need to standardize the approach to document boil water notices**
- Potential interpretation bias

# Future Work

- Correlation with system size, location, economic stability, per capita use
- Correlation with specific extreme weather events, infrastructure age, etc.



# Conclusion

- Database compiling boil water and do not drink notices from 2012-2014 was developed
- 20,944 boil water notices in 3 years
- Most notices are **precautionary** because there is a **potential** for microbiological contamination from a water main break / leak
- A **seasonal trend** for *E. coli* + was observed





# Key Takeaways

- Household water treatment equipment, such as softeners, backwashing filters, etc. should be cleaned and sanitized or disinfected after a BWN is lifted per manufacturer's instructions
- There is a time delay from when the event occurs and the time it takes to issue a BWN
- Drinking water treatment products certified for microbial reduction



# Treatment Technologies at POU/POE

- Point-of-use (POU) or point-of-entry (POE) treatment options:
  - Chlorine, chlorine dioxide, chloramines
  - Ultraviolet light
  - Ozone
  - Reverse Osmosis (RO) / Ultrafiltration (UF) membranes
  - Metals (silver or copper) - usually impregnated on another type of media
  - Distillation – appropriate for limited volumes of water
- After a BWN event, some treatment technologies may require disinfection/sanitization (i.e. RO, UF, and other medias)



# 3<sup>rd</sup> Party Certified Products

- BWN situations specifically involving microbiological contamination can be adequately handled by home drinking water treatment products **certified** for microbiological reduction.
- Certification standards covering microbiologicals (cyst, bacteria, virus):
  - NSF/ANSI 53 – Filtration
  - NSF/ANSI 58 – RO
  - NSF/ANSI 55 (Class A) – UV
  - NSF Protocol P231 – microbiological water purifiers
  - **USEPA Purifier Guide Standard\***
  - WQA ORD0901

\*USEPA Purifier Guide intended to validate treatment of unknown water quality

# EPA Purifier Guide Standard Test Water





# ANSI-Accredited Certification Bodies

- To find products certified for microbial reduction claims (bacteria, cyst, virus), visit an ANSI-accredited certification body's website, such as:
  - WQA Gold Seal ([www.wqa.org/Find-Products](http://www.wqa.org/Find-Products))
  - CSA Group ([www.csagroup.org](http://www.csagroup.org))
  - NSF International (<http://info.nsf.org/Certified/DWTU/>)
  - IAPMO ([www.iapmo.org](http://www.iapmo.org))
  - UL ([www.ul.com](http://www.ul.com))



# Acknowledgements

- Dr. Kelly A. Reynolds is a Professor at the University of Arizona College of Public Health. She holds a Master of Science Degree in public health (MSPH) from the University of South Florida and a Doctorate in Environmental Science from the University of Arizona.
- Reynolds, KA. 2015. *Boil Water Notices in the U.S., 2012-2014*. Report to the WQA BWN Study Task Force.
- Peer reviewers: WQA BWN Study Task Force, ASDWA, WQA Technical Affairs



Thank You!

# Resources

- Centers for Disease Control and Prevention (CDC) BWN Toolbox
- World Health Organization
- Study Executive Summary ([www.wqrf.org/](http://www.wqrf.org/))

**Fact Sheet About What to Do During a Boil Water Advisory**

**Boiling water**

**To boil water**

- Fill a pot with water.
- Heat the water until bubbles come from the bottom of the pot to the top.
- Once the water reaches a rolling boil, let it boil for 1 minute.
- Turn off the heat source and let the water cool.
- Pour the water into a clean container with a cover for storage.

**Disinfecting water**

If you are unable to boil your water, disinfect it instead.

**If tap water is clear:**

- Use unscented bleach (bleach that does not have an added scent).
- Add 1/8 teaspoon (8 drops or about 0.75 milliliters) of unscented household liquid bleach to 1 gallon (16 cups) of water.
- Mix well.
- Store in a clean container.

**If tap water is cloudy:**

- Filter through a clean cloth.
- Use a water filter.
- Add 1/8 teaspoon of unscented household liquid bleach to 1 gallon of water.
- Mix well.
- Store in a clean container.

**Remember to:**

- Boil water for 1 minute.
- Turn off the heat source and let the water cool.
- Pour the water into a clean container with a cover for storage.

**To sanitize:**

- Use a water filter.
- Make ice with boiled water.
- Pour the water into a clean container with a cover for storage.

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An Independent Research Foundation of WQA

**Executive Summary**

## Boil Water Notices in the U.S., 2012-2014

www.wqrf.org/about-us/research-foundation

WHO/EWC/WSH/15.02

**TECHNICAL BRIEF**

## BOIL WATER

**Introduction**

There are a number of circumstances in which it may be necessary to treat water at the point of use to remove or inactivate microbial pathogens. These include:

- failure of control measures, including lack of or improper disinfection and unsafe handling and storage;
- emergencies and disasters leading to inadequate sanitation, hygiene and protection of water sources; and
- uncertain quality of water sources when travelling.

A number of proven water treatment methods exist for the removal or inactivation of microbial pathogens, including chemical disinfection, filtration, flocculation/disinfection and heat. Boiling is one heat method. It is highly efficacious, killing human pathogens even in turbid water and at high altitude. However, boiling involves the high-cost use of carbon-based fuel sources and does not provide any residual protection.

