

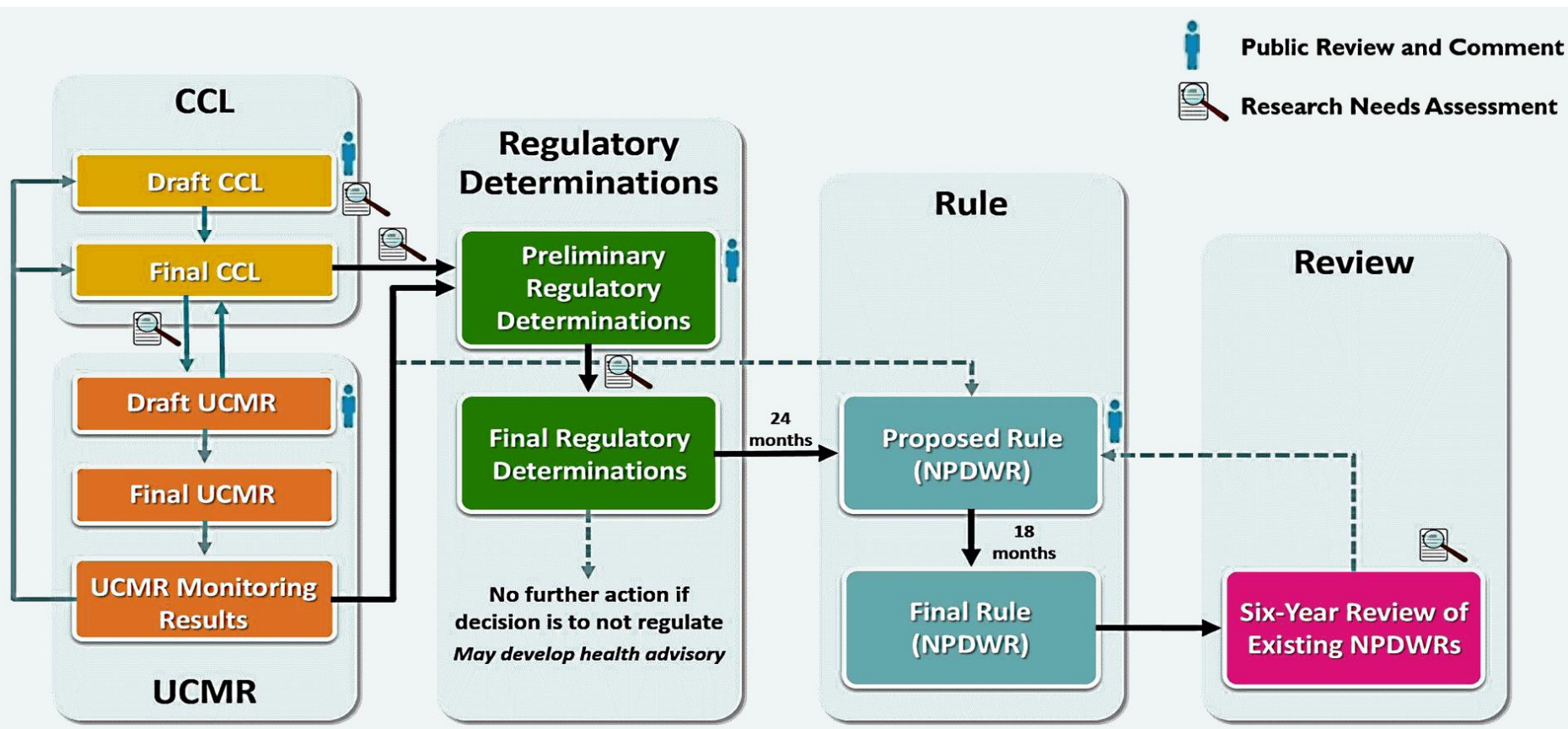
CWA Spring Conference 2019 • May 22 - 24 • The Sawyer Hotel

