Fifth Unregulated Contaminant Monitoring Rule

The Safe Drinking Water Act (SDWA) requires that once every five years the EPA issue a list of unregulated contaminants to be monitored by public water systems (PWSs).

The fifth Unregulated Contaminant Monitoring Rule (UCMR 5) was published on December 27, 2021. UCMR 5 requires sample collection for 30 chemical contaminants between 2023 and 2025 using analytical methods developed by the EPA and consensus organizations. This action provides the agency and other interested parties with scientifically valid data on the national occurrence of these contaminants in drinking water. Consistent with the EPA's PFAS Strategic Roadmap <https://epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>, UCMR 5 will provide new data that will improve the agency's understanding of the frequency that 29 per- and polyfluoroalkyl substances (PFAS) and lithium are found in the nation's drinking water systems, and at what levels. The monitoring data on PFAS and lithium will help the EPA make determinations about future regulations and other actions to protect public health under SDWA. The data will also ensure science-based decision-making, help the agency better understand whether these contaminants in drinking water disproportionally impact communities with environmental justice concerns, and allow the EPA, states, Tribes, and PWSs to target solutions.

Access Results

- UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder>
  - UCMR 5 Data Finder Walkthrough (video) <https://youtu.be/csjtrqankkk>
- UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>

- 40 CFR (Code of Federal Regulations, Title 40) Part 141: Final - Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 5) for Public Water Systems and Announcement of Public Meetings (pdf) <https://www.govinfo.gov/content/pkg/fr-2021-12-27/pdf/2021-27858.pdf> (27 pp, 650 K, About PDF <https://epa.gov/home/pdf-files>)

- UCMR 5 Occurrence Data Text Files (zip) <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#5>

- Press Release: EPA Releases Initial Nationwide Monitoring Data on 29 PFAS and Lithium <https://epa.gov/newsreleases/epa-releases-initial-nationwide-monitoring-data-29-pfas-and-lithium>
- UCMR 5 Program Overview Fact Sheet (pdf) <https://www.epa.gov/system/files/documents/2022-02/ucmr5-factsheet.pdf> (281.64 KB, December 2021, EPA 815-F-21-009)
    - Hoja informativa del programa (pdf) <https://www.epa.gov/system/files/documents/2022-08/spanish-ucmr5-factsheet-programoverview.pdf> (383.27 KB, December 2021, EPA 815-F-21-009S) (Spanish Version)
- Sample Collection Training Video for Small Public Water Systems <https://youtu.be/8chixutdpge>
- EPA Approved Laboratories for UCMR 5 <https://epa.gov/dwucmr/list-laboratories-approved-epa-fifth-unregulated-contaminant-monitoring-rule-ucmr-5>

On this page:

UCMR 5 Questions and Answers

The EPA has released the fifth set of data <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule> collected under UCMR 5 for 29 PFAS and lithium. The data released to date represent approximately 46% of the total results that the EPA expects to receive by completion of data reporting in 2026. The agency continues to conduct research and monitor advances in techniques that may improve our ability to measure these and other contaminants at even lower levels.

On April 10, 2024, the EPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS that are among the 29 PFAS being monitored in UCMR 5. The agency has updated the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> and UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder> to reflect this. PWSs will be required to comply with the PFAS NPDWR <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas> Maximum Contaminant Levels (MCLs) starting in April 2029; therefore, **UCMR 5 results for the regulated PFAS do not indicate compliance or noncompliance with the MCLs**. Information provided on this page for UCMR 5 results is for technical assistance only and does not supersede the PFAS NPDWR requirements in 40 CFR 141 and 40 CFR 142. The agency continues to advance the science on the potential health effects of a wide range of PFAS, including many of those monitored for under this program.