**Scientific basis for the efficacy of boiling**

Enteric bacteria, protozoa and viruses in liquids are sensitive to inactivation at temperatures below 100 °C. Thermal inactivation has been examined in water, sewage, milk and other liquids at temperatures close to those used for pasteurization (e.g. 63 °C for 30 minutes, 72 °C for 15 seconds) and in hot water (about 60 °C). Only a few studies have examined thermal inactivation in liquids at temperatures approaching 100 °C.

Results of these investigations, which are summarized in Table 1, show that bacteria are particularly sensitive to heat, and rapid (i.e. less than 1 minute per log (90%) reduction) are achieved at temperatures above 65 °C. Viruses are inactivated at temperatures between 60 °C and 65 °C, but more slowly than bacteria. However, as shown for poliovirus and hepatitis A, as temperatures increase (i.e. 70 °C, a greater than 5 log inactivation (99.999% reduction) is achieved in less than 1 minute. *Cytophosphorus parvum* oocysts inactivated in less than 1 minute once temperatures exceed 70 °C. The data for *Giardia* cysts are more limited, but inactivation temperatures ranging from 50 °C to 70 °C has been reported.

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## BOIL WATER NOTICE TOOLKIT

**What is a Boil Water Notice (BWN)?**

There are 153,530 public water systems (PWS) in the U.S. supplying drinking water to customers every day.<sup>1</sup> A boil water notice (BWN), also referred to as a boil water advisory, is issued by a PWS when there is a known or suspected microbial contaminant in the drinking water distribution system. The microbes could be viral, bacterial, or protozoan, any of which can cause severe health issues. The notice will instruct consumers to boil all water used for drinking, cooking, food preparation, brushing teeth, and making ice. Proper treatment will make it safe to consume. Bathing or showering is typically fine as long as no water is accidentally consumed. The most sensitive populations to microbial contaminants include children, the elderly, and those with compromised immune systems.<sup>2</sup> Pets may also be at risk.

A BWN notice may be in response to a known event or is a precautionary measure to protect the public in case microbial contaminants are present. BWN's are the most common.

A "do not drink" or "do not use" notice may indicate chemical contamination and advises consumers to find alternative drinking water sources because boiling will not make the water safe for these specific contaminants. This type of notice advises consumers to avoid all contact with the water.<sup>3</sup>

**Why do they occur?**

0.5% are "do not drink" notices, and a very small number of other events were reported as "do not use" notices.<sup>2</sup>

The majority of notices (53%; 11,131) were presumed precautionary for suspected microbial contaminants due to leaks or breaks in a pipe or water main. The second largest category of boil water notices were also presumed precautionary because of low pressure events (14%; 2,959). A low pressure event is when the water pressure falls below twenty pounds per square inch in any portion of the public supply's water distribution system. The third largest category was from confirmed microbial contaminants, which resulted in 2,909 notices or 14% of the total.

**Figure 1: Results of the BWN data collection and categorization by types**

Primary Reason for Boil Water Notices in the U.S. 2012-2014

Category	Number of BWN's	Percentage
Scheduled Maintenance*	61,479	40.0%
Other/Unspecified**	10,580	11.0%
Confirmed Microbial Contaminant	2,909	14.8%
Low Pressure*	2,959	14.1%
Break or Leak*	11,131	53.0%

