The Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) Data Summary: July 2023

Overview

EPA has released the first set of data collected under the Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) for the 30 chemical contaminants (29 per- and polyfluoroalkyl substances [PFAS] and lithium) listed in Table 1. This initial data release represents approximately 7% of the total results that EPA expects to receive over the next three years. The Agency will update the results quarterly in EPA's National Contaminant Occurrence Database (NCOD) until completion of data reporting in 2026. Data are added and possibly removed or updated over the course of this reporting cycle following further review by analytical laboratories, public water systems (PWSs), states, and EPA. Before conducting your own assessment of the data, please review the Data Considerations section. For answers to common questions regarding accessing and understanding the UCMR 5 data, as well as information on PFAS and lithium in drinking water, please review the UCMR 5 website.

UCMR 5 will provide new data that will improve EPA's understanding of the frequency these contaminants are found in the nation's drinking water systems, and at what levels. The monitoring data on PFAS and lithium will help the Agency make determinations about future regulations and other actions to protect public health under the Safe Drinking Water Act (SDWA). This monitoring also helps federal, state, and other researchers prioritize studies for health effects information, identify data gaps, and determine the need for future studies to improve our understanding of the possible health risks associated with these contaminants in public drinking water. Through the Bipartisan Infrastructure Law, EPA is helping states, Tribes, and especially small, disadvantaged, and rural communities to leverage billions of dollars in funding dedicated to investments in infrastructure solutions. Those investments will allow communities to remove emerging contaminants, like PFAS and lithium, from their drinking water. For more information, visit EPA's website.

Based on this limited initial set of data, we note the following:

- PFOA and PFOS are two of the most widely studied PFAS. One or each of these two PFAS was measured at or above EPA's minimum reporting level (MRL), and therefore above EPA's Health Advisory (HA) levels, in the first sampling event for 7.8-8.5% of PWSs with results to date.
- The other two PFAS with EPA HA levels are HFPO-DA ("GenX chemicals") and PFBS. HFPO-DA was measured above its HA level by 1 of 2,002 PWSs. PFBS was not found above its HA level.
- HA levels have not been established for the other 25 PFAS that are part of UCMR 5.
    - Nine of these 25 PFAS were measured at or above their respective MRL by 1-207 of approximately 2,000 PWSs.
    - For the other 16 PFAS, no PWSs have reported results at or above their respective MRLs.
- EPA has not published a HA level for lithium but has calculated a Health Reference Level (HRL) for screening purposes. To date, 22% of PWSs have reported lithium results above the screening HRL.

Additional details on contaminant health effects information and a summary of occurrence results to date may be found in Table 2 and Table 3, respectively.

Background

EPA uses the UCMR program to collect nationally representative data for contaminants that may be present in drinking water but are not yet subject to regulatory standards set under SDWA. This monitoring is used by EPA to understand the frequency and level of occurrence of unregulated contaminants in the nation's PWSs. Every five years, taking into consideration EPA's Contaminant Candidate List (CCL), the Agency develops a new list of UCMR contaminants for monitoring. SDWA, as amended by Section 2021 of America's Water Infrastructure Act of 2018, calls for EPA to:

- Issue a list of unregulated contaminants to be monitored by certain PWS types[1] every five years
- Require large PWSs (*i.e.*, those that serve more than 10,000 people) to monitor the contaminants
- Require small PWSs serving between 3,300 and 10,000 people to monitor, subject to the availability of EPA appropriations and sufficient laboratory capacity
- Require a nationally representative sample of small PWSs serving less than 3,300 people to monitor
- Make analytical results available in NCOD

State and local officials may also use UCMR data to assess the need for actions to protect public health. When evaluating UCMR data, one should consider the following:

- UCMR monitoring generates a robust dataset that is representative of national occurrence.
- UCMR results are available after PWSs and the laboratories that support their monitoring have reported results to EPA (up to four months after the samples are collected). Small PWS results may be available sooner relative to large PWS results since the laboratories contracted by EPA to analyze small PWS samples are contractually obligated to report results within a shorter timeframe.
- There is information about health effects and treatment techniques to address some of these unregulated contaminants.

[1] UCMR 5 requirements apply to community water systems (CWSs) and non-transient non-community water systems (NTNCWSs). They do not apply to transient non-community water systems (TNCWSs). The use of "PWS" throughout this document refers to participating CWSs and NTNCWSs. For more information on PWS types, visit EPA's website.

