

Addressing Drinking Water in Oregon:

A look at monitoring efforts for cyanotoxins, VOCs, & PFAS

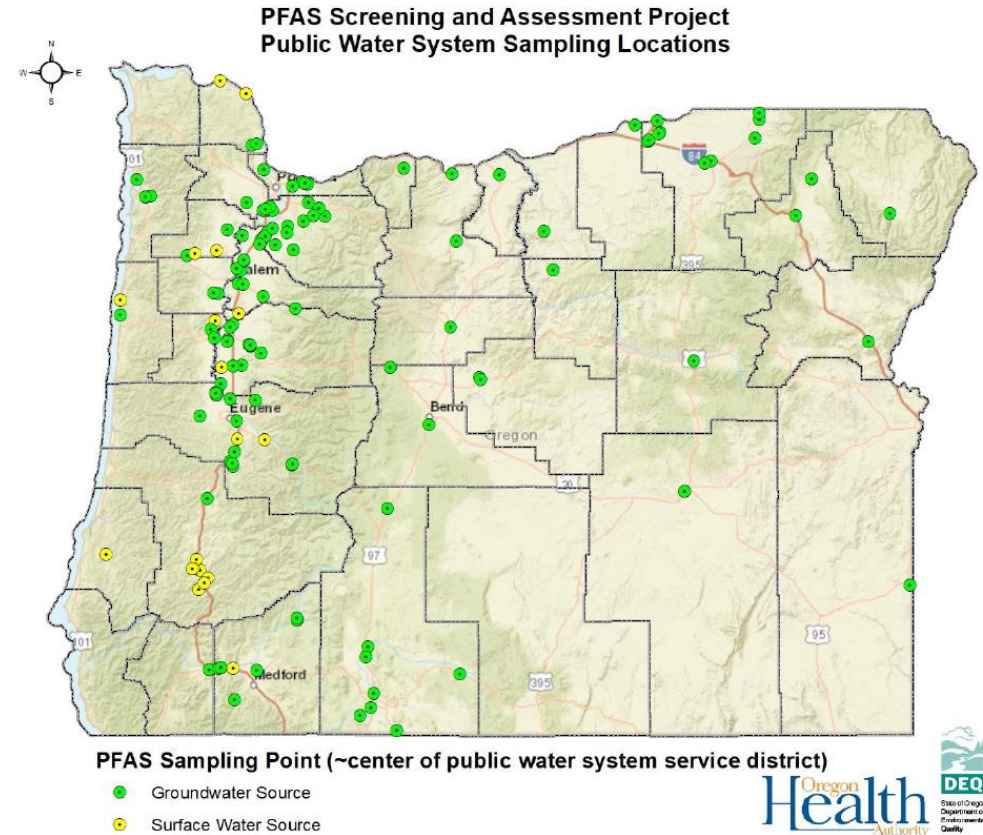
August 1, 2022

National Environmental Monitoring Conference

Crystal City, Virginia

Outline

- Three different studies
 - Introduction
 - Study Design & Sampling
 - Analysis & Results
 - Lesson Learned
 - Next Steps



Cyanotoxins...it all began in 2018...

May 29, 2018

City of Salem issues drinking water advisory



Late this afternoon, the city of Salem issued the following press release regarding a "Do Not Drink" notice for tap water in the cities of Salem, Turner, Suburban East Salem Water District, and Orchard Heights Water Association. The city is recommending that vulnerable people including infants, children under six, people with compromised immune systems, people receiving dialysis treatment, people with pre-existing liver conditions, pets, pregnant women or nursing mothers, or other sensitive populations should follow this advisory.

Everyone may use tap water for showering, bathing, washing hands, washing dishes, flushing toilets, cleaning and doing laundry.

Please see the full press release below for more information or visit cityofsalem.net.