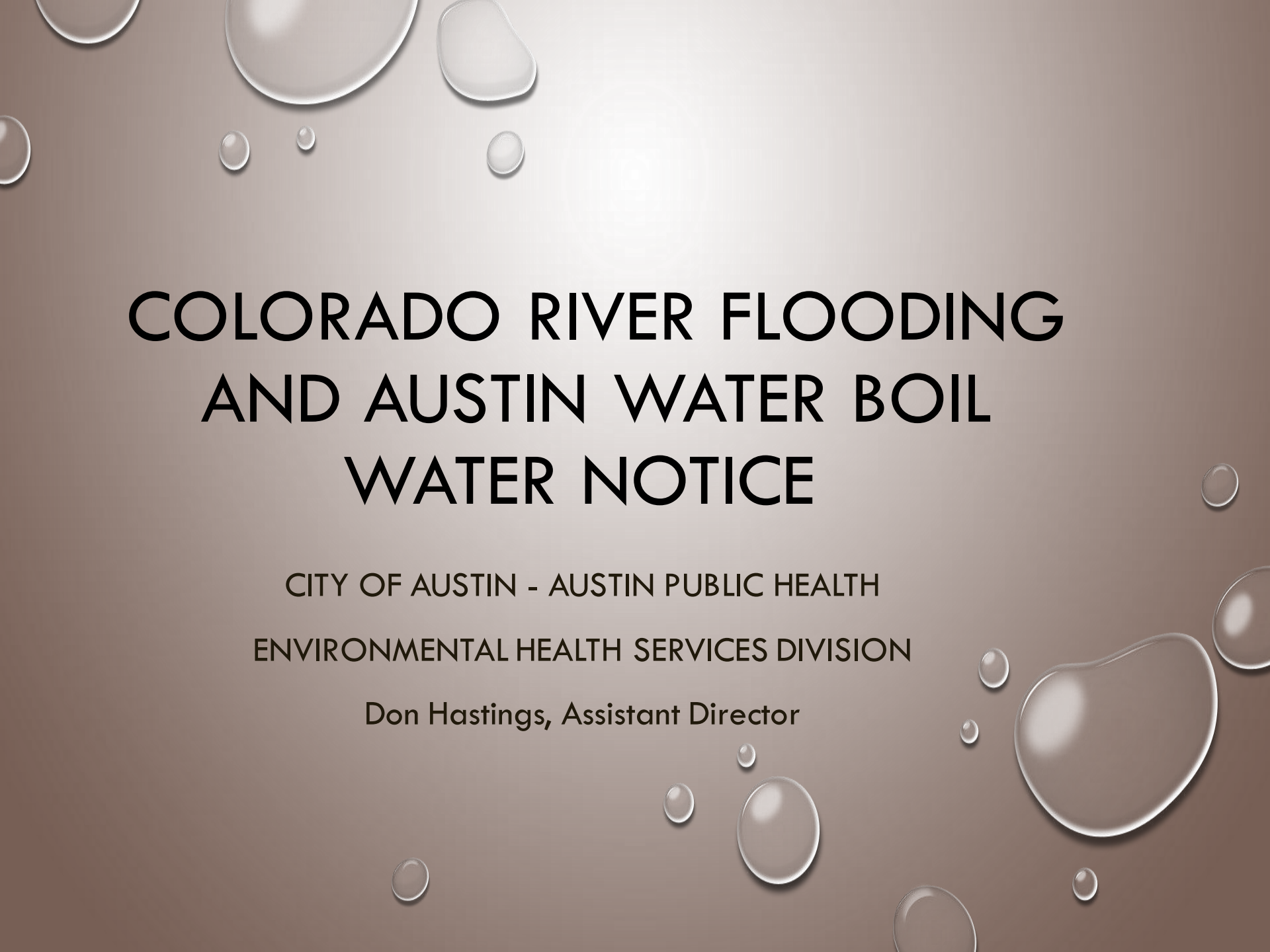
\*Necessary reason for the presence of public health risk associated through contamination.  
\*\*Includes categories: disinfection issues, mechanical issues, power loss, storm/hurricane disasters, water outage, nitrogen contamination, non-potable water, turbidity, groundwater under the direct influence of surface water issues, or unknown.

# Questions?



Kimberly Redden  
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630-929-2512

Thank you,  
NEHA!

The background is a solid brown color with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text is centered on the page.

