Per- and Polyfluoroalkyl Substances (PFAS) Update: Concerns Grow as PFAS Detection Continues in Source Waters

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Per- and Polyfluoroalkyl Substances (PFAS), also referred to as perfluorinated compounds, continue to pose a challenge to drinking water supplies nationwide. Originally manufactured for use as aqueous film forming foam (AFFF) and nonstick surfacing, PFAS are chained organofluorine compounds that are difficult to treat due to their strong carbon-fluorine bonds that are slow to degrade in the environment and resistant to conventional water treatment processes. As runoff containing PFAS enters drinking water supplies, PFAS pose a threat to public health when they are absorbed and accumulated in the human body. PFAS have been linked to developmental, reproductive, and immune issues in laboratory animals if ingested.

Per- and Polyfluoroalkyl Substances (PFAS) are frequently used in a multitude of consumer products and in aqueous film forming foams for fire fighting.

While the U.S. Environmental Protection Agency (EPA)'s lifetime health advisories for PFAS compounds in drinking water remain unchanged (0.070 µg/L perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), individually or combined), significant national and local funding has been allocated to encourage PFAS detection and investigation of emerging PFAS. For 2018, the EPA launched community engagement events to bring awareness to PFAS contamination and lead PFAS management planning for affected communities. In addition, the EPA may issue a regulatory determination for the purposes of establishing a MCL for PFOS and PFOA in 2019.

At the National Leadership Summit in May 2018, the EPA Administrator announced four actions that the Agency will be taking to manage potential risks posed by PFAS:

1. EPA will initiate steps to evaluate the need for a maximum contaminant level (MCL) for PFOA and PFOS. EPA will convene with federal partners and examine all that is known about PFOA and PFOS in drinking water.

2. EPA is beginning the necessary steps to propose designating PFOA and PFOS as "hazardous substances" through one of the available statutory mechanisms, such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 102.

3. EPA is currently developing groundwater cleanup recommendations for PFOA and PFOS at contaminated sites and will complete this task by fall of this year.

4. EPA is taking action in close collaboration with federal and state partners to develop toxicity values for GenX (Perfluoro-2-propoxypropanoic acid) and perfluorobutanesulfonic acid (PFBS) by the summer of 2018.

The EPA may issue a regulatory determination in 2019. Additionally, local state agencies are leading major campaigns to track and contain PFAS contaminations, such as:

- The Michigan PFAS Action Response Team (MPART) with the Michigan Department of Environmental Quality has formed a multi-agency group focused on testing and identifying PFAS in drinking water, wastewater, groundwater, and sediments.

- The New Jersey Department of Environmental Protection updated drinking water guidance levels for PFOA that are below the EPA's lifetime health advisory (0.014 µg/L). PFOS guidance levels are still under review but remain at the EPA's lifetime health advisory level of 0.070 µg/L. A groundwater standard level of 0.010 µg/L was issued for perfluorononanoic acid (PFNA) and has been proposed as an amendment MCL under the SDWA.

- The Vermont Department of Health set a health advisory level of 0.020 µg/L for the sum of five PFAS: PFOA, PFOS, PFNA, perfluorohexane sulfonic acid (PFHxS), and perfluoroheptanoic acid (PFHpA).

- The Pennsylvania legislature introduced House Bill 705 last year, which would set a standard of 5 parts per trillion (ppt) for PFOA, and the same amount for PFOS. Currently the bill is sitting in the House Environmental Resources and Energy committee.

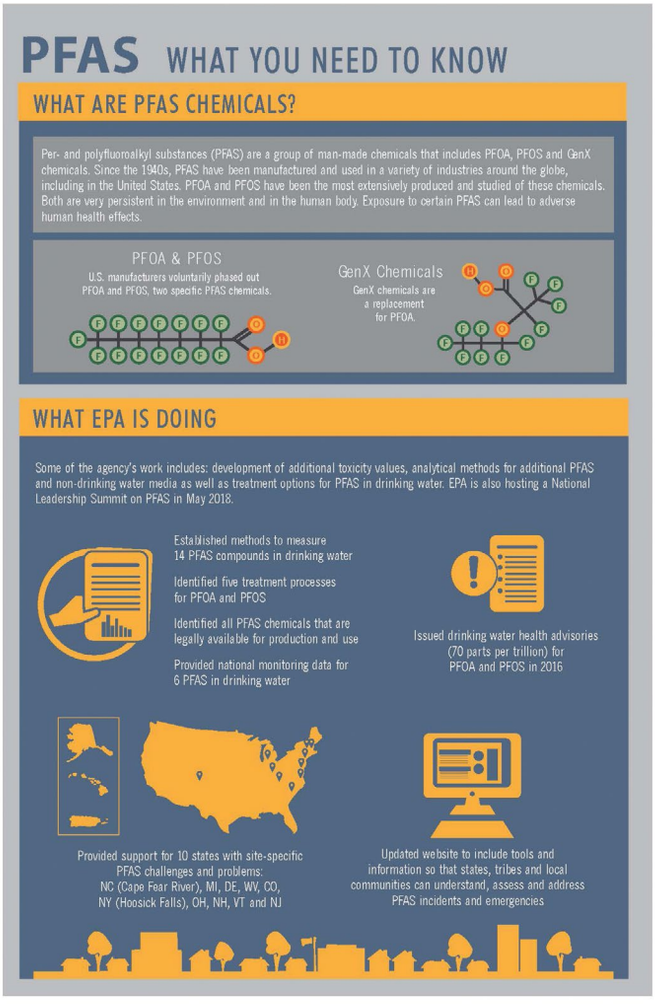
- Recently, emerging PFAS known as "GenX" has gained industry attention after concentrations higher than 0.800 µg/L were detected in North Carolina watersheds, primarily contributed by industrial chemical facilities. In July 2017, the North Carolina Department of Health and Human Services issued a drinking water health goal of 0.140 µg/L for GenX.