DRINKING WATER ADVISORY

City of Salem: MAY 29, 2018,

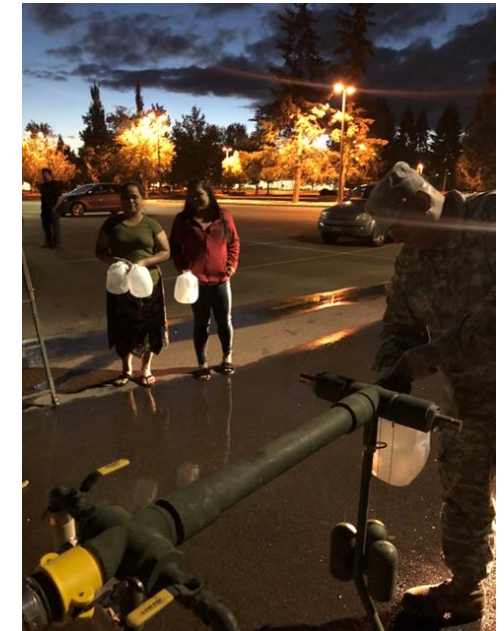
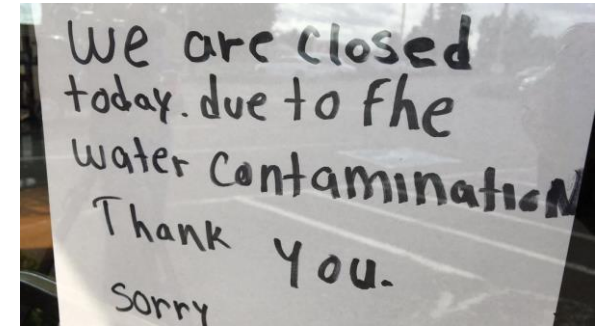
CYANOTOXINS PRESENT IN DRINKING WATER DO NOT DRINK THE TAP WATER -- INFANTS, YOUNG CHILDREN AND OTHER VULNERABLE INDIVIDUALS

Applies to City of Salem, City of Turner, Suburban East Salem Water District, and Orchard Heights Water Association

WHY IS THERE AN ADVISORY? Low levels of cylindrospermopsin and microcystin (cyanotoxins) have been found in treated drinking water. These toxins are created by algal blooms in the source of City of Salem drinking water, Detroit Reservoir.

To ensure the greatest quality of drinking water, City of Salem voluntarily samples for such toxins during algal events. Samples were collected on May 23, 2018, and May 25, 2018.

- May 29, 2018 – Harmful levels of cyanotoxins detected in City of Salem's water
- 33 day – DO NOT DRINK Advisory
- City, County and National Guard operated bulk water distribution
- Also affected
 - Hospitals, health care, dentists, schools, restaurants, day care, breweries
- RESULT – Rules requiring monitoring
 - Temporary – July 1, 2018
 - Permanent – January 28, 2019
 - OAR 333-061-0510



On-going Monitoring

Study Design

- Initially 100 facilities across Oregon
- On-going 55 facilities across Oregon
- Identified through risk assessment
 - Susceptible to HABS
- Two cyanotoxins required
 - Drinking Water Health Advisory Levels
 - Vulnerable population
 - Microcystin – 0.3 µg/L
 - Cylindrospermopsin – 0.7 µg/L
- On-going funding by State general fund
 - No cost to water systems

Sampling

- Samples collected by facilities
- Coordinated by DEQ project manager
- Training conducted each year for samplers
- > 700 samples collected each year
- May - October



DEQ Laboratory & Field staff

Analysis & Results

Analysis

- EPA Method 546
- EPA Method 545
(confirmation, if required)

Results

- 2021 – 42 detections
 - 4 facilities > HAL in source water
 - 0 facilities > HAL in finished water
 - Only microcystin



*Lake Billy Chinook, July 2020
Source: Oregon Health Authority*



*CASS Analyzer
Oregon DEQ Laboratory*

Lessons Learned

- COVID was hard
- Training is essential for small facilities
- Communication = most important!