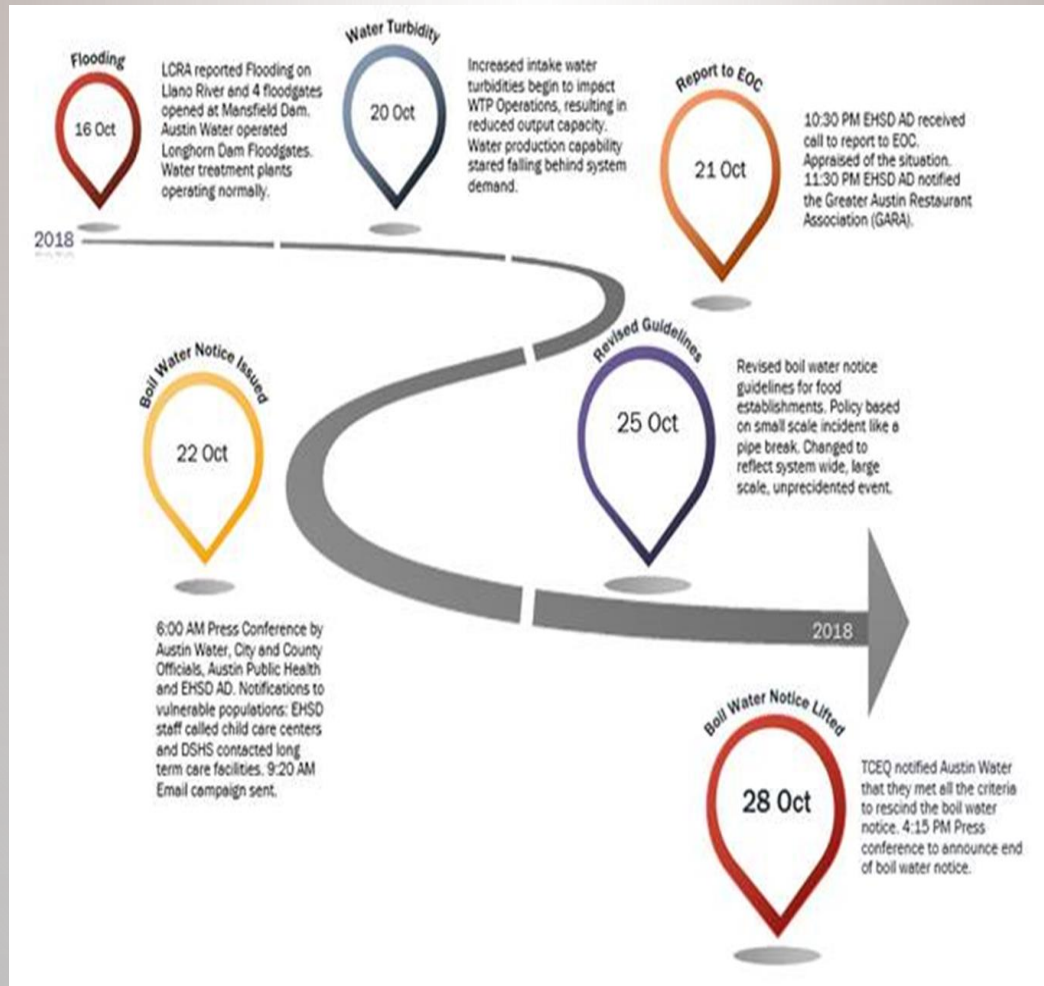
# COLORADO RIVER FLOODING AND AUSTIN WATER BOIL WATER NOTICE

CITY OF AUSTIN - AUSTIN PUBLIC HEALTH  
ENVIRONMENTAL HEALTH SERVICES DIVISION

Don Hastings, Assistant Director



# TIMELINE



# FLOODING OF THE COLORADO RIVER

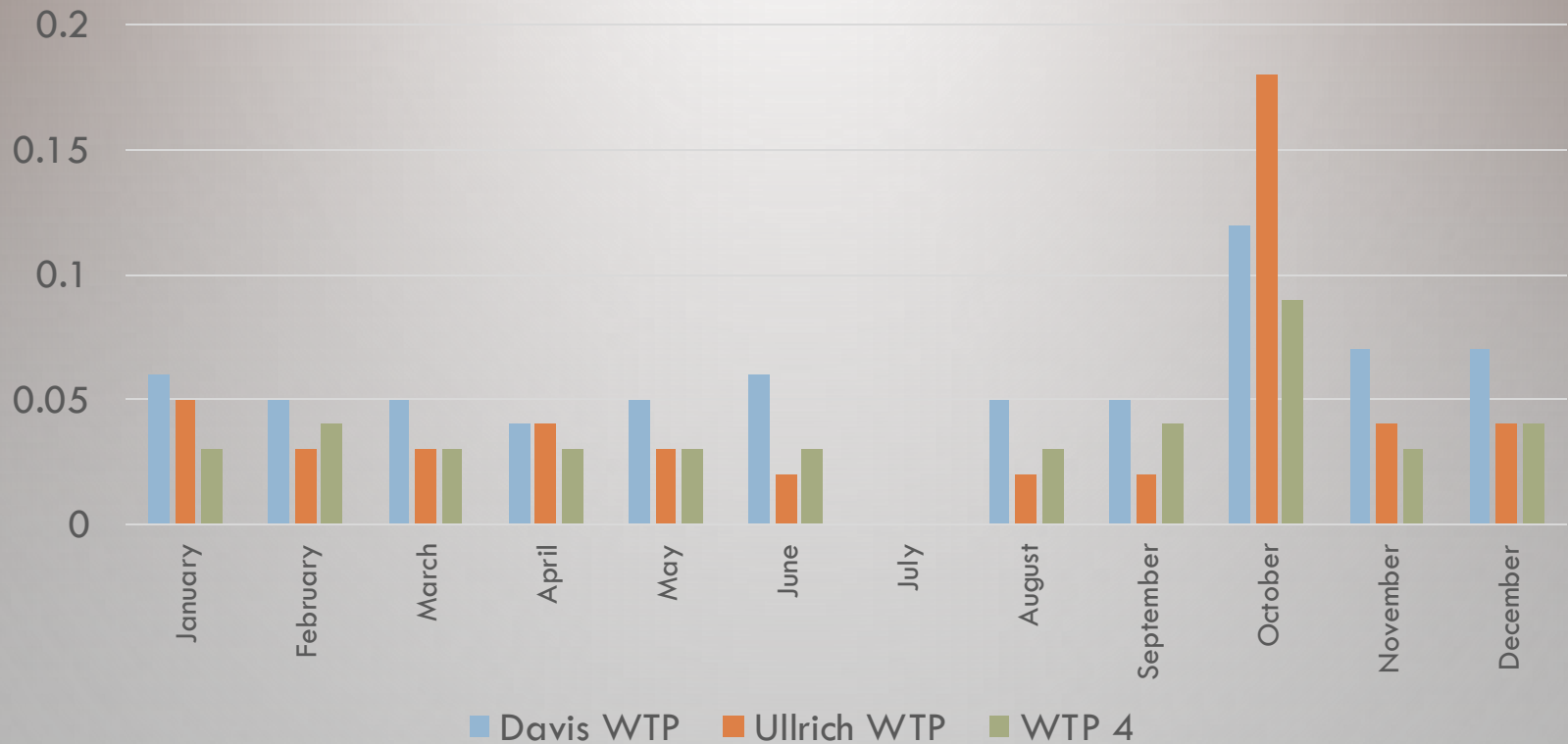
- Beginning in mid-October, successive and intense storm systems in the Central Texas region drove flooding of the Colorado River watershed to historic levels.
- Record high levels of debris, silt and mud require frequent backwashing of filters, significantly slowing the treatment process.
- In spite of a slower treatment process, Austin's four water treatment plants needed to continue producing as much potable water as possible:
  - To maintain the minimum water pressure needed for fire protection;
  - To avoid water line infiltration.