Table 1. Contaminants and Methods

Contaminant	CASRN[1]	EPA Method	Contaminant Classification
lithium	7439-93-2	200.7	Metal/Pharmaceutical
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)	13252-13-6	533	PFAS
perfluorobutanesulfonic acid (PFBS)	375-73-5	533	PFAS
perfluorooctanesulfonic acid (PFOS)	1763-23-1	533	PFAS
perfluorooctanoic acid (PFOA)	335-67-1	533	PFAS
perfluorohexanesulfonic acid (PFHxS)	355-46-4	533	PFAS
perfluorononanoic acid (PFNA)	375-95-1	533	PFAS
perfluorobutanoic acid (PFBA)	375-22-4	533	PFAS
perfluorohexanoic acid (PFHxA)	307-24-4	533	PFAS
perfluorodecanoic acid (PFDA)	335-76-2	533	PFAS
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	533	PFAS
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	533	PFAS
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	533	PFAS
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	533	PFAS
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	533	PFAS
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	533	PFAS
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	533	PFAS
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	533	PFAS
perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	533	PFAS
perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	533	PFAS
perfluorododecanoic acid (PFDoA)	307-55-1	533	PFAS
perfluoroheptanesulfonic acid (PFHpS)	375-92-8	533	PFAS
perfluoroheptanoic acid (PFHpA)	375-85-9	533	PFAS
perfluoropentanesulfonic acid (PFPeS)	2706-91-4	533	PFAS
perfluoropentanoic acid (PFPeA)	2706-90-3	533	PFAS
perfluoroundecanoic acid (PFUnA)	2058-94-8	533	PFAS
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	537.1	PFAS
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	537.1	PFAS
perfluorotetradecanoic acid (PFTA)	376-06-7	537.1	PFAS
perfluorotridecanoic acid (PFTrDA)	72629-94-8	537.1	PFAS

[1] CASRN – Chemical Abstracts Service Registry Number

Information About UCMR 5 Results

The purpose of this document is to (1) summarize UCMR 5 results reported to date and (2) provide context around UCMR 5 results in relation to EPA established minimum reporting levels (MRLs) and, if available, health-based reference values (*i.e.*, reference concentrations and reference doses [RfDs]). The UCMR 5 MRLs are the lowest concentrations that laboratories may report to EPA during UCMR 5 monitoring. UCMR MRLs are determined using data from multiple laboratories that participate in EPA's MRL-setting studies and are not associated with contaminant health effects information. EPA establishes MRLs to ensure consistency in the quality of the information reported to the Agency.

Depending on the available health and toxicological information for a UCMR 5 contaminant, a reference concentration (*e.g.*, a lifetime Health Advisory [HA] level, Health Reference Level [HRL]) in drinking water may be available. Reference concentrations can be derived from an RfD (*i.e.*, a non-cancer endpoint) or an oral cancer slope factor (CSF) (*i.e.*, a cancer endpoint), if available, and consider additional assumptions about body weight and drinking water intake. The health-based reference values identified in this document do not represent regulatory limits or action levels and should not be interpreted as an indication of future Agency actions. UCMR occurrence data are used to inform the Agency's Regulatory Determination process (*i.e.*, the process that addresses potential regulatory actions for unregulated contaminants).

Community water systems (CWSs) required to monitor under UCMR must inform their customers of UCMR results (including the average and range of results) in their annual Consumer Confidence Report (CCR). See 40 CFR 141.153(d)(7) for the CCR regulatory requirements and Section IV of EPA's guidance Preparing Your Drinking Water Consumer Confidence Report for details on the content of the report. Additional resources are available on EPA's CCR Compliance Help web page.

Non-transient non-community water systems (NTNCWSs), such as an office park or school that operates its own water system, and CWSs required to monitor under UCMR must inform their customers of the availability of all UCMR results through Tier 3 Public Notification (PN). See 40 CFR 141.207 for the PN regulatory requirements and EPA's PN Compliance Help web page for guidance.

EPA recognizes the high interest in timely access to UCMR results and is committed to publicly posting results on the Agency's web page approximately quarterly (following large PWS review of their UCMR results and EPA review of small PWS results). EPA manages the laboratory analyses for small PWSs and will work to communicate their results in a timely manner. Large PWSs wishing to have earlier access to their data should consider making arrangements with their UCMR 5 laboratory for early notification of particular UCMR results (*i.e.*, before their contracted laboratory posts the results to the UCMR web-based reporting system).

States may establish requirements (regulatory or non-regulatory) for drinking water contaminants not yet regulated by EPA, and those requirements may be based on state-established levels that differ from EPA's reference concentrations. PWSs are responsible for being aware of and complying with their state's requirements, if any.