**FIRE AND WATER**  
SURVIVAL AND SUSTAINABILITY

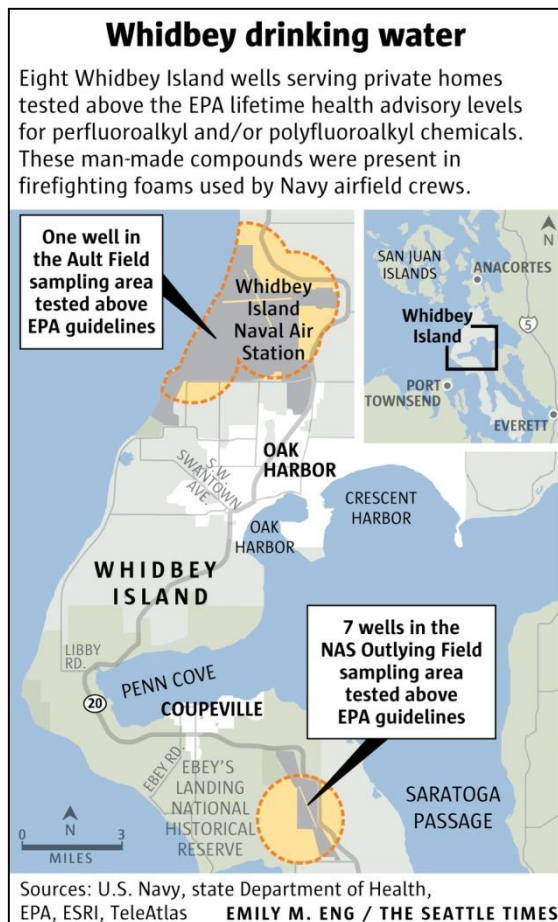
# WHEN LEGISLATION MEETS WATER QUALITY STANDARDS

May 23, 2019

# LEGISLATION & QUALITY STANDARDS



# REGULATION IN THE PUBLIC DOMAIN





# DDW PRIORITIES FOR 2019



## THEREFORE BE IT RESOLVED THAT:

1. The State Water Board approves DDW proposal not to re-examine any existing MCLs this year.
2. The State Water Board directs DDW to prioritize their work on drinking water regulation for calendar year 2019 as follows:
  1. Hexavalent Chromium MCL
    - a. Economic Feasibility Workshops
    - b. Maximum Contaminant Level
  2. Lead and Copper Rule (LCR)
    - a. Short-Term Revisions
    - b. Revised Lead Detection Limit for Purposes of Reporting (DLR)
    - c. Assistance to Department of Social Services for Daycare Regulations
    - d. Lead and Copper Rule Revision
  3. Revised Total Coliform Rule (RTCR)
  4. Direct Potable Re-use (DPR)
    - a. Research and Framework
    - b. Regulations
  5. Cross-Connection and Backflow Protection Control Regulations
    - a. Review of Existing Regulations
    - b. Policy Handbook
  6. Environmental Laboratory Accreditation Program (ELAP) Regulations
  7. Primacy Package Applications
    - a. Consumer Confidence Reports
    - b. Public Notification
  8. Revised Perchlorate DLR
  9. Microplastics
    - a. Definition
    - b. Testing and Reporting Regulations
  10. Water Quality Standards for On-site Treatment and Reuse
  11. Electronic Reporting of Drinking Water Quality Data
  12. Investigation of Per- and Polyfluoroalkyl Substances (PFAS)