Through the Bipartisan Infrastructure Law <https://epa.gov/infrastructure/water-infrastructure-investments> (BIL), the EPA is helping states, Tribes, and especially small, rural, and disadvantaged 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. Along with the final PFAS NPDWR, the EPA announced nearly $1 billion in newly available funding through the Emerging Contaminants in Small or Disadvantaged Communities Grant Program <https://epa.gov/dwcapacity/emerging-contaminants-ec-small-or-disadvantaged-communities-grant-sdc> to help states and territories implement PFAS testing and treatment at PWSs. Additionally, the EPA has free Water Technical Assistance Programs <https://epa.gov/water-infrastructure/water-technical-assistance-programs> to help communities access federal resources by working directly with PWSs to identify challenges like PFAS; develop plans; build technical, managerial, and financial capacity; and apply for water infrastructure funding <https://epa.gov/infrastructure/water-infrastructure-investments>.

Answers to common questions on accessing and understanding the UCMR 5 data, and on PFAS and lithium in drinking water, are provided below. Before conducting your own assessment of the data, please review the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>.

Accessing and Understanding the UCMR 5 Data

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8. What is the difference between the EPA's drinking water regulation for PFOA, PFOS, PFHxS, GenX Chemicals, PFNA, and PFBS and the 2022 EPA Health Advisories for PFOA, PFOS, PFBS, and GenX Chemicals?
9. Are PWSs with UCMR 5 results above an MCL(s) for the final PFAS National Primary Drinking Water Regulation (NPDWR) out of compliance?
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11. How are UCMR 5 results for unregulated contaminants compared to available health-based reference concentrations in the EPA's Data Finder and Data Summary?
12. What should I consider before downloading the detailed UCMR 5 results?
13. How do I import the UCMR 5 data text files into Excel?
14. I don't see UCMR 5 results for a particular PWS. Where are they?
15. How does the EPA ensure that the UCMR laboratory data are accurate?
16. What visualization tools are available to view PFAS occurrence data?

1. **Where can I access UCMR 5 results?**

   The UCMR 5 analytical results are publicly available through the UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder>, the UCMR Occurrence Data webpage <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule> (via text files), and the PFAS Analytic Tools <https://echo.epa.gov/trends/pfas-tools>. The UCMR 5 Data Finder allows people to easily search for, summarize, and download the available UCMR 5 analytical results. Results can be filtered using multiple data fields, including public water system (PWS), PWS size, state, contaminant, source water type, results at or above UCMR minimum reporting levels (MRLs), and results above health-based reference concentrations. For those interested in large-scale data processing using statistical or data analysis software, the text files containing the UCMR 5 analytical results, as well as additional data element and ZIP Code information reported by participating PWSs, are recommended. Additionally, the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> summarizes the UCMR 5 results to date at the national level, available contaminant health effects information, and data considerations and definitions for the UCMR 5 Data Finder and text files. Monitoring results will be updated in the UCMR 5 Data Finder, Data Summary, and text files on a quarterly basis until completion of data reporting in 2026. A document with instructions and tips for accessing results and a video demonstration of the UCMR 5 Data Finder are available on the UCMR Occurrence Data webpage <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule>.

   UCMR 5 data are also included in the EPA's PFAS Analytic Tools <https://echo.epa.gov/trends/pfas-tools> and are updated soon after each public release of the data.

   Real-time UCMR results are stored in the EPA's web-based Safe Drinking Water Accession and Review System (SDWARS) prior to public release. Representatives of PWSs participating in UCMR 5 must register for a CDX/SDWARS <https://cdx.epa.gov/> account to receive automated notices when their results are ready to view in SDWARS. The EPA also encourages states to register for a CDX/SDWARS account for timely access to results. Please refer to the UCMR 5 Reporting Requirements webpage <https://epa.gov/dwucmr/reporting-requirements-fifth-unregulated-contaminant-monitoring-rule-ucmr-5> to access SDWARS walkthrough videos for PWS and state users.

2. **Where can I find a summary of health information about UCMR 5 contaminants?**

   The UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> identifies previously published information and publicly available EPA resources that provide context around UCMR 5 results in relation to their minimum reporting levels (MRLs), regulatory levels (if applicable), and available non-regulatory health-based reference concentrations. Within the Data Summary, the applicable regulatory levels for PFAS (*i.e.*, maximum contaminant levels [MCLs]) and the reference concentration for lithium (*i.e.*, health reference level [HRL]) are provided in the same units as UCMR 5 results (µg/L); underlying final toxicity assessment values (*e.g.*, EPA Integrated Risk Information System [IRIS]) are provided in mg/kg-day. The Data Summary will be updated on a quarterly basis until completion of data reporting in 2026.