On March 14, 2023, EPA announced a proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS included in UCMR 5 monitoring. The proposed PFAS NPDWR does not require any actions until it is finalized. EPA's PFAS website provides additional information on Agency actions to address PFAS contamination, describes current PFAS research, and identifies related tools and resources.

Available drinking water treatment information for UCMR 5 contaminants can be found in EPA's Drinking Water Treatability Database.

Health-Based Reference Values

Table 2 provides health-based reference values (*i.e.*, reference concentrations and RfDs) for each contaminant monitored under UCMR 5, if available. To identify reference values, EPA applied the following principles:

(1) Reference concentrations and RfDs were compiled from the following publicly available resources:
   a. Drinking Water Health Advisories (HAs),
   b. Integrated Risk Information System (IRIS) Assessments,
   c. Technical Support Document for the Final CCL 5 – Contaminant Information Sheets, and
   d. Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles

   The above resources are the products (or compilation) of peer-reviewed health assessments. The reference values are subject to change as new health assessments are completed; they are not legally enforceable federal standards.

(2) If health information was available from more than one of the resources listed above, the most recent health information was used.

(3) If both cancer and non-cancer reference concentrations were available from the most recent resource, the lower (more conservative) of the two concentrations was used. Please review references and footnotes in Table 2 for additional health effects information.

(4) If an RfD (*i.e.*, a non-cancer endpoint) was the basis for the reference concentration, and both chronic and subchronic/short-term exposure values were available from the most recent resource, the lower concentration (associated with the chronic exposure) was used. Please review references and footnotes in Table 2 for additional health effects information (*e.g.*, additional short-term, subchronic, or chronic values).

(5) For the contaminants that do not have a reference concentration available from a resource listed above, only the RfDs from finalized health assessments are provided in Table 2, if available. If a health assessment is in process, a link to additional information about its status is provided.

EPA considers this a "living document" and will update Table 2 as new health-based information becomes available. For example, the Agency is currently using the 2022 EPA lifetime HA levels for GenX chemicals, PFBS, PFOS, and PFOA as reference concentrations for UCMR 5 and will update the values, as appropriate, when the final PFAS NPDWR is promulgated.

Table 2. Minimum Reporting Levels (MRLs) and Health-Based Reference Values

Contaminant [note: to convert to ng/L or parts per trillion (ppt), multiply by 1,000]	MRL (µg/L)	Health-Based Reference Values		Reference(s)
		Reference Concentration (µg/L)	RfD (mg/kg-day)	
lithium[1]	9	HRL = 10	Subchronic and Chronic Provisional RfD = 2×10^{-3}	Technical Support Document for the Final CCL 5 – Contaminant Information Sheets (2022)
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)[2,3]	0.005	Lifetime HA = 0.01	Chronic RfD = 3×10^{-6}	Drinking Water Health Advisory: Hexafluoropropylene Oxide (HFPO) Dimer Acid and HFPO Dimer Acid Ammonium Salt, Also Known as "GenX Chemicals" (2022)
perfluorobutanesulfonic acid (PFBS)[2,3]	0.003	Lifetime HA = 2	Chronic RfD = 3×10^{-4}	Drinking Water Health Advisory: Perfluorobutane Sulfonic Acid and Related Compound Potassium Perfluorobutane Sulfonate (2022)
perfluorooctanesulfonic acid (PFOS)[3,4]	0.004	Lifetime Interim HA = 0.00002	Chronic RfD = 7.9×10^{-9}	INTERIM Drinking Water Health Advisory: Perfluorooctane Sulfonic Acid (PFOS) (2022)
perfluorooctanoic acid (PFOA)[3,4]	0.004	Lifetime Interim HA = 0.000004	Chronic RfD = 1.5×10^{-9}	INTERIM Drinking Water Health Advisory: Perfluorooctanoic Acid (PFOA) (2022)
perfluorohexanesulfonic acid (PFHxS)[3,5]	0.003	-	ATSDR: Minimal Risk Level = 2×10^{-5} (intermediate duration)	ATSDR Toxicological Profile for Perfluoroalkyls (2021)
perfluorononanoic acid (PFNA)[3,5]	0.004	-	ATSDR: Minimal Risk Level = 3×10^{-6} (intermediate duration)	ATSDR Toxicological Profile for Perfluoroalkyls (2021)
perfluorobutanoic acid (PFBA)	0.005	-	Chronic RfD = 1×10^{-3} Subchronic RfD = 6×10^{-3}	Integrated Risk Information System (IRIS) Assessment (2022)
perfluorohexanoic acid (PFHxA)	0.003	-	Subchronic and Chronic RfD = 5×10^{-4}	Integrated Risk Information System (IRIS) Assessment (2023)

[1] The reference concentration is the Health Reference Level (HRL) calculated as part of the CCL 5 process and is based on the RfD from the following health assessment: Provisional Peer-Reviewed Toxicity Values (PPRTV), 2008.