# PFAS – NATIONAL OCCURRENCE

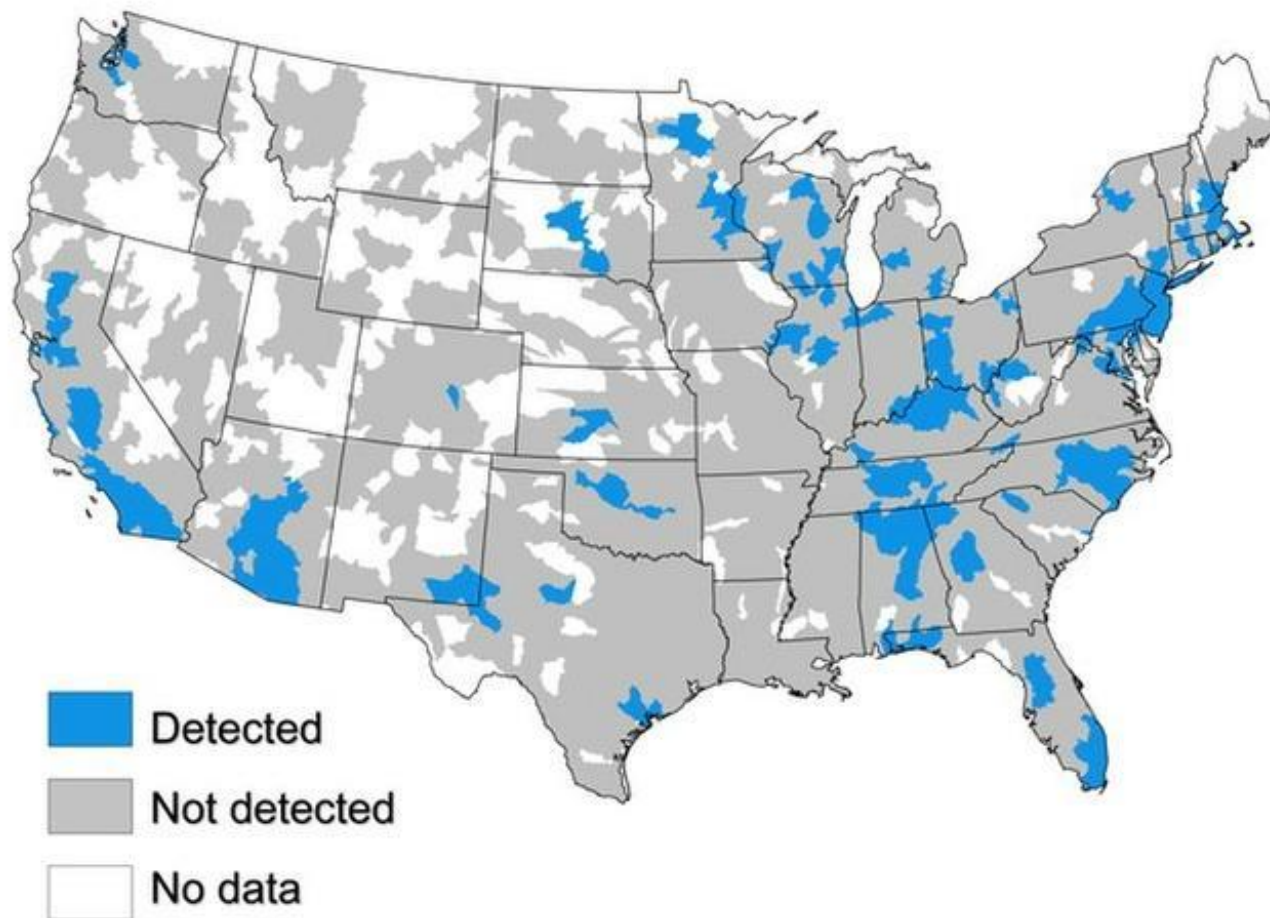
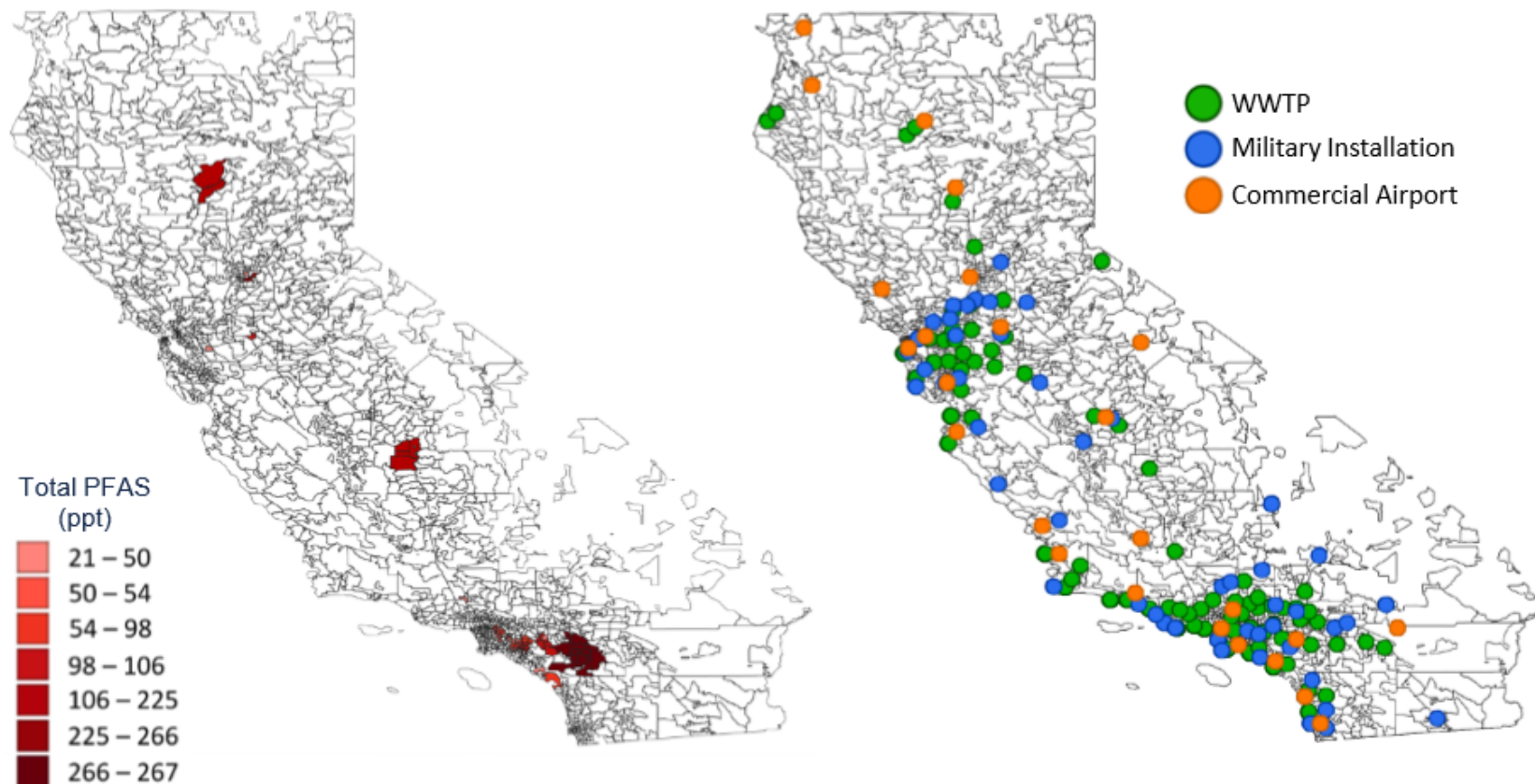