# FLOODING OF THE COLORADO RIVER

- The result of this sustained rate of treating highly-silted waters was the production of potable water with a high turbidity factor.
- Because highly turbid water is more likely to test positive for pathogens such as bacteria, viruses and protozoa, the City of Austin issued a **system-wide water boil alert**.
- Due to worsening flood conditions, Austin water customers were advised that the water boil alert could last for one to two weeks, or perhaps longer.

# AVERAGE TURBIDITY BY WATER TREATMENT PLANT AND MONTH FOR 2018



# EMERGENCY OPERATIONS CENTER

## **SUNDAY 10/21/18**

- For the first time in Austin's 100+ year recorded history of water operations, City leadership began planning a system-wide water boil alert.
- Key staff notified at 10:30 pm to report to the EOC
- APH staff notified the Greater Austin Restaurant Association (GARA) at 11:30 pm that night, and maintained contact several times a day throughout the event.
- First press conference held at 6:30 am Monday 10/22 to announce water boil alert: To ensure that water is safe, all Austin water customers are asked to boil water used for drinking, cooking, ice making or medical purposes.
- Customers were advised that this alert would last multiple days, and perhaps 1 -2 weeks or longer

# BOIL WATER ALERT

## FOOD PREPARATION:

**REQUIRED:** Effective immediately, all water used for food preparation, cooking, beverages, and ice must be from **approved sources** of water:

- Commercially bottled water.
- Water that has been heated to a rolling boil for three minutes.

# BOIL WATER ALERT

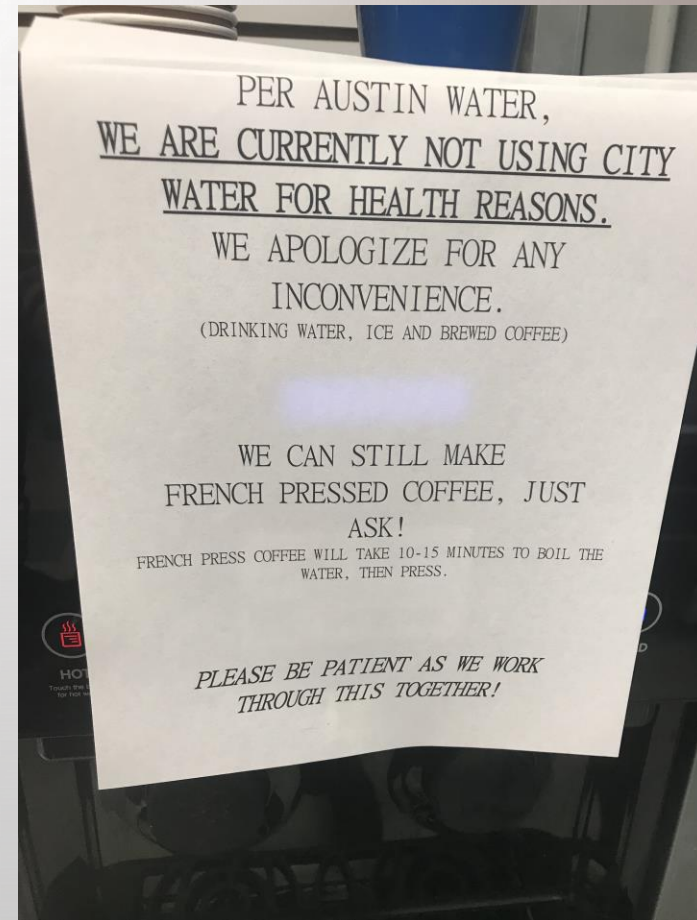
## THE DEBATE: HOW LONG TO BOIL WATER?

- Austin Water originally advised a rolling boil for three minutes.
- Austin Public Health originally advised a rolling boil for two minutes.
  - Centers for Disease Control: One minute
  - Texas Department of State Health Services: Two minutes
  - For consistency with Citywide Austin Water communications, Austin Public Health revised its advisory to three minutes on the second day of the event.



# STAKEHOLDERS: TO BE NOTIFIED

- Food Establishments
- Child Care Centers
- Congregate Living Centers
  - Long term care facilities
  - Boarding Homes
  - Group Homes
- Medical and Dental Offices



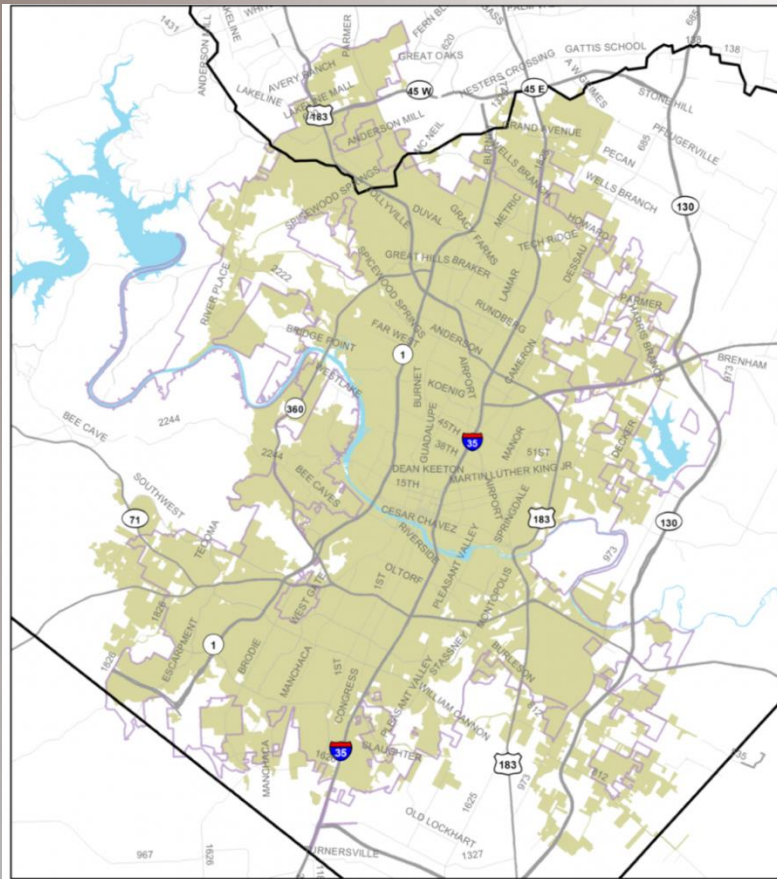
# STAKEHOLDERS: HOW TO REACH?