[2] More information is available on the final lifetime HAs for GenX chemicals and PFBS.

[3] On March 14, 2023, EPA announced a proposed NPDWR for six PFAS (GenX chemicals, PFBS, PFOS, PFOA, PFHxS, and PFNA). After EPA has considered public comments and publishes a final PFAS NPDWR, EPA will update the reference concentrations for these six PFAS as appropriate.

[4] More information is available on the interim lifetime HAs for PFOA and PFOS.

[5] In process/draft EPA Integrated Risk Information System (IRIS) assessments for PFHxS and PFNA.

Contaminant [note: to convert to ng/L or parts per trillion (ppt), multiply by 1,000]	MRL (µg/L)	Health-Based Reference Values		Reference(s)
		Reference Concentration (µg/L)	RfD (mg/kg-day)	
perfluorodecanoic acid (PFDA)	0.003	-	-	IN PROCESS/DRAFT Integrated Risk Information System (IRIS) Assessment
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OudS)	0.005	-	-	-
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	0.005	-	-	-
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	0.003	-	-	-
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	0.005	-	-	-
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.003	-	-	-
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.002	-	-	-
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.02	-	-	-
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	0.003	-	-	-
perfluoro-3-methoxypropanoic acid (PFMPA)	0.004	-	-	-
perfluoro-4-methoxybutanoic acid (PFMBA)	0.003	-	-	-
perfluorododecanoic acid (PFDoA)	0.003	-	-	-
perfluoroheptanesulfonic acid (PFHpS)	0.003	-	-	-
perfluoroheptanoic acid (PFHpA)	0.003	-	-	-
perfluoropentanesulfonic acid (PFPeS)	0.004	-	-	-
perfluoropentanoic acid (PFPeA)	0.003	-	-	-
perfluoroundecanoic acid (PFUnA)	0.002	-	-	-
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.005	-	-	-
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.006	-	-	-
perfluorotetradecanoic acid (PFTA)	0.008	-	-	-
perfluorotridecanoic acid (PFTrDA)	0.007	-	-	-

Terms and Definitions

a) **MRL** – UCMR Minimum Reporting Level. The lowest concentration that laboratories may report to EPA during UCMR 5 monitoring. MRLs are not associated with health effects information. More specifically, an MRL is the quantitation limit for a contaminant that is considered achievable, with 95% confidence, by at least 75% of laboratories nationwide using a specified analytical method (recognizing that individual laboratories may be able to measure at lower levels). **[Note that the Agency for Toxic Substances and Disease Registry (ATSDR) uses the term "MRL" for a different purpose (*i.e.*, to describe "Minimal Risk Level"). The UCMR term and the ATSDR term have no relationship to each other.]**

b) **Ref Conc** – Reference Concentration. Published EPA Drinking Water Health Advisories (HAs) and the Health Reference Levels (HRLs) from EPA's Fifth Contaminant Candidate List (CCL 5). These reference concentrations are derived from peer-reviewed health assessments published by EPA or other governmental agencies. They are not legally enforceable federal standards and are subject to change as new health assessments are completed. Depending on available health effects information, a reference concentration in drinking water can be derived from a reference dose (RfD) (*i.e.*, a non-cancer endpoint) or a cancer slope factor (CSF) (*i.e.*, a cancer endpoint), and considers additional assumptions about body weight and drinking water intake.

c) **HA** – Health Advisory. Provides information on a contaminant that can cause negative human health effects and is known or anticipated to occur in drinking water. SDWA authorizes EPA to issue HAs for contaminants that are not subject to a National Primary Drinking Water Regulation (NPDWR). EPA's HAs are non-enforceable and non-regulatory and provide technical information to state agencies and other public health officials on health effects, analytical methods, and treatment technologies associated with drinking water contaminants. The HA documents include the derivation of the HA levels, which are the concentrations of contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations, such as one day, 10 days, or a lifetime. The lifetime HA for the drinking water contaminant is calculated from its associated Drinking Water Equivalent Level (DWEL), obtained from its RfD, and incorporates a drinking water Relative Source Contribution (RSC) factor of contaminant-specific data or a default of 20% of total exposure from all sources. For more information, visit EPA's Drinking Water HAs web page. Answers to frequently asked questions on EPA's lifetime HAs for PFAS are also available.