3. **Are public water systems (PWSs) required to report their UCMR 5 results to their customers?**

   PWSs are required to notify <https://epa.gov/dwreginfo/public-notification-rule> customers through Tier 3 Public Notification (PN) about the availability of all UCMR results no later than 12 months after they are known by the PWS. Community water systems (CWSs) are also required to report UCMR results in their annual Consumer Confidence Report (CCR) <https://epa.gov/ccr> when contaminants are found (*i.e.*, measured at or above minimum reporting levels [MRLs]). CWSs must report the average and range of the prior year's monitoring results. If timing and delivery requirements are met, CWSs may include their PN within their CCR, also known as an annual drinking water quality report, which is to be delivered to all billing customers each year by July 1. EPA resources for PWSs are available on the CCR <https://epa.gov/ccr/how-water-systems-comply-ccr-requirements> and PN <https://epa.gov/dwreginfo/public-notification-rule-compliance-help-water-system-owners-and-operators> Compliance Help webpages. CCR and PN requirements need to be met for all UCMR 5 results (including results for the six UCMR 5 PFAS that are now subject to the NPDWR) and are separate from the PFAS NPDWR CCR and PN requirements. For the PFAS NPDWR, PN requirements for monitoring and testing procedure violations and CCR requirements become effective starting in April 2027; PN requirements for MCL violations become effective starting in April 2029.

4. **What concentration units are UCMR 5 analytical results reported in?**

   Analytical results from the UCMR program are reported by laboratories and provided by the EPA in micrograms/liter (µg/L, or parts per billion). To convert results in µg/L to nanograms/liter (ng/L, or parts per trillion), multiply the value by 1,000.

5. **What is a minimum reporting level (MRL) for the UCMR program?**

   The EPA established minimum reporting levels (MRLs) for lithium and the 29 PFAS included in UCMR 5. Only analytical results at or above the UCMR 5 MRL are reported to the EPA. The EPA establishes MRLs to ensure consistency in the quality of the information reported to the agency. UCMR MRLs are determined using data from multiple laboratories that participate in EPA's UCMR MRL-setting studies and are not associated with contaminant health effects information. The UCMR MRL is the lowest measurable concentration of a contaminant that, with 95% confidence, is achievable by at least 75% of laboratories nationwide using a specified analytical method (recognizing that individual laboratories may be able to measure or quantify analytes at lower levels). The EPA's MRLs for the 29 PFAS included in UCMR 5 range from 0.002 to 0.02 µg/L (parts per billion), which is equivalent to 2 to 20 ng/L (parts per trillion). The practical quantitation levels (PQLs) for the regulated PFAS are based on the UCMR 5 MRLs; both represent quantitation levels. For more information about the PQLs, refer to the Federal Register Notice for the final PFAS NPDWR <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas#regs>. The EPA's MRL for lithium is 9 µg/L (parts per billion). For more information, please refer to the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>.

6. **What is a health-based reference concentration for the UCMR program?**

   The EPA provides a health-based reference concentration for contaminants in drinking water if available from current health and toxicological information. Reference concentrations (*e.g.*, EPA health reference level [HRL], USGS health-based screening level [HBSL]) are for comparison and are taken from available health assessments published by the EPA or other governmental agencies. They are not legally enforceable federal standards and are subject to change as new health assessments are completed. For more information, please refer to the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>. The agency continues to assess the literature 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.