- Greater Austin Restaurant Association
- Austin Independent Business Alliance
- Constant Contact emails
- Austin 311 operators
- Media/Press Conferences
- Social Media
- City Council staff





# NO PATHOGENS DETECTED



Legend  
Travis County  
City of Austin Full Purpose Jurisdiction  
Receiving Water Treated by Austin Water



City of Austin  
Austin Water



Austin Water Service Area



This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. This product has been produced by the City of Austin for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.

Throughout the boil water notice event, continuous water testing yielded *no positive samples for pathogen infiltration.*

# AMENDING THE REQUIREMENTS

- Original boil water notice guidelines for food establishments were written based on a water line break and resulting service interruption—which is nearly always associated with pathogen contamination.
- Established CDC-based water boil protocols for food establishments were not geared to address a long term, system-wide turbidity-based water boil notice for which pathogen testing was consistently negative.
- After three days of the boil water notice, Austin Water was advising customers that the water boil alert may continue for another week or longer.

# AMENDING THE REQUIREMENTS

- Due to the burden posed by such long, indefinite water boil alert, APH decided to work with Austin food establishments to amend APH's boil water notice guidelines for food service.
- Accordingly, APH drafted revised, relaxed guidelines for ware washing and handwashing and held a press conference on Thursday 10/25 to inform stakeholders and the public.

# BOIL WATER ALERT

## **WAREWASHING:**

**PREFERRED:** Manual ware washing and sanitizing of utensils and equipment using only approved sources of water (bottled or boiled water).

**ACCEPTABLE:** Commercial dishwashers providing a hot water rinse (165°f - 180°f) or a chemical sanitizing cycle may be used. Machines must be properly maintained and operating as required by Texas Food Establishment Rules. Air dry all wares after sanitizing.



# BOIL WATER ALERT

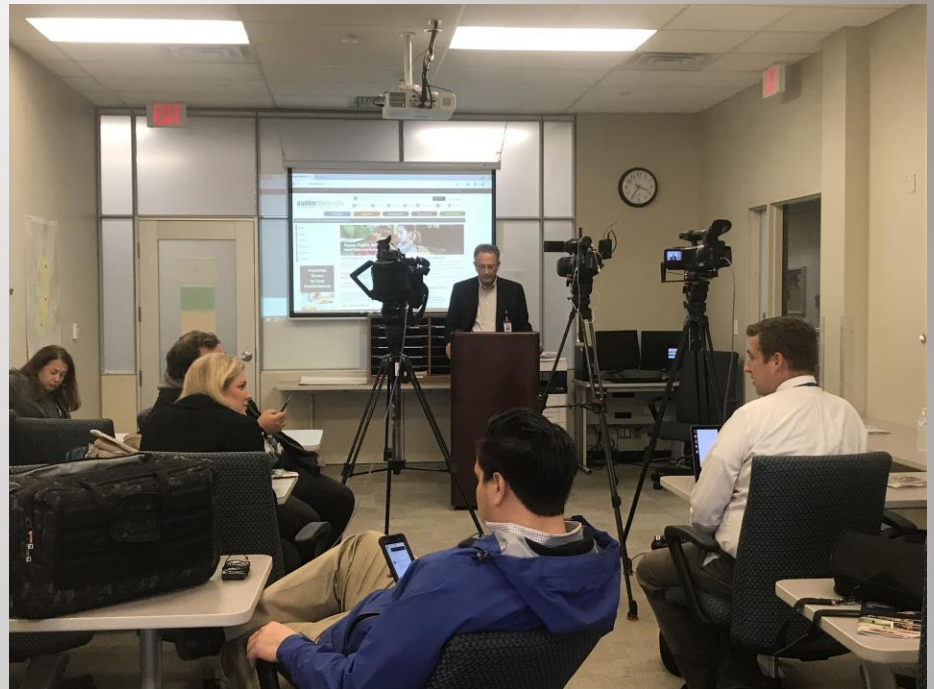
## HANDWASHING:

**PREFERRED:** Hand washing using only approved sources of water to be dispensed using a container with a spigot, followed by the donning of single use (disposable) gloves.

**ACCEPTABLE:** All food workers handling or preparing foods are required to wash hands (using existing tap water source) as required by the Texas Food Establishment Rules, then apply an alcohol based hand sanitizer, followed by the donning of single use (disposable) gloves. No bare hand contact with ready-to-eat foods will be allowed under this protocol.