d) **HRL** – Health Reference Level. Derived during the CCL 5 process for screening purposes. HRLs are used in EPA's Regulatory Determination process as risk-derived concentrations against which to evaluate the occurrence data to determine if contaminants occur at levels of public health concern. To determine the HRL for a chemical, EPA considered adverse health effects that may pose a greater risk to specific life stages and other sensitive groups which represent a meaningful portion of the population. HRLs are not final determinations about the level of a contaminant in drinking water that is necessary to protect any particular population and, in some cases, are derived prior to development of a complete exposure assessment using the best available data. HRLs are not legally enforceable federal standards. For more information on HRL derivation, please see the Technical Support Document for the Final CCL 5 – Contaminant Information Sheets.

e) **RfD** – Oral Reference Dose. A non-cancer estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It is typically derived by dividing a point-of-departure (POD) from a selected dose-response study (*e.g.*, no-observed-adverse-effect level [NOAEL], lowest-observed-adverse-effect level [LOAEL], benchmark dose [BMD]) by the uncertainty factors (UFs) applied to reflect database limitations. Chronic RfDs are typically derived from animal toxicological studies with an exposure duration of months to years, representing a lifetime exposure in humans. Subchronic RfDs are typically derived from animal toxicological studies with an exposure duration of 31 to 90 days, representing a less than lifetime exposure in humans (up to 10% of average lifespan). Visit EPA's IRIS website for more information about RfD derivation.

f) **Minimal Risk Levels** – Developed by ATSDR as screening tools to help identify chemicals that may be of concern. A minimal risk level is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified route and duration of exposure. Minimal risk levels are derived when reliable and sufficient data exist to identify the target organ(s) of effect or the most sensitive health effect(s) for a specific duration for a given route of exposure. These substance specific estimates, which are intended to serve as screening levels, are used by ATSDR health assessors to determine areas and populations potentially at risk for health effects from exposure to a particular substance. Exposure above the minimal risk level does not mean that health problems will occur. Instead, it may act as a signal to health assessors to look more closely at a particular site where exposures may be identified. Minimal risk levels do not define regulatory or action levels for ATSDR.

Table 3. July 2023 Data Summary[1]

Contaminant	MRL[2] (µg/L)	Ref Conc[3] (µg/L)	Total number of results	Number of results ≥MRL	Number of results >Ref Conc[4]	% of total results >Ref Conc[4]	Total number of PWSs with results	Number of PWSs with results ≥MRL	Number of PWSs with results >Ref Conc[4]	% of PWSs with results >Ref Conc[4]
lithium	9	10	5,365	1,579	1,132	21.1%	2,236	681	494	22.1%
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)	0.005	0.01	4,668	6	1	0.02%	2,002	6	1	0.05%
perfluorobutanesulfonic acid (PFBS)	0.003	2	4,667	316	0	0.0%	2,003	192	0	0.0%
perfluorooctanesulfonic acid (PFOS)[5]	0.004	0.00002	4,665	279	279	6.0%	2,001	170	170	8.5%
perfluorooctanoic acid (PFOA)[5]	0.004	0.000004	4,667	267	267	5.7%	2,002	156	156	7.8%
perfluorohexanesulfonic acid (PFHxS)	0.003	-	4,666	219	-	-	2,001	123	-	-
perfluorononanoic acid (PFNA)	0.004	-	4,668	14	-	-	2,002	9	-	-
perfluorobutanoic acid (PFBA)	0.005	-	4,667	313	-	-	2,002	198	-	-
perfluorohexanoic acid (PFHxA)	0.003	-	4,668	322	-	-	2,002	198	-	-
perfluorodecanoic acid (PFDA)	0.003	-	4,669	2	-	-	2,002	1	-	-
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.005	-	4,669	0	-	-	2,002	0	-	-
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	0.005	-	4,669	0	-	-	2,002	0	-	-
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	0.003	-	4,669	0	-	-	2,002	0	-	-
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	0.005	-	4,669	23	-	-	2,002	14	-	-

[1] This data summary represents approximately 7% of total results that EPA expects to receive over the next three years. Analytical results from the UCMR program are reported by laboratories and provided by EPA in micrograms/liter (µg/L, parts per billion). To convert results in µg/L to nanograms/liter (ng/L, parts per trillion), multiply the value by 1,000. UCMR results do not represent locational running annual averages.

