Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS)

PFOA and PFOS are fluorinated organic chemicals that are part of a larger group of chemicals referred to as per- and poly-fluoroalkyl substances (PFASs). PFOS and PFOA have been extensively produced and studied in the United States. These manmade substances have been synthesized for water and lipid resistance. They have been used extensively in consumer products such as carpets, clothing, fabrics for furniture, paper packaging for food, and other materials (e.g., cookware) designed to be waterproof, stain-resistant or non-stick. In addition, they have been used in fire-retarding foam and various industrial processes.

People are exposed to PFOS and PFOA through food, food packaging, consumer products, house dust, and drinking water. Exposure through drinking water has become an increasing concern due to the tendency of PFASs to accumulate in groundwater. Such contamination is typically localized and associated with a specific facility, for example, an industrial facility where these chemicals were manufacture or used in other products, or airfield which used the chemicals for firefighting. Between 2000 and 2002, PFOS was voluntarily phased out of production in the U.S. by its primary manufacturer. Beginning in 2006 other manufacturers began to voluntarily limit the number of ongoing uses.

Since these chemicals have been used in an array of consumer products, scientists have found PFOA and PFOS in the blood of nearly all people tested. According to the Center for Disease Control (CDC), blood levels of both PFOS and PFOA have steadily decreased in U.S. residents since 1999-2000.

In May 2016, the United States Environmental Protection Agency (U.S. EPA) issued a lifetime health advisory for PFOS and PFOA for drinking water, advising municipalities that they should notify their customers of the presence of levels over 70 parts per trillion in community water supplies. U. S. EPA recommended that the notification of customers include information on the increased risk to health, especially for susceptible populations. Based on the current available peer-reviewed studies on laboratory animals and epidemiological evidence in human populations, the U.S. EPA released the following statement:

Notification Level

Health and Safety Code section 116271 delegates to the Division of Drinking Water's (DDW) Deputy Director the authority "to take action pursuant to Article 5," including the power to issue a notification level (NL) pursuant to Health and Safety Code section 116455.

In response to a request from DDW, **the Office of Environmental Health Hazard Assessment (OEHHA) recommended interim NLs** for PFOA (based on liver toxicity, as well as cancer risks) and for PFOS (based on immunotoxicity). OEHHA made these recommendations following its review of currently available health-based advisories and standards and supporting documentation. After independent review of the available information on the risks, DDW established NLs at concentrations 13 parts per trillion for **PFOS** and 14 parts per trillion for **PFOA.** These levels are consistent with OEHHA's recommendations.

Certain requirements and recommendations apply to a water system if it serves customers drinking water containing a contaminant greater than its notification level. In addition to notification levels and pursuant to Health and Safety Code section 116455, DDW has established a single response level for PFOS and PFOA based on U.S. EPA's conclusion that the lifetime health advisory is applicable to both short-term and chronic risk assessment scenarios. The health advisory level offers a margin of protection for all persons throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water and suggests that parents of formula-fed infants may consider the use of an alternative drinking water source or using formula that does not require adding water. The response level for PFOA and PFOS is a total concentration of 70 ppt for both contaminants, which is approximately five (5) times the individual notification level. When possible, DDW recommends removing the source from service or providing treatment when the concentration exceeds the notification level. DDW recommends removing the source from service when the concentration level cannot be reduced below the response level of 70 ppt.

Once OEHHA issue its final recommendations for NLs for the two compounds, DDW will consider whether revisions to the NLs are appropriate.

Analytical Methods and Reporting

DDW has identified EPA Method 537 Rev. 1.1. as a validated analytical method for detecting perfluorinated compounds in drinking water. This method is capable of detecting the following 14 perfluorinated compounds:

STORET Code	CHEMICAL	Abbreviation
C2801	PERFLUOROBUTANESULFONIC ACID	PFBS
C2802	PERFLUOROHEPTANOIC ACID	PFHpA
C2803	PERFLUOROHEXANE SULFONIC ACID	PFHxS
C2804	PERFLUORONONANOIC ACID	PFNA
C2805	**PERFLUOROOCTYL SULFONATE**	**PFOS**
C2806	**PERFLUOROOCTANOIC ACID**	**PFOA**
C2807	N-ETHYL PERFLUOROOCTANESULFONAMIDOACETIC ACID	NEtFOSAA
C2808	N-METHYL PERFLUOROOCTANESULFONAMIDOACETIC ACID	NMeFOSAA
C2809	PERFLUORODECANOIC ACID	PFDA
C2810	PERFLUORODODECANOIC ACID;	PFDoA
C2811	PERFLUOROHEXANOIC ACID	PFHxA
C2812	PERFLUOROTETRADECANOIC ACID	PFTA

Findings in California Drinking Water

From 2013 to 2015,UCMR3 required all large water systems (i.e., water systems serving over 10,000 people) to collect and analyze more than12,000 drinking water samples for PFOS and PFOA. In addition, some water systems serving less than 10,000 people reported approximately 400 drinking water results for PFOS and PFOA. This occurrence data identified 36 sources with PFOS detections and 32 sources with PFOA detections.

Drinking water systems are not currently required by state regulations to monitor for PFOA and/or PFOS. Nevertheless, because of concerns about possible contamination, some water systems have voluntarily chosen to sample their supplies for PFOA and PFOS.

The occurrence data for UCMR3 can be accessed at: https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule. A summary of the findings for California is available **here**.

References

California Environmental Contaminant Biomonitoring Program, 2015, Potential Designated Chemicals: Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) (PDF), State of Californian, March.

Centers for Disease Control and Prevention (CDC, 2009). Fourth National Report on Human Exposure to Environmental Chemicals. U.S. Department of Health and Human Services. (PDF)

US EPA, 2014. Emerging Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) (PDF), US Environmental Protection Agency, March.

US EPA, 2016. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), May. (PDF)

Sulfonate." 81 Fed. Reg. 101, May 25, 2016. (PDF)

(Page last updated 7/13/18)

Drinking Water Resources

Chemicals and Contaminants
Consolidation and Extension of Service
Cyanobacteria/Cyanotoxins in Drinking Water
Consumer Confidence Reports (CCRs)
DRINC Portal
Drinking Water Branch Districts

Drinking Water Supply Service Area Lookup Tool
Drinking Water Watch Database
Electronic Annual Reports (EAR)
Enforcement Actions
Environmental Laboratory Accreditation Program (ELAP)

Funding for Public Water Systems
Information for Public Water Systems
Lab-To-State Portal - Electronically Lead and Copper Submittal
Operator Certification - Drinking Water
Permits
Public Water System Monitoring Schedules

Regulations and Statutes

Water is a precious resource in California, and maintaining its quality is of utmost importance to safeguard the health of the public and the environment.

Statewide Campaigns

- EPA Water Sense
- Report an Environmental Concern
- Save Our Water
- Flex Alert
- Register to Vote

Quick Links

- Board Agendas
- Fees
- Make a Payment
- Help / Business Help

Resources

OIMA
CEDEN
Data & Databases
Drought Information
FAAST
Language Access Complaint
Queja de Acceso al Idioma