



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7

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ORIGINATING SECTION: WATER QUALITY/OFFICE OF THE GENERAL MANAGER
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AGENDA DATE: April 17, 2019

ITEM NO. 9

SUBJECT: Per- and polyfluoroalkyl Substances (PFAS) Detections in Groundwater

SUMMARY:

Zone 7 is committed to plan, design, operate, and maintain its water supply system to deliver high quality water that meets all public health regulatory requirements set under the Safe Drinking Water Act. To ensure a further margin of safety, Zone 7's water quality policy sets internal water quality targets to be no greater than 80 percent of the applicable primary State or federal regulatory requirements. Zone 7 follows a robust sampling and monitoring program to ensure that it meets these targets.

Per- and polyfluoroalkyl substances (PFAS) are a large group of human-made substances that do not occur naturally in the environment. The chemical bond between carbon and fluorine in these substances is what makes them extremely strong and stable; however, this also means they are resistant to breaking down in the natural environment and can last for years or decades, which lends them bioaccumulation in nature and as well as in humans.

These substances have been used extensively in the United States since the 1940's, particularly in surface coating and protectant formulations due to their ability to repel oil, grease and water. They have been utilized in the manufacture of paper and cardboard packaging products, carpets, leather products, non-stick cookware and textiles, as well as in firefighting foams.

Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are two of the most prevalent and widely studied PFAS compounds. Since these chemicals have been used in an array of consumer products and can have many different exposure methods, scientists have found PFOA and PFOS in the blood of nearly all people tested. Between 2000 and 2002, PFOS production was voluntarily discontinued in the United States by its primary manufacturer. Beginning in 2006, other manufacturers began to voluntarily limit the number of ongoing uses through USEPA's PFOA Stewardship Program. According to the Center for Disease Control (CDC), blood levels of both PFOS and PFOA have steadily decreased in the U.S. residents since CDC testing began in 1999.

PFAS are classified by the EPA as "contaminants of emerging concern". There is limited research to date, but some studies shown that they may cause adverse health effects. Additional research is needed to determine the full scope of PFAS impacts on human health. While there are no federal or State limits at this time, regulatory bodies have recommended voluntary testing. Since protecting our customers' health and safety is our highest priority, Zone 7 voluntarily

implemented proactive monitoring for several PFAS. During the most recent monitoring efforts, PFOS and PFOA were detected in Zone 7's groundwater supplies; PFOS and PFOA were not detected in its surface water supply. Zone 7 has proactively and immediately taken steps and implemented procedures to reduce PFOS below California's recommended Response Level in the delivered water from the Mocho Wellfield. Treatment options for reduction of PFOS include Reverse Osmosis (RO) Membrane filtration and blending of water sources. Zone 7 has not identified any single source in its service area for these contaminants. Zone 7 is currently developing groundwater monitoring and investigation plans to determine the source(s) of contamination in the groundwater basin.

BACKGROUND AND DISCUSSION:

Zone 7 supplies treated drinking water to the retail and direct customers in the Livermore-Amador Valley. On the average, Zone 7 supplies approximately 80% treated surface water and 20% groundwater pumped by its wells to its water customers. This ratio of surface water to groundwater varies depending upon the season, hydrologic conditions and customer's location in the Valley.

Since protecting our customers' health and safety is our highest priority, Zone 7 voluntarily conducted proactive monitoring for several PFAS at some of its drinking water sources in 2013, and at all sources in late 2018 and early 2019. With technological advancements, we are now able to conduct more accurate testing; for example, the MRLs (Minimum Reporting Limits) are much lower now (2 ppt for both PFOA and PFOS) than in 2013 (20 ppt for PFOA and 40 ppt for PFOS). Also, we are able to monitor for more analytes; the 2013 PFAS monitoring included 6 contaminants and the latest monitoring was expanded to 14 contaminants.

There is currently no federal or State required standards i.e. Maximum Contaminant Levels (MCLs) in California for any PFAS. In July 2018, the California State Water Resources Control Board Division of Drinking Water (DDW) issued guidelines for testing and reporting two PFAS chemicals (PFOA and PFOS). During the most recent monitoring efforts (November 2018 through January 2019), PFOS and PFOA were detected in Zone 7's groundwater supplies; PFOS and PFOA were not detected in its surface water supply.

Some of Zone 7's groundwater wells have PFOS above its Notification Level (NL) of 13 parts per trillion (ppt) as indicated below:

<u>Supply Source</u>	<u>PFOS Average (ppt)</u>	<u>PFOS Range (ppt)</u>
Chain of Lakes Wellfield	24	12 – 35
Mocho Wellfield	38	< 2 – 86

One of the groundwater wells, Mocho Well No. 1, has PFOS concentration exceeding DDW's recommended Response Level (RL) of 70 ppt. Currently available treatment options for Zone 7 for the Mocho Wellfield include RO Membrane filtration and blending of water sources.