[2] MRL – EPA established Minimum Reporting Level. Based on laboratory capability; not related to contaminant health effects information.

[3] Ref Conc – Reference Concentration. EPA Health Advisories (HAs) for four PFAS and EPA's CCL 5 Health Reference Level (HRL) for lithium.

[4] EPA HAs and HRLs are expressed with one significant digit; comparison of UCMR results to HAs and HRLs is therefore based on one significant digit. Results ≥0.015 µg/L for GenX chemicals and ≥2.5 µg/L for PFBS round to ≥0.02 µg/L and ≥3 µg/L, respectively, and are identified as above reference concentrations. Results for lithium are likewise identified as above the reference concentration if they are ≥15 µg/L.

[5] The HA levels for PFOA and PFOS are below the levels that can be reliably measured; thus, the UCMR 5 MRLs for PFOA and PFOS are greater than the HA levels. Any result at or above the MRL for PFOA or PFOS is understood to be above its HA level. The number and % of PWSs with results above the reference concentration for PFOA and/or PFOS is greater than or equal to the number and % of PWSs with results at or above the UCMR 5 MRL.

Contaminant	MRL[2] (µg/L)	Ref Conc[3] (µg/L)	Total number of results	Number of results ≥MRL	Number of results >Ref Conc[4]	% of total results >Ref Conc[4]	Total number of PWSs with results	Number of PWSs with results ≥MRL	Number of PWSs with results >Ref Conc[4]	% of PWSs with results >Ref Conc[4]
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.003	-	4,669	0	-	-	2,002	0	-	-
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.002	-	4,669	0	-	-	2,002	0	-	-
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.02	-	4,641	0	-	-	1,989	0	-	-
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	0.003	-	4,669	0	-	-	2,002	0	-	-
perfluoro-3-methoxypropanoic acid (PFMPA)	0.004	-	4,669	0	-	-	2,002	0	-	-
perfluoro-4-methoxybutanoic acid (PFMBA)	0.003	-	4,669	0	-	-	2,002	0	-	-
perfluorododecanoic acid (PFDoA)	0.003	-	4,669	0	-	-	2,002	0	-	-
perfluoroheptanesulfonic acid (PFHpS)	0.003	-	4,668	0	-	-	2,002	0	-	-
perfluoroheptanoic acid (PFHpA)	0.003	-	4,669	118	-	-	2,002	72	-	-
perfluoropentanesulfonic acid (PFPeS)	0.004	-	4,670	5	-	--	2,002	5	-	-
perfluoropentanoic acid (PFPeA)	0.003	-	4,668	356	-	-	2,002	207	-	-
perfluoroundecanoic acid (PFUnA)	0.002	-	4,643	0	-	-	1,989	0	-	-
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.005	-	4,596	0	-	-	1,854	0	-	-
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.006	-	4,596	0	-	-	1,854	0	-	-
perfluorotetradecanoic acid (PFTA)	0.008	-	4,596	0	-	-	1,854	0	-	-
perfluorotridecanoic acid (PFTrDA)	0.007	-	4,596	0	-	-	1,854	0	-	-

Data Considerations

Data are presented as tab delimited text files within zip files (see below for descriptions), with field names included in the first row of each file and no text qualifier. EPA suggests importing each field into your choice of software as text. Some of the IDs can otherwise be misinterpreted as long integer field types when they contain alpha characters. For further assistance, please refer to the document "Instructions for Accessing Results from UCMR 5" on the UCMR Occurrence Data web page. Additional reference material, including common questions and answers on accessing and understanding the UCMR 5 data, is available on EPA's UCMR 5 website.

To view results or perform additional analyses, select one of the following zip files from UCMR 5 (2023-2025) Occurrence Data:

- **UCMR 5 Occurrence Data** to view ALL the analytical results (*i.e.*, results for all analytes reported by all public water systems to date). Note that we expect the **UCMR5_all.txt** file to become too large to be imported into Excel once the majority of the UCMR 5 results are reported, in which case you can try other applications (*e.g.*, Microsoft Access) or import a subset of the data as described below.
- **UCMR 5 Occurrence Data by State** to view ALL the analytical results to date, organized by Tribes and states. Within that zip file, one text file (**UCMR5_All_Tribes_AK_LA.txt**) will have all results for Tribal systems and for the states starting alphabetically with A through L; another (**UCMR5_All_MA_WY.txt**) will have all results for the states starting alphabetically with M through W. The results are organized this way to address file size limitations and make data management easier.
- **UCMR 5 Occurrence Data by Method Classification** to view ALL analytical results to date for all systems by analytical method. Within that zip file, you will find individual text files with results organized by method (*e.g.*, a Method 200.7 text file with results for lithium).