Next Steps

- Continue with DW monitoring
- Increased funding = increase in recreational monitoring

Wildfires of 2020



Source: NOAA Satellites, 08 September 2020



Beachie Creek Fire damage, Santiam Canyon
Source: Office of Gov. Kate Brown

Summary of Event

- More than 1M acres burned
 - > 3% of forests in state
- 5 simultaneous “megafires”
- 21 fires total in 2020
 - 12 started on Labor Day
- 3000 structures burned
- 11 deaths

Water Systems

- 248 systems within fire boundaries, 37 systems with damage



Gates, Oregon Source: US Forest Service



*Lionshead Fire near Mt Jefferson
Source: US Forest Service*



Panther Creek WD, Treatment System

Panther Creek WD Source: OHA



Detroit Water System, Pumps

City of Detroit WS Source: OHA

VOC Monitoring

Study Design

- 16 small DW facilities
 - (< 3,300 population)
- ~ 600 samples collected
 - Points within the distribution system
- Funded by State emergency funding
- No cost to systems
- Based on California research
- Required sampling at burned service connections

After Wildfires Stop Burning, a Danger in the Drinking Water

Experts are warning that existing water safety rules are not suitable to a world where wildfires destroy more residential areas than in the past.



Water flows from a pipe amid the charred remains of a building in Gates, Oregon, in September. Kathryn Ellessier/Agence France-Presse — Getty Images

Source: New York Times, 10/02/2020

Sampling

- Community systems develop sampling plans
- Samples collected by facilities
- Coordinated by DEQ project manager
- Sampling method modified
 - Not compliance monitoring
 - Water to be held in pipes

VOC Analysis & Results

Analysis

- EPA Method 524.2

Results

- MCL exceedances
 - Benzene, chlorobenzene
 - Styrene
 - Methylene chloride (dichloromethane)
 - Vinyl chloride (trichloromethane)
 - Dichlorobromomethane
 - Chloroform



Sampling Kit

Lessons Learned

- Sampling was hard for facilities
- Many facilities completely destroyed
- Difficulty for planning
- Shipping / sample receipt issues.

Next Steps

- Early preparation for response
- Governor's Wildfire Science Team
 - Playbook for future, not just DW
- EPA Guidance, Sept 2021

PFAS Investigatory Sampling

- Study Objective – Evaluate potential exposure from PFAS to populations served by public water systems.
- Big Universe
 - More than 3,300 public water systems, serving 85% of Oregonians
 - Both surface & groundwater sources
- Tiered approach to selection – OHA / DEQ evaluation

Monitoring

Study Parameters

- 140 facilities
- ~ 155 total samples
- Funded by EPA grant
- No cost to systems
- Focus on small systems
 - Less than 10,000 population
 - Not sampled during UCMR3 or during another voluntary sampling
 - PWS & DW source are active



DW facility, Source: DEQ

Sampling

- Samples collected DEQ staff
- Concerns over “clean” sampling drove this
- DEQ developed sampling SOP
- No shipping involved
- Blanks collected at each site per method

Analysis & Results

Analysis

- EPA Method 533
- Brought online for this study

Results

- 5 compounds detected above MRLs
PFHpA, PFHxA, PFHxS, PFOA, PFOS
- No detections above Oregon HALs



PFAS extraction, Oregon DEQ Lab

Lessons Learned

- Sampling was successful
- SOP / guidelines worked!
- No blank contamination observed.

Next Steps

- Evaluate HALs based on EPAs impending MCLs
- Complete study in late July – August
- Consider other PFAS analysis methods
- UCMR5 – EPA 2023

Resources

- Cyanotoxin Monitoring – On-going
 - Oregon Administrative Rule - [OAR 333-061-0510](#)
- VOC sampling – Wildfire Response
 - Oregon Health Authority, [Post Wildfire Sampling](#)
 - [Data online](#)
 - EPA [guidance](#), Addressing Contamination of Drinking Water Distribution Systems from Volatile Organic Compounds (VOCs) After Wildfires
- PFAS Study
 - [PFAS Information](#) in Drinking Water, Oregon Health Authority
 - [PFAS Information](#), general, DEQ
 - [Data online](#)
- DEQ [Laboratory](#) information

Partners & Staff



All the
communities
of Oregon
who
participated in
one of these 3
efforts!

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