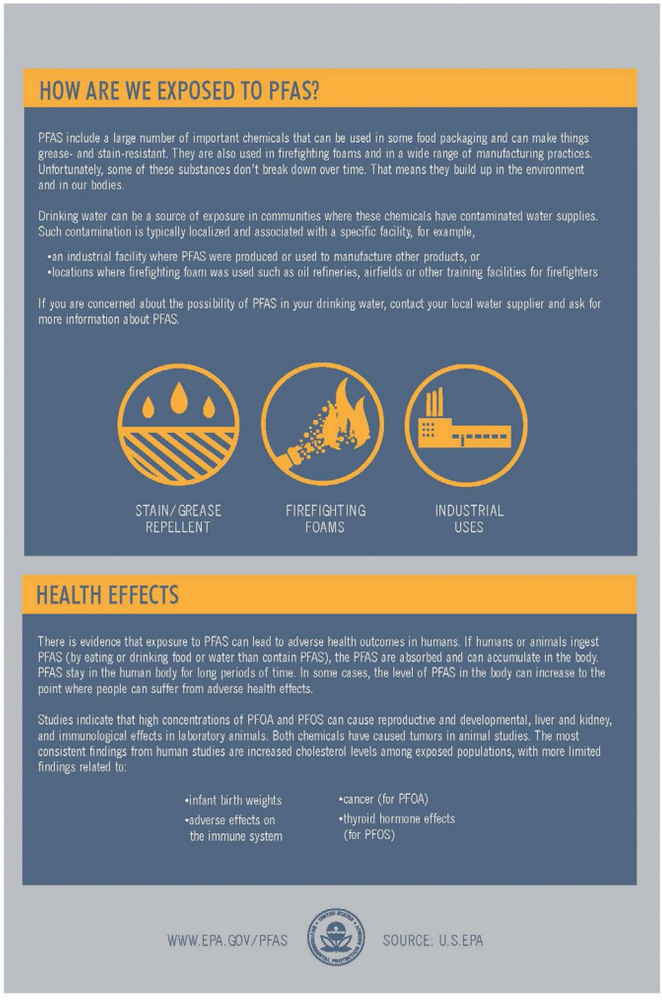
Treatment methods for PFAS remain under investigation; certain technologies (GAC, IX, High-pressure membranes) are leading the market for removal of PFAS. Granular activated carbon (GAC), which uses adsorption as the mechanism for PFAS removal, has been widely implemented as a PFAS treatment method. Ion exchange (IX), a process that uses resin to exchange ions with hydroxyl, is also highly capable of removing PFAS from the source water. Prior to full-scale implementation, both processes benefit from rapid small-scale column testing (RSSCT) or pilot testing to evaluate the removal capabilities of the selected media/resin and breakthrough contaminant curve. High-pressure membranes are also effective at removing these compounds. Considerations for PFAS treatment processes should be made to minimize contamination from PFAS treatment waste products like backwash water, spent media/resin, and brine waste.

Further information on the fate, impacts, and treatment of PFAS can be found at: https://www.epa.gov/pfas.

A risk assessment provided by the North Carolina Department of Health and Human Services can be found at: https://deq.nc.gov/news/hot-topics/genx-investigation/health-related-resources-about-genx-pfoa-and-pfas.

The EPA's comprehensive literature review that characterizes the health impacts of GenX can be found at: https://hero.epa.gov/hero/index.cfm/project/page/project_id/2627.





"PFAS What You Need to Know Infographic." EPA, Environmental Protection Agency, 27 Mar. 2018, www.epa.gov/pfas/pfas-what-you-need-know-infographic.