The following text files for the **additional data elements** (*i.e.*, parameters beyond analytical results for the 30 UCMR 5 contaminants) are also contained in the above zip files:

- **UCMR5_ZipCodes.txt** – U.S. Postal Service Zip Code(s) for all areas served by a PWS
- **UCMR5_AddtlDataElem.txt** – Additional data elements: DisinfectantType, TreatmentInformation, LithiumOccurrence, LithiumTreatment, PFASOccurrence, PFASTreatment, PotentialPFASSources, PotentialPFASSourcesDetail
    - EPA is not asking PWSs for a formal, in-depth, source water evaluation for potential PFAS sources and recognizes that some PWSs will have more complete information than others. EPA's PFAS Analytic Tools can serve as a starting point to answer this question and are accessible here.

Table 4. Data Definitions for Text Files: UCMR5_All, UCMR5_All_Tribes_AK_LA, UCMR5_All_MA_WY, and UCMR5_*MethodNumber*

Field Name	Definition
PWSID	Public Water System (PWS) Identification Code. The code used to identify each PWS. The code begins with the standard 2-character postal state abbreviation or Region code; the remaining 7 numbers are unique to each PWS in the state
PWSName	Name of the PWS
Size	Size category of the PWS for UCMR 5, based on retail population as indicated by the Safe Drinking Water Information System (Federal) (SDWIS/FED) as of February 1, 2021: **S** (≤ 10,000), **L** (> 10,000)
FacilityID	Identification code for each applicable facility associated with water treatment or delivery at the PWS
FacilityName	Name of the facility at the PWS
FacilityWaterType	Source of water at the facility: **SW** (surface water), **GW** (groundwater), **GU** (groundwater under the direct influence of surface water), **MX** (Any combination of: SW, GW, and GU)
SamplePointID	Identification code for each sample point location at a PWS
SamplePointName	Name of the sample point at the PWS

Field Name	Definition
SamplePointType	Sampling Point Type Code: **EP** (entry point to the distribution system)
AssociatedFacilityID	Null for UCMR 5
AssociatedSamplePointID	Null for UCMR 5
CollectionDate	Date of sample collection (month, day, year)
SampleID	Identification code for each sample
Contaminant	The UCMR 5 contaminant analyzed
MRL	Minimum Reporting Level (MRL) defined by UCMR 5 in µg/L for the contaminants
Units	Units of the MRL and analytical results: **µg/L**
MethodID	Identification code of the analytical method
AnalyticalResultsSign	Sign indicating whether the analytical result is less than (**<**) the MRL or equal to (**=**) a numeric value at or above the MRL
AnalyticalResultValue	Numeric value of the analytical result in µg/L for the contaminants. Null values represent less than MRL
SampleEventCode	Identification code for each sample event**:** **SE1**, **SE2**, **SE3**, **SE4**
MonitoringRequirement	AM (Assessment Monitoring)
Region	EPA Region (states): **1** (CT, ME, MA, NH, RI, VT), **2** (NJ, NY, PR [Puerto Rico], VI [Virgin Islands]), **3** (DE, DC, MD, PA, VA, WV), **4** (AL, FL, GA, KY, MS, NC, SC, TN), **5** (IL, IN, MI, MN, OH, WI), **6** (AR, LA, NM, OK, TX), **7** (IA, KS, MO, NE), **8** (CO, MT, ND, SD, UT, WY), **9** (AZ, CA, HI, NV, AS [American Samoa], GU [Guam], MP [Northern Marianas Islands], NN [Navajo Nation]), **10** (AK, ID, OR, WA)
State	State abbreviation; Tribal PWSs without primacy are attributed to an EPA Region (01, 02, 03, 04, 05, 06, 07, 08, 09, 10)
UCMR1SampleType	Null for UCMR 5

Table 5. Additional Data Definitions for Text File: UCMR5_ZipCodes

Field Name	Definition
ZipCode	U.S. Postal Service Zip Code(s) for all areas served by a PWS. This data is entered by the PWS.

