



June 16, 2015

## **Perfluorooctane Sulfonate (PFOS) Fact Sheet**

The Alaska Department of Health and Social Services Section of Epidemiology, created this fact sheet to address community concerns about the recent discovery of perfluorooctane sulfonate (PFOS) in water wells on Eielson Air Force Base and in the Moose Creek residential area in the Fairbanks North Star Borough, Alaska.

PFOS is a perfluorinated chemical (PFC). PFCs are manmade chemicals that have been used for both residential and industrial purposes. PFCs are used in products that resist fire, stains, grease and water such as furniture and carpets treated for stain resistance, stain or waterproof resistant clothing, firefighting foams and food packaging. PFCs are very persistent in the environment and can travel long distances in water and air.

The Air Force is currently providing drinking water to Moose Creek area residents whose well water has tested positive for PFOS at levels higher than federal provisional levels. This fact sheet aims to inform readers about the characteristics of PFOS and its health effects.

### ***What is PFOS?***

Perfluorooctane sulfonate (PFOS) is a manmade chemical manufactured in the United States until 2002. PFOS was used primarily in firefighting foam and as a coating additive to provide stain repellent or fire resistant properties to clothing, upholstery, carpet and furniture.

### ***How might I be exposed to PFOS?***

PFOS is widespread and persistent in the environment. It has been found in small quantities in water around the world and can be found at low concentrations in food. It has also been found in the blood or tissues of various species of wildlife such as fish and marine mammals.

PFOS is commonly found in the US population. The 1999-2000 National Health and Nutrition Examination Survey (NAHNES) conducted by the US Centers for Disease Control and Prevention, showed PFCs could be found in more than 99 percent of the U.S. population. This indicated a widespread exposure of the population to PFCs during the decades leading up to the study. The follow-up NHANES study conducted in 2011-2012 showed a decrease in PFC levels measured in the blood of the US population, suggesting a decrease in the general exposure. The main PFOS exposure pathways are ingestion of food or water and inhalation of dust particles contaminated with PFOS.

Because it used to be widely employed to make everyday objects such as fire or stain-resistant materials, children may be exposed to small doses of PFOS within the home by hand-to-mouth contact.

Accidental releases of PFOS in the environment -resulting in water or soil contamination - can be sources of higher than usual exposure for the local populations if no protective measures are taken.

### ***How can PFOS affect my health?***

Current research has not clearly shown that PFOS exposure is related to specific illnesses. Studies on people who work with PFCs (which include PFOS), who generally have higher blood PFC levels than the rest of the population, have not consistently shown that long-term exposure to PFCs is linked to health problems. Some recent studies have associated PFOS exposure to some adverse health effects on the immune system and the liver, but these associations need to be confirmed by additional research.

At this time, the scientific evidence is insufficient to determine if long-term exposure to PFOS might cause any particular disease. Therefore, we cannot determine if drinking your well water would be the cause of current or future health problems. The U.S. Environmental Protection Agency (US EPA) is still evaluating whether PFCs can cause cancer in humans.

### ***Has the federal government made recommendations to protect human health?***

In January 2009, the US EPA established a provisional health advisory (PHA) level of 0.2 micrograms PFOS per liter of water ( $\mu\text{g/L}$ ) as a basis to assess the potential risk of short-term exposure through

drinking water. The PHA was developed to protect public health and was based on exposure of children because they typically consume a larger volume of water per body weight than adults (1 liter per day). Further assessment of the health risks of exposure to PFOS is underway.

***What is the Alaska Section of Epidemiology doing to address community concerns about exposure to PFOS in drinking water?***

The Section of Epidemiology is working with US EPA, the Alaska Department of Environmental Conservation, the Agency for Toxic Substances and Disease Registry, and the US Air Force to better understand the potential risk of exposure to PFOS from well water consumption by Moose Creek community residents and Air Force base personnel. The section is exploring further steps to complement the body of data that was recently collected. The section is also available as a resource for Moose Creek community residents and Eielson Air Force base residents to address any public-health related concerns and answer any health-related questions residents may have.