Image From: Hu XC et al., Environmental Science & Technology Letters, 2016

# PFAS – DOD OCCURRENCE



# PFAS – CALIFORNIA OCCURRENCE



<https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3>

Hu XC, et al., 2016. Detection of PFASs in US drinking water linked to industrial sites, military fire training areas, and waste water treatment plants. *Env Sci and Tech Letters* 3(10):344–350



# PFAS LEGISLATION



In response to EPA  
The California State  
Water Board acted on  
July 13, 2018

## Notification Levels

13 ng/L (PFOS)

14 ng/L (PFOA)

## Response Level

70 ngL (PFOS + PFOA)

### AB756

AB-756 Public water systems: perfluoroalkyl substances and polyfluoroalkyl substances. (2019-2020)

SHARE THIS: Date Published: 04/24/2019 09:00 PM  
AMENDED IN ASSEMBLY APRIL 24, 2019  
AMENDED IN ASSEMBLY MARCH 13, 2019

CALIFORNIA LEGISLATURE—2019-2020 REGULAR SESSION

**ASSEMBLY BILL** **No. 756**

Introduced by Assembly Member Cristina Garcia  
February 19, 2019

An act to ~~amend Section 116378 of, and to add Sections 116370 and 116370 to, add Section 116370 to~~ the Health and Safety Code, relating to drinking water.

LEGISLATIVE COUNSEL'S DIGEST

AB 756, as amended, Cristina Garcia. Public water systems: ~~contaminants~~ perfluoroalkyl substances and polyfluoroalkyl substances.

Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration programs relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting implementing regulations, and conducting studies and investigations to assess the quality of water in private domestic water supplies. Under the California Safe Drinking Water Act, the implementing regulations are required to include, but are not limited to, monitoring of contaminants and requirements for notifying the public of the quality of the water delivered to customers.

This bill would ~~require~~ authorize the state board to order a public water system to monitor for perfluoroalkyl substances and polyfluoroalkyl substances. ~~The bill would additionally require a public water system to publish and keep current on its internet website water quality information relating to regulated contaminants and to notify each customer in the customer's mail water bill and through email, as prescribed, of confirmed detections of specified water contaminants.~~

Vote: majority Appropriation: no Fiscal Committee: yes Local Program: no

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 116378 is added to the Health and Safety Code, to read:

### AB841

AB-841 Drinking water: contaminants: perfluoroalkyl and polyfluoroalkyl substances. (2019-2020)

SHARE THIS: Date Published: 03/20/2019 09:00 PM  
AMENDED IN ASSEMBLY MARCH 20, 2019

CALIFORNIA LEGISLATURE—2019-2020 REGULAR SESSION

**ASSEMBLY BILL** **No. 841**

Introduced by Assembly Member Ting  
February 20, 2019

An act to add Section 116365.3 to the Health and Safety Code, relating to drinking water.

LEGISLATIVE COUNSEL'S DIGEST

AB 841, as amended, Ting. Drinking water: contaminants: perfluoroalkyl and polyfluoroalkyl substances.

Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration programs relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting implementing regulations, and conducting studies and investigations to assess the quality of water in private domestic water supplies. The act requires the board to adopt primary drinking water standards for contaminants in drinking water and requires the Office of Environmental Health Hazard Assessment to prepare and publish an assessment of the risks to public health posed by each contaminant for which the board proposes a primary drinking water standard.

The act requires a public water system to provide prescribed notices within 30 days after it is first informed of a confirmed detection of a contaminant found in drinking water delivered by the public water system for human consumption that is in excess of a maximum contaminant level, a notification level, or a response level established by the state board.

This bill would require the office to adopt and complete a work plan within prescribed timeframe to assess which substances in the class of perfluoroalkyl and polyfluoroalkyl substances should be ~~tested as a~~ identified as a potential risk to human ~~health~~ health, as provided. The bill would require the office, as part of those assessments, to determine which of the substances are appropriate candidates for notification levels to be adopted by the state board. The bill would require the office, by January 1, 2022, to provide to the Legislature an update on the assessment. The bill would require the office to assess annually those substances as new information, scientific research, and detection methodologies become available.