Table 6. Additional Data Definitions for Text File: UCMR5_AddtlDataElem

Additional Data Element	Definition and Response Options
DisinfectantType	All of the disinfectants/oxidants that have been added prior to and at the entry point to the distribution system. Please select ALL that apply. **PEMB** = Permanganate, **HPXB** = Hydrogen peroxide, **CLGA** = Gaseous chlorine, **CLOF** = Offsite generated hypochlorite (stored as a liquid form), **CLON** = Onsite generated hypochlorite, **CAGC** = Chloramine (formed with gaseous chlorine), **CAOF** = Chloramine (formed with offsite hypochlorite), **CAON** = Chloramine (formed with onsite hypochlorite), **CLDB** = Chlorine dioxide, **OZON** = Ozone, **ULVL** = Ultraviolet light, **OTHD** = Other types of disinfectant/oxidant, **NODU** = No disinfectant/oxidant used
TreatmentInformation	Treatment information associated with the sample point. Please select ALL that apply. **CON** = Conventional (non-softening, consisting of at least coagulation/sedimentation basins and filtration), **SFN** = Softening, **RBF** = River bank filtration, **PSD** = Pre-sedimentation, **INF** = In-line filtration, **DFL** = Direct filtration, **SSF** = Slow sand filtration, **BIO** = Biological filtration (operated with an intention of maintaining biological activity within filter), **UTR** = Unfiltered treatment for surface water source, **GWD** = Groundwater system with disinfection only, **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **AIR** = Air stripping (packed towers, diffused gas contactors), **POB** = Pre-oxidation with

Additional Data Element	Definition and Response Options
	chlorine (applied before coagulation for CON or SFN plants or before filtration for other filtration plants), **MFL** = Membrane filtration, **IEX** = Ionic exchange, **DAF** = Dissolved air floatation, **CWL** = Clear well/finished water storage without aeration, **CWA** = Clear well/finished water storage with aeration, **ADS** = Aeration in distribution system (localized treatment), **OTH** = Other types of treatment, **NTU** = No treatment used, **DKN** = Do not know
LithiumOccurrence	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Have you tested for the contaminant in your drinking water in the past? **YES** = If yes, did you modify your treatment and if so, what types of treatment did you implement? (see **LithiumTreatment**); **NO** = Have never tested for the contaminant; **DK** = Do not know.
LithiumTreatment	If yes, select ALL that apply: **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **IEX** = Ionic exchange, **NRO** = Nanofiltration and reverse osmosis, **OZN** = Ozone, **BAC** = Biologically active carbon, **MFL** = Membrane filtration, **UVL** = Ultraviolet light, **OTH** = Other, **NMT** = Not modified after testing
PFASOccurrence	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Have you tested for the contaminant in your drinking water in the past? **YES** = If yes, did you modify your treatment and if so, what types of treatment did you implement? (see **PFASTreatment**); **NO** = Have never tested for the contaminant; **DK** = Do not know.
PFASTreatment	If yes, select ALL that apply: **PAC** = Application of powder activated carbon, **GAC** = Granular activated carbon adsorption (not part of filters in CON, SFN, INF, DFL, or SSF), **IEX** = Ionic exchange, **NRO** = Nanofiltration and reverse osmosis, **OZN** = Ozone, **BAC** = Biologically active carbon, **MFL** = Membrane filtration, **UVL** = Ultraviolet light, **OTH** = Other, **NMT** = Not modified after testing
PotentialPFASSources	A yes or no answer provided by the PWS for each entry point to the distribution system. Question: Are you aware of any potential current and/or historical sources of PFAS that may have impacted the drinking water sources at your water system? **YES** = If yes, select ALL that apply (see **PotentialPFASSourcesDetail**); **NO** = Not aware of any potential current and/or historical sources; **DK** = Do not know
PotentialPFASSourcesDetail	If yes, select ALL that apply: **MB** = Military base, **FT** = Firefighting training school, **AO** = Airport operations, **CW** = Car wash or industrial launderers, **PS** = Public safety activities (*e.g.,* fire and rescue services), **WM** = Waste management, **HW** = Hazardous waste collection, treatment, and disposal, **UW** = Underground injection well, **SC** = Solid waste collection, combustors, incinerators, **MF** = Manufacturing, **FP** = Food packaging, **TA** = Textile and apparel (*e.g.,* stain- and water-resistant, fiber/thread, carpet, house furnishings, leather), **PP** = Paper, **CC** = Chemical, **PR** = Plastics and rubber products, **MM** = Machinery, **CE** = Computer and electronic products, **FM** = Fabricated metal products (*e.g.*, nonstick cookware), **PC** = Petroleum and coal products, **FF** = Furniture, **OG** = Oil and gas production, **UT** = Utilities (*e.g.,* sewage treatment facilities), **CT** = Construction (*e.g.,* wood floor finishing, electrostatic painting), **OT** = Other