***Is it safe to shower, bathe or brush my teeth with my well water?***

**Yes.** The potential risks of exposure from showering, bathing, or brushing your teeth are low because

- PFOS is not significantly absorbed through the skin.
- PFOS is not easily transferred from water to air. This limits exposure by inhalation.
- Studies that tested the toxic effect of PFOS on animals show that PFOS is not a skin irritant, but that it can be mildly irritating to the eye. However, in these studies, the concentrations of PFOS were much larger than those that one could be exposed to while taking a shower, and therefore, are not relevant under residential conditions at Moose Creek.

***Can my family or my pets drink my tap water?***

If your test results are at or above EPA's provisional health advisory level, the Section of Epidemiology recommends you do not drink your tap water or give it to your pets and other animals. Work with the Eielson Air Force Base Public Affairs office at 907-377-2116 to have your water tested if you have not done so already.

Considering the fluctuations in the water table, a one-time test may not fully guarantee the safety of your drinking water over time. The Air Force, in collaboration with the Alaska Department of Environmental Conservation and the US EPA will design a sampling protocol to monitor the wells that tested negative for PFOS over time and ensure that the water of these wells remain safe for consumption.

***Can I clean my house, wash clothes, and rinse food with my well water?***

**Yes.** Cleaning surfaces or clothes with well water will only result in a small PFOS residue.

***Can I breastfeed my child if I have been exposed to my well water?***

Exposure through breast milk can occur but studies show that PFOS levels in breast milk are much lower than they are in the mother's blood. PFOS does not seem to concentrate in breast milk. Breastfeeding benefits are very well documented and mothers who breastfeed are encouraged to keep doing so.

***Is it safe to cook with my well water?***

PFOS is resistant to heat and is not volatile. Therefore, heating or boiling will not destroy or remove it from the water.

- If the PFOS level in your well water exceeds US EPA's provisional level, it is not recommended to use the water for cooking.
- You can still use well water to boil eggs as this will not result in any significant exposure.

***Is it safe to water my garden vegetables with my well water?***

**Yes.** A study by the Minnesota Department of Health showed that plants watered with PFOS-contaminated water absorbed very little of the chemical. Overall, the study concluded that the health benefits from growing and eating homegrown produce greatly outweigh any potential risks from low PFOS concentrations.

***Is the fish from Garrison Slough safe to eat??***

The Section of Epidemiology (SOE) does not currently know the extent of PFOS contamination in the fish in Garrison Slough. The US EPA and some states have developed screening values for PFOS in fish to help public health officials develop fish consumption recommendations for these fish. Eielson Air Force Base officials are working to collect fish from the slough and test for PFOS. When this information is available, SOE will work with Eielson officials and other agencies to develop and disseminate guidance and recommendations for fish consumption.

***How can I tell how much PFOS is in my body?***

The half-life of PFOS in the body (the time it takes for half the amount of a chemical to leave the body if no additional exposure occurs) is about five to six years. PFOS can be measured in the blood; however, the test is not routine. The presence of PFOS in the blood may indicate that you

have been exposed to PFOS; however, that does not mean you will suffer adverse health effects. The body's natural elimination processes are the only way to remove PFOS from the body. Currently, there is no set value for what level of PFOS in blood may increase an individual's risk for adverse health effects.

***Where can I find more information about PFOS?***

You can contact the Alaska Section of Epidemiology at 907-269-8000

You can also find additional information on the following websites:

- AK Environmental Public Health Program: <http://www.epi.alaska.gov/eh>
- ATSDR's PFCs Toxicology Profile: <http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=1116&tid=237>
- EPA's Fact Sheet on PFOS and PFOA: [http://www2.epa.gov/sites/production/files/2014-04/documents/factsheet\\_contaminant\\_pfos\\_pfoa\\_march2014.pdf](http://www2.epa.gov/sites/production/files/2014-04/documents/factsheet_contaminant_pfos_pfoa_march2014.pdf)