Vote: majority Appropriation: no Fiscal Committee: yes Local Program: no





- 1. Water analysis requirements for systems subject to potential contamination due to prior analytical data (UCMR3) and/or proximity to adjacent sources that may be contaminated**
- 2. Specific sampling guidance**
- 3. Analytical method and reporting requirements**
- 4. Flexibility in verification of test results used for CCR, Notification Level and Response Level compliance**
- 5. Orders are legally enforceable and may be modified to protect public health**

# PFAS MONITORING IMPLEMENTATION



	PFAS Detect	Near PFAS Detect (1 mi)	Near Landfill (1mi)	Near Airport (2mi)	Near Airport (2mi) and Landfill (1mi)	Near PFAS Detect (1mi) and Airport (2mi)	PFAS Detect and Near Airport (2 mi) and Landfill (1mi)	Near PFAS Detect (1mi) and Airport (2mi) and Landfill (1mi)	Grand Total
Grand Total	99	161	138	215	32	10	3	2	660

WATER CODE SECTION 13267 ORDER FOR THE DETERMINATION OF THE PRESENCE OF PER- AND POLYFLUOROALKYL SUBSTANCES

ORDER WQ 2019-0006-DWQ

= 252 Municipal Landfills

WATER CODE SECTION 13267 ORDER FOR THE DETERMINATION OF THE PRESENCE OF PER- AND POLYFLUOROALKYL SUBSTANCES

ORDER WQ 2019-0005-DWQ

= 31 Airports

# PFAS ANALYTICAL METHODS



EPA Method 537 Rev 1.1* (14 PFAS analytes)		EPA Method 537.1* (18 PFAS analytes)	
Analyte	Detection Limit <sup>[1]</sup> (ng/L)	Analyte	Detection Limit <sup>[1]</sup> (ng/L)
PFBS	3.1	PFBS	1.8
PFHxA	1.6	PFHxA	1.0
PFHpA	0.5	PFHpA	0.71
PFHxS	2.0	PFHxS	1.4
<b>PFOA</b>	<b>1.7</b>	<b>PFOA</b>	<b>0.53</b>
<b>PFOS</b>	<b>1.4</b>	<b>PFOS</b>	<b>1.1</b>
PFNA	0.7	PFNA	0.7
PFDA	0.7	PFDA	1.6
NMeFOSAA	6.5	NMeFOSAA	2.4
PFUnA	2.8	PFUnA	1.6
NEtFOSAA	4.2	NEtFOSAA	2.8
PFDaA	1.1	PFDaA	1.2
PFTTrDA	2.2	PFTTrDA	0.72
PFTA	1.7	PFTA	1.1
		HFPO-DA	1.9
		ADONA	0.88
		9Cl-PF3ONS	1.4
		11Cl-PF3OUdS	1.5

\*in reagent water

TABLE 1. PFAS Analytes Subject to Analysis

Chemical Name	Abbreviation	Chemical Abstracts Service (CAS) No.
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid	HFPO-DA	13262-13-6*
10:2 Fluorotelomer sulfonic acid	10:2 FTS	120226-80-0*
2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy) propanoic Acid	HFPA-DA	13262-13-6 *
Perfluorooctadecanoic acid	PFOcDA	18517-11-8*
N-Ethyl perfluorooctane sulfonamidoethanol	EtFOSE	1891-99-2*
Perfluorooctane sulfonic acid	PFOS	1783-23-1
Perfluoroundecanoic acid	PFUnDA	2058-94-8
N-Methyl perfluorooctane sulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-Methyl perfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7*
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluoropentane sulfonic acid	PFPeS	2706-91-4
6:2 Fluorotelomer sulfonic acid	6:2 FTS	27619-97-2
N-Ethyl perfluorooctane sulfonamidoacetic acid	NEtFOSAA	2991-50-6
Perfluorohexanoic acid	PFHxA	307-24-4
1,0Perfluorododecanoic acid	PFDaA	307-55-1
N-Methyl perfluorooctane sulfonamide	MeFOSA	31506-32-8*
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorodecane sulfonic acid	PFDS	335-77-3
4,4,5,5,6,6,6-Heptafluorohexanoic Acid	3:3 FTCA	356-02-5*
Perfluorohexane sulfonic acid	PFHxS	355-46-4
Perfluorobutanoic acid	PFBA	375-22-4
Perfluorobutane sulfonic acid	PFBS	375-73-5
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluoroheptane sulfonic acid	PFHpS	375-92-8
Perfluorononanoic acid	PFNA	375-95-1
Perfluorotetradecanoic acid	PFTeDA	376-06-7
2H,2H,3H,3H-Perfluorodecanoic acid	7:3 FTCA	812-70-4*
8:2 Fluorotelomer sulfonic acid	8:2 FTS	39108-34-4
N-Ethyl perfluorooctane sulfonamide	EtFOSA	4151-50-2*
Perfluorononane sulfonic acid	PFNS	474511-07-4*
Perfluorohexadecanoic acid	PFHxDA	67905-19-5*
Perfluorotridecanoic acid	PFTTrDA	72629-94-8
Perfluorooctanesulfonamide	FOSA	754-91-6
4:2 Fluorotelomer sulfonic acid	4:2 FTS	757124-72-4
Perfluoro-2-((6-chlorohexyl)oxy)ethanesulfonic acid)	9Cl-PF3ONS	756426-58-1*
2-((8-Chloro-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-hexadecafluorooctyl)oxy)-1,1,2,2-tetrafluoroethanesulfonic acid	11Cl-PF3OUdS	763051-92-9*
2H,2H,3H,3H-Perfluorooctanoic Acid (CAS 914637-49-3)	5:3 FTCA	914637-49-3*
4,8-Dioxo-3H-perfluorononanoic acid	Adona	919005-14-4*