7. **What is the difference between the minimum reporting level (MRLs), health-based reference concentrations, and maximum contaminant levels (MCLs) used in the EPA's UCMR 5 Data Finder and Data Summary?**

   The UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> provides context around UCMR 5 results in relation to UCMR MRLs, which are based on laboratory analytical measurement capability, not associated with contaminant health effects information, and are the lowest concentrations that laboratories may report to the EPA during UCMR 5 monitoring. The Data Summary also provides information on health-based reference concentrations, which are non-regulatory, not legally enforceable drinking water concentrations from publicly available health effects information. In April 2024, the EPA finalized MCLs for certain PFAS for which UCMR 5 monitoring data are being collected. MCLs are legally enforceable standards for the highest level of a contaminant that is allowed in drinking water.

8. **What is the difference between the EPA's drinking water regulation for PFOA, PFOS, PFHxS, GenX Chemicals, PFNA, and PFBS and the 2022 EPA Health Advisories for PFOA, PFOS, PFBS, and GenX Chemicals?**

   The final regulation includes MCLs which are legally enforceable regulatory drinking water standards. The EPA establishes MCLs as close as feasible to the health-based, non-enforceable maximum contaminant level goal (MCLG), taking into consideration the ability to measure and treat to remove a contaminant, as well as the costs and benefits. Drinking water health advisories are developed under a separate authority and are different from MCLs and MCLGs. Each serves a different purpose. Health advisories are informational, non-regulatory, and not legally enforceable. Health advisories reflect the EPA's assessment of health risks of a contaminant based on the best available science and provide advice and information on actions that PWSs may take to address contamination for these and other PFAS. For more information, please refer to the EPA's drinking water health advisories <https://epa.gov/sdwa/drinking-water-health-advisories-has>.

9. **Are PWSs with UCMR 5 results above an MCL(s) for the final PFAS National Primary Drinking Water Regulation (NPDWR) out of compliance?**

   No. PWSs will be required to comply with the PFAS NPDWR MCLs starting in April 2029; therefore, UCMR 5 results for the regulated PFAS do not indicate compliance or noncompliance with the MCLs. PWSs may work with their state to submit their UCMR 5 monitoring data to meet some or all of the PFAS NPDWR's initial monitoring requirements, which must be completed by April 2027. Starting in 2029, compliance with the PFAS NPDWR MCLs will be determined by calculating the running annual average (RAA) of quarterly results for each sample point, based on compliance monitoring data reported to the primacy agency. For more information, please refer to the PFAS NPDWR website <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>.

10. **How are UCMR 5 results for the regulated PFAS compared to the NPDWR MCLs in the EPA's Data Finder and Data Summary?**

    Starting in April 2029, compliance with the PFAS regulatory MCLs will be determined by calculating the running annual average (RAA) of quarterly results for each sample point. Recognizing that the UCMR 5 results have no direct implications for PWS MCL compliance, but that many are interested in comparing UCMR 5 data to the MCLs, the EPA calculated annual averages for the UCMR 5 results where such a calculation was possible. The agency then compared those averages to the NPDWR MCLs. Please note: the UCMR 5 averages for sampling locations with ground water sources are based on two results, not four.

    The UCMR 5 Data Finder and Data Summary each provide a table with the number of averages and PWSs with averages to date that are greater than the MCLs for regulated PFAS. For UCMR 5 monitoring, PWSs may have multiple sampling locations, for which there are either two or four sample events over a period of 12 months (for locations with ground water or surface water sources, respectively). Sampling locations were only considered in the comparison to each MCL if they had a corresponding full set of UCMR 5 results (*i.e.*, two or four results).

    The MCLs for PFOA and PFOS are expressed with two significant digits; MCLs for HFPO-DA, PFHxS, PFNA, and the HI are expressed with one significant digit. Comparison of UCMR 5 averages to MCLs is based on the corresponding number of significant digits. For example, averages $\geq$0.00405 µg/L for PFOS or PFOA, and $\geq$0.015 µg/L for HFPO-DA, PFHxS, or PFNA, round to 0.0041 µg/L and 0.02 µg/L, respectively, and are identified as above the MCLs. Similarly, averages $\geq$1.5 for the Hazard Index (HI) round to 2 are identified as above the MCL if at least two of the four PFAS included in the HI are measured at or above the UCMR MRL. For more information, please refer to the EPA's PFAS NPDWR website.