PFOA was also detected in some of the wells, but the levels were well below its NL of 14 ppt. Although some additional PFAS were detected in Zone 7's water supplies, at present there are no regulatory guidelines for these contaminants.

In March 2019, DDW also launched a state-wide phased investigation and issued orders to operators of hundreds of susceptible drinking water sources, including Zone 7 and City of Pleasanton, to conduct quarterly PFAS monitoring for at least one year.

Since detecting PFAS, following is a list of the actions taken or planned by Zone 7:

- Informed the Zone 7 Board, Retailers, DDW and Zone 7's direct customers.
- Implemented procedures to reduce PFOS/PFOA below DDW's recommended RL in the delivered water from the Mocho Wellfield.
- Posted PFAS Information on the Zone 7 website: [PFAS information](#)
- Plan to conduct quarterly monitoring per DDW's March 15, 2019 Order.
- Plan to include PFAS monitoring results in the 2018 CCR that will be posted on Zone 7 website in July 2019.
- Developing groundwater monitoring and investigation plans to determine the source(s) of contamination in the groundwater basin.
- Continue to support Retailers' efforts.
- Continue to monitor the regulatory and research developments related to PFAS.

ATTACHMENT:

DDW PFAS Frequently Asked Questions (FAQs) Fact Sheet

ADDITIONAL SOURCES OF INFORMATION:

DDW: <https://www.waterboards.ca.gov/pfas/>

USEPA: <https://www.epa.gov/pfas>

Frequently Asked Questions (FAQs)

PFAS General

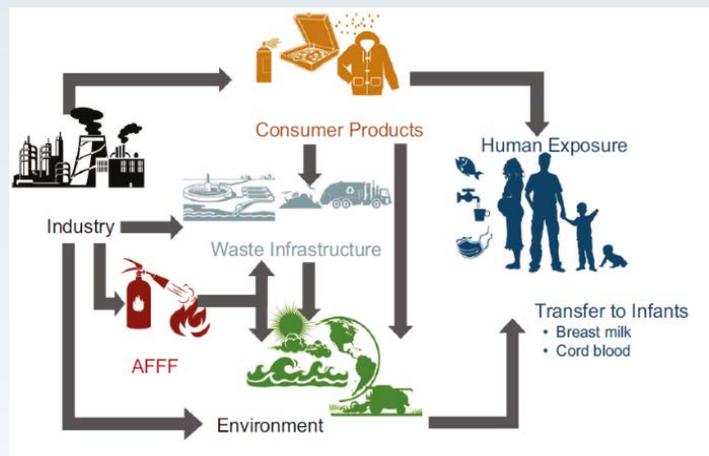
What are per- and polyfluoroalkyl substances (PFAS)?

Per- and polyfluoroalkyl substances (PFAS) are a large group of human-made substances that do not occur naturally in the environment and are resistant to heat, water, and oil. PFAS have been used extensively in surface coating and protectant formulations due to their unique ability to reduce the surface tension of liquids [1]. Perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two types of PFAS that are no longer manufactured or imported into the United States [2]; however, there could be some imported goods containing trace amounts of these substances[3]. Other PFAS goods and materials are still produced and used in the United States [4].

PFAS are persistent in the environment, can accumulate within the human body over time, and are toxic at relatively low concentrations [5]. Exposure to unsafe levels of PFOA/PFOS may result in adverse health effects including developmental effects to fetuses during pregnancy, cancer, liver effects, immune effects, thyroid effects, and other effects (such as cholesterol changes)[6]. PFOA and PFOS were found in the blood of nearly all people tested in several national surveys[7], [8]. 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[9].

How are people exposed to PFOA, PFOS and other PFAS?

PFAS can be introduced into the body by eating or drinking contaminated food or liquid (including water), breathing in or touching products treated with PFAS, such as carpets or clothing [10]. Contaminated drinking water has led to high levels of exposure to PFOA, PFOS, and other PFAS for some populations residing near manufacturing facilities[11]. Infants may be exposed to PFAS through breastfeeding[12]. Workers in facilities that make or use PFAS can be exposed to higher amounts of these chemicals and have higher levels in their blood[13].



Major exposure pathways of PFAS to humans. Figure from Sunderland et. al. (2019)

Under the PFOA Stewardship Program with the U.S. Environmental Protection Agency (US EPA), eight major PFAS producers have phased out PFOA and other PFSA substances from emissions and products[2].

To complement the PFOA Stewardship Program, US EPA has issued regulations, known as Significant New Use Rules (SNURs), requiring manufacturers and processors of these chemicals to notify EPA of new uses of these chemicals before they are commercialized[20]. Specifically, the regulations require that anyone who intends to manufacture (including import) or process any chemicals for uses contained in the SNUR must submit a notification to EPA at least 90 days before beginning the activity[20]. This provides EPA with an opportunity to review and, if necessary, place limits on manufacturers or processors who intend to reintroduce or import products with these chemicals.

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