Note: Only the 23 analytes without the asterisk (\*) are required to be analyzed as part of this Order. The analytes with the asterisk (\*) are included in some but not all lists provided by accredited laboratories and are encouraged to be analyzed as part of this effort.

# MICROPLASTICS LEGISLATION



Year	Bill	Summary	Effective date	Impact
2014	SB 270	Single use plastic bag ban	July 1, 2015	Reduction of about 13 billion bags per year (CBS13 2017)
2015	AB 888	Ban on plastic microbeads	January 1, 2020	Inspired federal legislation to ban microbeads
2018	SB 1335	State owned facilities (and concessionaires) must use recyclable, reusable, or compostable food service packaging	January 1, 2021	Limited – state owned facilities only
2018	SB 1263	Statewide microplastics strategy	December 31, 2021	To be determined
2018	AB 1884	Plastic straws available only upon request at sit-down restaurants	January 1, 2019	Limited – not applicable at fast food restaurants
2018	SB 1422	Microplastics testing in drinking water	July 1, 2020	Will require drinking water utilities to test for microplastics for 4 years



# MICROPLASTICS LEGISLATION – SB1422



SB-1422 California Safe Drinking Water Act: microplastics. (2017-2018)

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Date Published: 09/28/2018 09:00 PM

## Senate Bill No. 1422

### CHAPTER 902

An act to add Section 116376 to the Health and Safety Code, relating to drinking water.

[ Approved by Governor September 28, 2018. Filed with Secretary of State September 28, 2018. ]

#### LEGISLATIVE COUNSEL'S DIGEST

SB 1422, Portantino. California Safe Drinking Water Act: microplastics.

Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration programs relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting implementing regulations, and conducting studies and investigations to assess the quality of water in private domestic water supplies. Under the act, the implementing regulations are required to include, but are not limited to, monitoring of contaminants and requirements for notifying the public of the quality of the water delivered to customers.

This bill would require the state board, on or before July 1, 2020, to adopt a definition of microplastics in drinking water, and on or before July 1, 2021, to adopt a standard methodology to be used in the testing of drinking water for microplastics and requirements for 4 years of testing and reporting of microplastics in drinking water, including public disclosure of those results.

Vote: majority Appropriation: no Fiscal Committee: yes Local Program: no

#### THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 116376 is added to the Health and Safety Code, to read:

116376. (a) The state board, on or before July 1, 2020, shall adopt a definition of microplastics in drinking water.

(b) The state board, on or before July 1, 2021, shall do all of the following:

- (1) Adopt a standard methodology to be used in the testing of drinking water for microplastics.
- (2) Adopt requirements for four years of testing and reporting of microplastics in drinking water, including public disclosure of those results.
- (3) If appropriate, consider issuing a notification level or other guidance to aid consumer interpretations of the results of the testing required pursuant to this section.
- (4) Accredited qualified laboratories in California to analyze microplastics.