11. **How are UCMR 5 results for unregulated contaminants compared to available health-based reference concentrations in the EPA's Data Finder and Data Summary?**

    The UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder> allows people to specifically search for analytical results greater than available health-based reference concentrations for unregulated UCMR 5 contaminants (e.g., EPA health reference level [HRL] for lithium, USGS health-based screening levels [HBSLs] for PFBA and PFHxA). Additionally, Table 3 in the UCMR 5 Data Summary provides the number of sample results and PWSs with results to date that are greater than the available health-based reference concentrations. Reference concentrations are expressed with one significant digit; comparison of UCMR 5 results to these levels is therefore based on one significant digit. For example, results ≥15 µg/L for lithium round to 20 µg/L; results ≥6.5 µg/L for PFBA round to 7 µg/L; and results ≥3.5 µg/L for PFHxA round to 4 µg/L and are identified as above the health-based reference concentrations. For more information, please refer to the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>.

12. **What should I consider before downloading the detailed UCMR 5 results**

    There are multiple options for viewing the UCMR 5 results. The UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder> allows people to quickly search for and summarize available UCMR 5 results by multiple data fields, including PWS, name or ID, PWS size, state, EPA Region, contaminant, source water type, results at or above UCMR minimum reporting levels (MRLs), and results above health-based reference concentrations. This tool can be used by federal, state, and local agencies as well as others to easily locate and retrieve specific results and assist with answering questions regarding UCMR 5 monitoring. Selected results can be viewed online or downloaded as an Excel file (.xlsx).

    Monitoring results are also provided in tab delimited occurrence data text files (.txt) <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#5>. The data in these text files can be imported into various data analysis and software programs. The text files have field names in the first row and no text qualifier. The EPA recommends importing all ID fields into your choice of software as text since some of the IDs can otherwise be misinterpreted as long integer field types when they contain alpha characters. A null value (or blank) in the "AnalyticalResultValue" field of the text files indicates the result was less than the UCMR minimum reporting level (MRL). The "AnalyticalResultSign" field also indicates whether the analytical result is less than (<) the UCMR MRL or equal to (=) a numeric value at or above the UCMR MRL, which would be reported under "AnalyticalResultValue."

    Results at or above the UCMR MRL are provided in micrograms per liter (µg/L, or parts per billion). Each record represents a single analytical result measure for one contaminant in drinking water for one sampling point and sampling event from a PWS. Data may be added, removed, or updated over the course of the reporting cycle following further review by analytical laboratories, PWSs, states, and the EPA. After reporting UCMR 5 monitoring results, water providers may take action to reduce contaminant levels in finished drinking water.

    Detailed instructions for accessing results and a video demonstration of the UCMR 5 Data Finder are available on the UCMR Occurrence Data webpage <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#5>. Additional data considerations and data definitions are provided in the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>. If you are looking for results from past UCMR monitoring (UCMR 1-4), you can find them using the UCMR Archival Data Finder <https://epa.gov/dwucmr/archival-data-finder-unregulated-contaminant-monitoring-rule-ucmr-1-4>.

13. **How do I import the UCMR 5 data text files into Excel?**

    Please refer to the document “Instructions for Accessing UCMR Results <https://epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule>”. Specific UCMR 5 analytical results can also be searched for and downloaded as an Excel file (.xlsx) using the UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder>.

14. **I don’t see UCMR 5 results for a particular PWS. Where are they?**

    If you cannot find results for a public water system (PWS):

