

Protocol #: 22-0905

Project Title: Assessment of Non-Drinking Water Human Exposures to Volatile PFASs Associated with AFFF-Impacted Sites in Colorado

Principal Investigator: John Adgate, PhD, MSPH

Date: 05/08/2025

colorado school of
public health

UNIVERSITY OF COLORADO
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Participant Resource Guide

Acronyms and Definitions:

PFAS: Per- and polyfluoroalkyl substances. Common PFAS measured in this study are PFOA, PFOS, PFHxS, PFNA, PFBS, HFPO-DA (also called Gen-X). The full chemical names of four to six letter acronyms can be found in the resource sites on the next page or by using your preferred search engine.

AFFF: Aqueous film-forming foam that contains PFAS and has been used to fight oil-based fires.

Health-Based Drinking Water Standards: The U.S. Environmental Protection Agency (US EPA) has developed specific health-based drinking water standards called maximum contaminant levels (MCLs). The US EPA established these legally enforceable MCL levels for each of the following PFAS in drinking water: PFOA, PFOS, PFHxS, PFNA, and HFPO-DA. The US EPA also established limits for PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and PFBS, using a Hazard Index MCL (see below). The Hazard Index MCL accounts for the combined and co-occurring levels of these PFAS in drinking water. For more details go to: <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>

Hazard Index MCL: A Hazard Index MCL is used to estimate the non-cancer health risk from exposure to a mixture of two or more of these PFAS: PFHxS, PFNA, HFPO-DA, and PFBS. A Hazard Index MCL of greater than 1.0 indicates increased risk of non-cancer health outcomes.

Nanogram: A nanogram is a measurement of weight. One nanogram weighs a billion times less than one gram, and almost a trillion times less than a pound.

Nanograms per liter (ng/L): It is the unit of measurement of PFAS in water. Nanograms per liter is the same as one part of PFAS to one trillion parts of water (parts per trillion - ppt).

Nanograms per gram (ng/g): It is the unit of measurement for PFAS in dust. One nanogram weighs a billion times less than one gram. This measurement is nanograms of PFAS per gram of dust.

Nanograms per cubic meter (ng/m³): It is the unit of measurement for PFAS in air. Nanograms of a substance per cubic meter of air. Ng/m³ means that one nanogram of PFAS is present in every cubic meter of air.

Non-Detects (ND): Laboratory analysis indicates that the compound concentration is below the minimum concentration the laboratory equipment at Colorado School of Mines can measure. It does not mean there are none of the specific substances in the sample, just that it is too low for the laboratory to read.

Percentile: Percentiles are not percents. A percentile tells you how many people in the population have exposures greater than and less than your level of exposure. If your percentile is below 50th, your levels are lower than one-half of the people in the study. If your percentile is above 50th, your levels are higher than one-half of the people in the study. Another example, if your level is in the 5th percentile then your measured level was lower than 95% of the measured levels of other people or households in our study. If your level is in the 95th percentile, then your measured level was greater than 95% of the measured levels of other people or households in the study.

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Other Resources:

The Agency for Toxic Substances and Disease Registry (ATSDR) and U.S. Environmental Protection Agency (US EPA) have the most up to date resources available regarding PFAS exposure, health, and mitigation for homeowners.

- PFAS FAQs and Health: <https://www.atsdr.cdc.gov/pfas/>.
- Filters to reduce PFAS levels in water: <https://www.epa.gov/system/files/documents/2024-04/water-filter-fact-sheet.pdf>
 - US EPA researchers found that granular activated carbon (GAC) or reverse osmosis (RO) point-of-use (e.g., on a kitchen or bathroom sink) and point-of-entry (whole house) filters reduced PFAS levels to non-detectable levels.
 - If concerns remain, activated showerhead filters certified for PFAS removal can be installed for showers/bathtubs. Many of these filters use activated carbon (GAC).
- Full US EPA proposal for enforceable contamination levels of PFAS: <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>
- Comprehensive online resource for PFAS exposure and health information: <https://pfas-exchange.org/>

The best way to reduce PFAS in your indoor air, dust, and blood overtime is to reduce PFAS levels in your water, the foods you consume, and removing household products that contain PFAS.

Research Team Contact

The research team at the Colorado School of Public Health and Colorado School of Mines are available to answer any questions you may have about PFAS. Please contact our study team if you have any questions.

For questions or concerns regarding your results or the Indoor Air Study publication, please contact:

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