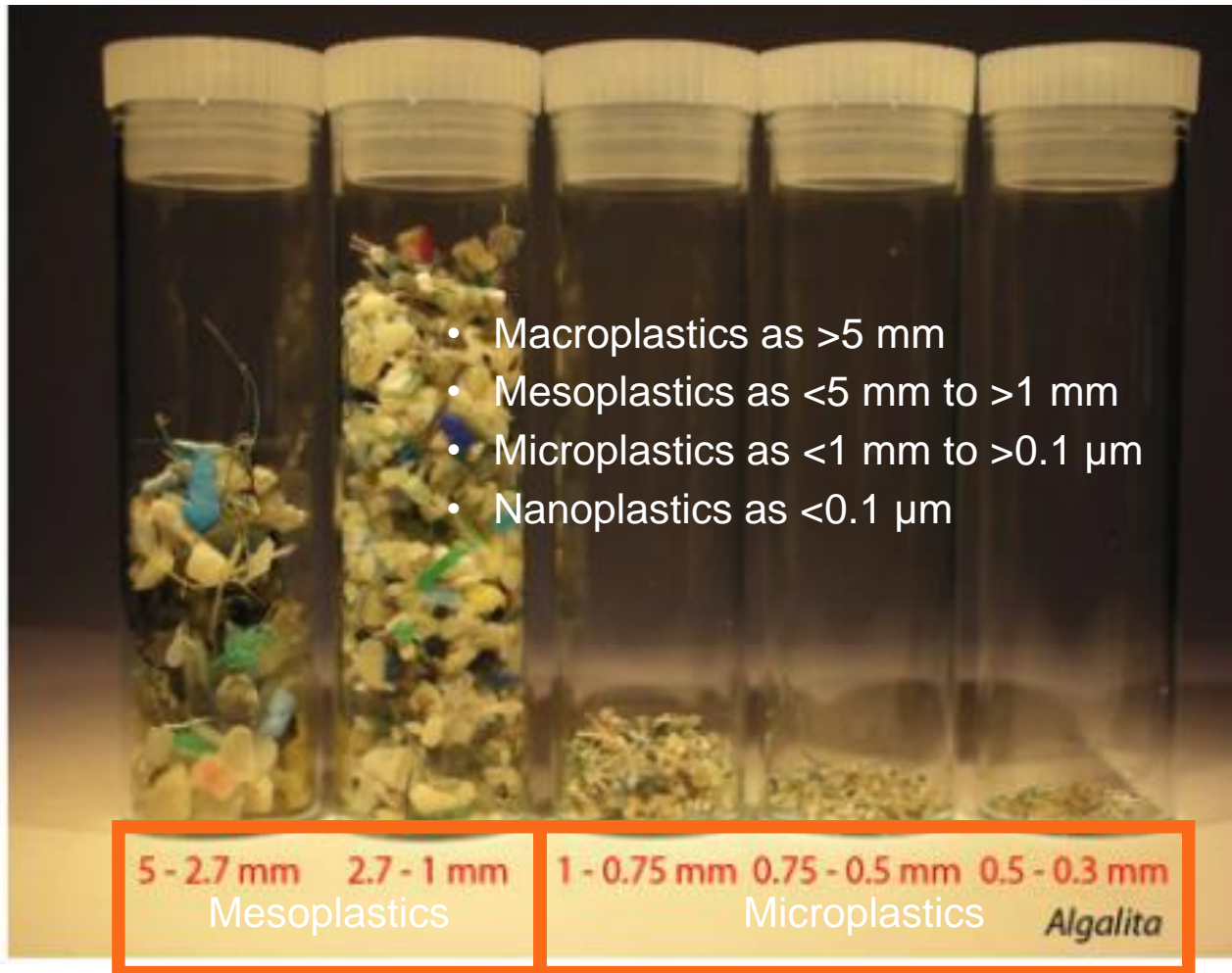
## On or before 7-1-20

- Adopt a Microplastics Definition

## On or before 7-1-21

- Adopt a Microplastics Test Method and Certify laboratories
- Adopt a Requirement for drinking water system testing (4 years)
- Adopt Results Disclosure and Notification Level requirements

# MICROPLASTICS DEFINITION - SIZE

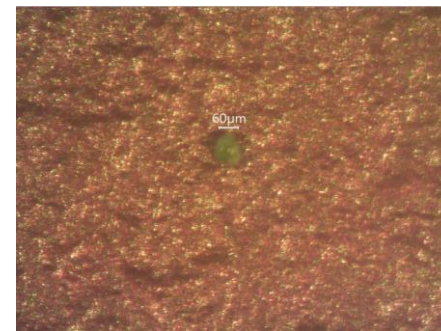
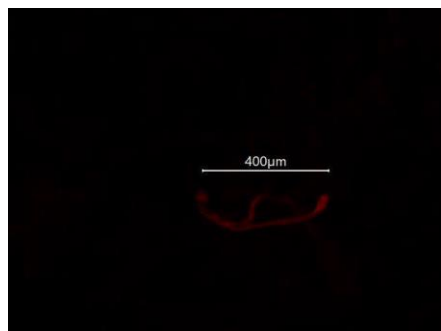