# AUSTIN PUBLIC HEALTH MID-WEEK PRESS CONFERENCE

- Reconciled 2 minute advisory to food establishments vs. 3 minute advisory to residents.
- Explained relaxed requirements for ware washing and handwashing.
- Thanked restaurant community for cooperation to-date; asked consumers to be vigilant and ask questions.



# BOIL WATER NOTICE RESCINDED

- After being in effect one full week, Austin's water boil alert was rescinded on Sunday 10/28.
- No pathogens exceedances occurred throughout this event. Furthermore, syndromic surveillance was conducted throughout the event for hospital visits due to gastrointestinal illness. No spikes or increases in GI were observed.
- As a means to conserve water, and in the absence of positive microbial sampling, Austin Water did not advise customers to flush lines at the end of this event.
- Nonetheless, to provide a higher margin of safety for the public, APH advised restaurants to cycle two batches of ice and to flush water lines for three-five minutes prior to resuming use of tap water.

# TAKEAWAYS

- Don't wait for the media to ask the right questions at the right time: be proactive in getting out the word.
- To ensure effective communication, need to know who does what in your partner agencies, and how to contact them 24-7.
  - PIOs can do only so much...need decision makers and subject matter expertise.
- Need good communication tools with complete, up-to-date contacts database
  - APH uses Constant Contact with email addresses harvested from permit database; and, a frequently maintained website.



# TAKEAWAYS

- A close relationship with your stakeholders is invaluable: the Greater Austin Restaurant Association (GARA).
- Thanks in part to GARA's support and APH's extensive public information outreach, Austin's food establishment community cooperated throughout this event.
  - APH sanitarians received many questions and provided much guidance in the field, but no water boil violations were observed and no citations were issued during this event.
- Need protocols established in advance, addressing needed actions by all parties, not just Public/ Environmental Health.
  - Know your CDC and State Health Dept. guidelines and protocols.
  - Communicate adopted protocols to your industry groups—they will have valuable input
- Protocols cannot be one-size-fits-all. So be prepared to be flexible and use judgement, while keeping public health and safety as Priority #1.



**THANK YOU!**

**QUESTIONS?**

**CONTACT:**

[don.hastings@austintexas.gov](mailto:don.hastings@austintexas.gov)



# Boil Water Order Response

*Supporting on the ground and from Seattle*

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DATE

STARBUCKS®





# Austin Water Incident: October 2018

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“Lady Bird Lake in Downtown Austin, TX, has been described lately as chocolate milk because of the large quantities of silt floating in the water after a historic flood hit the city.”

Picture Source: Tanima/myclicks atx via Instagram

After unprecedented rain fall around the Austin market, the city’s water filtration became overwhelmed in processing the excess flood waters.

On the morning of October 22, the city notified the community the drinking water was no longer safe to consume without boil water actions. The city then pleaded with the community to reduce water use by 20% to avoid running out of water altogether.

**Over the course of the next nine days, we had 63 company operated and 17 licensed stores impacted in various stages.**

# The Roadmap: ensure food safety and quality are top of mind

## 1 Who was involved?

- Retail Quality Assurance/Food Safety
- CO Operations
- LS Operations
- Facilities
- Distribution
- Partner Resources
- Partner & Asset Protection
- Store Development
- Crisis Management
- Media Relations
- Legal