- Plastic Waste
- Atmosphere
- Cosmetics
- Runoff
- Laundry

# MICROPLASTICS DEFINITION - TYPES



## Morphology – fibers, fragments, pellets, foam



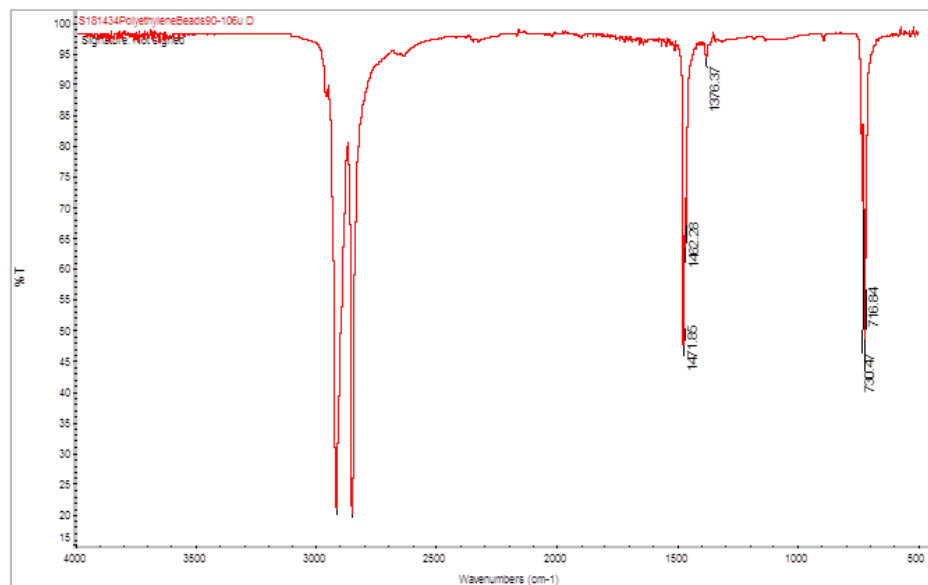
## Spectroscopy

PET

HDPE and LDPE

PP and PS

Nylon



# MICROPLASTICS TEST METHODS



## Measuring Microplastics: Building Best Practices for Sampling, Extraction and Analysis

Hosted by: HORIBA, Southern California Coastal Water Research Project Authority, and the University of Toronto  
In coordination with State of California Water Resources Control Board and the California Ocean Protection Council

Held at the Southern California Coastal Water Research Project Authority  
3535 Harbor Blvd  
Costa Mesa, CA 92626, USA

April 4, 2019

8:00 Coffee and networking

8:30 Welcome and introductions  
Welcome from the meeting organizers  
Motivation and goals for the meeting  
Description of meeting agenda

8:50 Ocean Protection Council Perspective  
Deborah Halberstadt, Executive Director

9:10 State Water Resources Control Board Perspective  
Darrin Polhemus, Deputy Director for Drinking Water

9:30 Microplastic Overview and Aspects Related to Human Health for Consideration  
Bob Andrews (Drinking Water Research Group, University of Toronto)  
Chelsea Rochman (Ecology and Evolutionary Biology, University of Toronto)

10:00 Break

10:20 Methods: State of the Science

- a. Methods for sampling microplastics - Paul Helm (Ontario Ministry of Environment, Parks and Conservation)
- b. Extracting microplastics from different environmental matrixes - Amy Lusher (Norwegian Institute for Water Research)
- c. Techniques for identifying and quantifying microplastics prior to, or in lieu of, spectroscopy - Keenan Munno (University of Toronto)
- d. FTIR in microplastic research: Towards a harmonized and standardized analysis – Sebastian Pimpke (Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research)
- e. Microplastics quest using pyrolysis GC-MS - Ashok Deshpande (NOAA)

12:00 Lunch on site (\$10)

1:00 Methods: State of the Science (continued)

- f. Raman Spectroscopy in correlative microscopy / spectroscopy workflows – Silke Christiansen (Helmholtz Zentrum Berlin für Materialien und Energie & Max Planck Institute for the Science of Light)

- g. Microplastics in drinking water: Development and Automation of Raman Microspectroscopy - Marco Pittroff (TZW Technologiezentrum Wasser)
- h. QA/QC for microplastics sampling, analysis and reporting – Chelsea Rochman (University of Toronto)
- i. Planned European method evaluation study - Amy Lusher (Norwegian Institute for Water Research)

2:20 Break

2:40 Example microplastics data collection programs in California

- j. Microplastics in San Francisco Bay – Carolyn Box (5 Gyres)
- k. Microplastics in wastewater effluent - Steve Carr (Los Angeles County Sanitation Districts)
- l. USEPA Region 9 progress toward standardizing microplastic measurement methods - Anna-Marie Cook (US EPA)

3:40 Group discussion with stakeholders about their needs:  
What is your most urgent need at this moment?  
What would you like to see in a best practices report?  
What types of methods would you like to see developed?  
What are some of the key concerns that should be taken into consideration when developing/choosing best methods and practices?

4:40 Wrap-up  
Next steps towards methods standardization

5:00 Adjourn



# TAKE HOME MESSAGE



1. Headlines matter
2. The Political and Legislative process TRUMPs the conventional regulatory framework
3. Analytical technology supports and fosters Contaminant of Emerging Concern (CEC) monitoring and lower levels of detection
4. Occurrence Data clarifies everything
5. Collaboration and Stakeholder involvement is key

# In Memorium



**Dr. Michael Dziewatkoski**



# Thank You



## Questions?

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