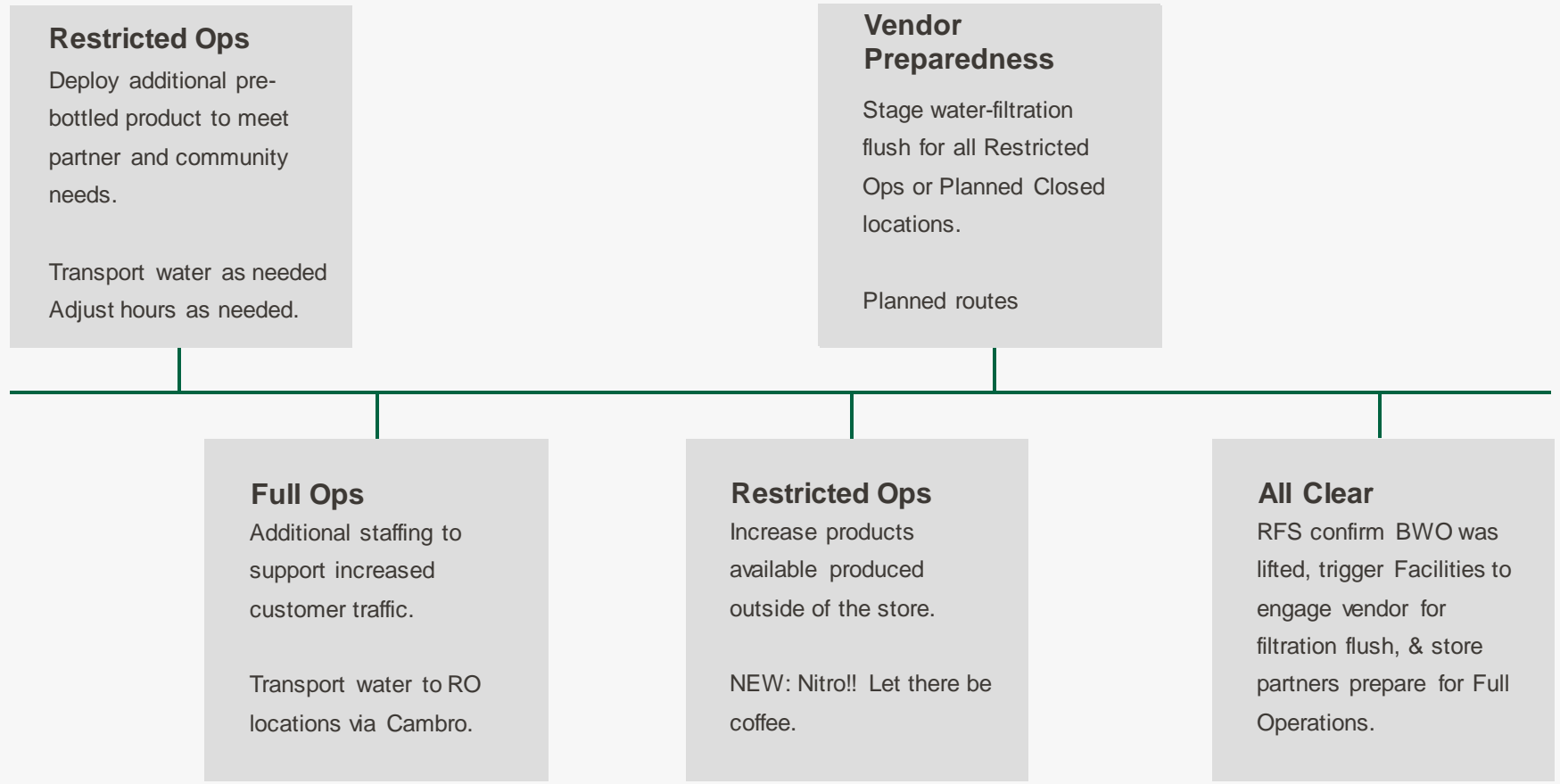
## 2 Scope

- In any water related incident, after the team is organized on roles and responsibilities, it is imperative to understand who is impacted.
- Key learnings from Hurricane Harvey: the ability to access records to identify each store's water source can be difficult depending on the contract. Much more easily navigated as we were supporting Austin.
- Based on water source, we were able to triage locations into the following categories;
  - **Full Operations**
  - **Restricted Operations**
  - **Planned Closed**

## 3 Process

- To eliminate drafts, we leveraged a SharePoint Excel document to track the on-going status of each individual location.
- We created a planned cadence of calls to align actions, address needs for store partners, stores, and the community. Frequency ranged from 5x day to 2 depending on demand.
- We established our non-negotiables;
  - What source will we use to clear stores and who owns that switch?
  - What must happen before we resume full operations?

# Path to All-Clear



# Creating a Water Emergency Response Plan

*The worst time to create an emergency plan is during the emergency.*

Current response to Boil Water or other water supply contamination incidents may be:

- Modify the operation of the store to only sell packaged food and bottled beverages.
- Supply the store with 5-gallon potable water bottles and pumps on brewing equipment. Requires bringing in bagged ice.
- Connect a potable water tank to the store. Potable water trucked in every other day.\*

Response is based on:

- Duration and the contaminant
- Local regulatory jurisdiction

\* Only used in a single extreme case so far.





## Support

*Enabling partners to meet our customers needs and leaders to make decisions.*

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Provide cross-functional support to stores and field leader to ensure successful execution of the Plan.

- **Operations** – Provides clear and concise communication to stores, and ensures partners have the necessary training and resources to succeed.
- **Facilities** – Dispatches technicians to connect water pumps and flush water lines/equipment. Also resets store to normal during recovery.
- **Sourcing** – Identifies suppliers for potable water and ice, negotiates pricing and delivery.
- **Finance** – Assist the field leaders making financial decisions. Weighing the cost of equipment and bottled water to keep a store open compared to the anticipated sales and duration of the boil water event.
- **QA/Food Safety** – Provide cleaning and handling instructions for water pumps during the response. Act as liaison with the local health departments, aligning on response guardrails and pivots to response plan. Approve potable water and ice suppliers.
- **Crisis Management** – For large scale crises, the Crisis Management team is activated to manage the incident and provide communication of the incident throughout the business.





# Monitor

*What's going to come at us next.*

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We try to anticipate when a boil water order might be coming. Some events that may cause biological contamination of a public water system:

- Water line breaks
- Treatment disruptions due to power outages
- Hurricanes, floods, and other disasters.

Non-biological contamination events:

- Cyanotoxin advisories
- Wildfire runoff

This is why we are in the process of developing an All-Hazards Water Emergency Response Plan.





# NEHA Business & Industry Affiliate

## Upcoming NEHA BIA Events

- Mid-Year Membership Meeting
  - When: March 21, 2019 from 1-2pm EST
  - +1(773)2319226,,1496152590#
- NEHA 2019 AEC
  - Exhibit Booth #625
  - Annual Membership Meeting – Thursday, July 11 from 4-5pm in the Belmont A conference room
  - Session – Community in Crisis – Operating within Your Emergency Operation Plan (time/day still TBD)

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Thank You!!

Questions?