    - The PWS may serve less than 3,300 individuals and was not selected for UCMR 5 monitoring as part of the nationally representative random sample of 800 PWSs serving that size group.
    - The monitoring for a PWS may not have occurred yet. PWSs monitor during a single 12-month timeframe in the three years of monitoring (2023–2025).
    - The monitoring results for a PWS may not have been reported yet. Laboratories supporting UCMR 5 are obligated to report their data to SDWARS within 90 days of sample collection. The PWS then has up to 30 days to review the data.
    - A resample may be in process due to laboratory or PWS sampling errors.
    - The PWS may be a transient non-community water system (TNCWS). UCMR 5 requirements apply to community water systems (CWSs) and non-transient non-community water systems (NTNCWSs).
    - In the UCMR 5 Data Finder <https://epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder>, “<MRL” in the “Result” field indicates the result was less than the UCMR minimum reporting level (MRL). Only analytical results at or above the UCMR 5 MRL are reported to the EPA.
    - In the text files, a null value (or blank) in the “AnalyticalResultValue” field indicates the result was less than the UCMR MRL. The “AnalyticalResultSign” field also indicates whether the analytical result is less than (<) the UCMR MRL or equal to (=) a numeric value at or above the UCMR MRL, which would be reported under “AnalyticalResultValue.” See the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> for more information.

15. **How does the EPA ensure that the UCMR laboratory data are accurate?**

    Only laboratories that were approved for UCMR 5 participation through EPA's Laboratory Approval Program <https://epa.gov/dwucmr/laboratory-approval-program-unregulated-contaminant-monitoring-rule-ucmr-5>, which includes laboratory Proficiency Testing, can analyze samples for the UCMR program. In addition, when a laboratory enters results into the data reporting system (SDWARS 5) on behalf of the PWS, they must also enter all associated method quality control (QC) data that apply to the sample results. All data fields in SDWARS 5 have built-in QC checks to ensure all data uploaded by approved laboratories meet the analytical method and UCMR reporting guidelines.

16. **What visualization tools are available to view PFAS occurrence data?**

    The publicly available PFAS Analytic Tools <https://echo.epa.gov/trends/pfas-tools> on EPA's Enforcement and Compliance History Online (ECHO) webpage are integrated data visualizations that can be used to evaluate what is known about PFAS manufacture, release, and occurrence in communities. EPA's PFAS Analytic Tools integrate data from many sources including UCMR 3 monitoring for six PFAS and UCMR 5 monitoring for 29 PFAS; UCMR 5 data will be updated soon after each public release of the data.

PFAS in Drinking Water

17. Where can I find more information about PFAS in drinking water?
18. Why is the EPA collecting data on PFAS for which there isn't health effects information?
19. What is the EPA doing to improve our understanding of PFAS without health effects information? Will the agency have more health effects information (*i.e.*, toxicity values) available by the time UCMR 5 monitoring is complete?
20. What treatment options are most effective in removing PFAS from drinking water?

17. **Where can I find more information about PFAS in drinking water?**

- EPA PFAS Explainers:
  - English: https://www.epa.gov/pfas <https://epa.gov/pfas>
  - Spanish: https://espanol.epa.gov/espanol/informacion-basica-sobre-pfas <https://espanol.epa.gov/espanol/informacion-basica-sobre-pfas>
- EPA PFAS National Primary Drinking Water Regulation (NPDWR) and Supporting Materials <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas> (https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas)
  - General Information <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas#general>
  - Communications Toolkit <https://epa.gov/sdwa/pfas-communications-toolkit>
  - Information for States, Tribes, and Water Systems <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas#technical>
- Frequently Asked Questions and Answers: Final PFAS National Primary Drinking Water Regulation (pdf) <https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_qa_general_4.9.24v1.pdf> (218.97 KB)
  - What should I do if I am concerned about PFAS in my drinking water?
  - Can I drink my water?
  - Should I stop breastfeeding my infant
  - Does bathing/showering with my tap water present a health risk?
  - Can I boil PFAS out of my water?
  - Should I drink bottled water?
  - How much of my exposure to PFAS is through drinking water?
  - Should I use a filter to reduce levels of PFAS in my water?
  - What does a part per trillion look like? How much is that?

18. **Why is the EPA collecting data on PFAS for which there isn't health effects information?**

The Safe Drinking Water Act was amended by Section 7311 of the Fiscal Year 2020 National Defense Authorization Act (NDAA) to require that the EPA include all PFAS in UCMR 5 for which a drinking water method has been validated, and that are not subject to a National Primary Drinking Water Regulation (NPDWR). Therefore, UCMR 5 includes all 29 PFAS that are within the scope of EPA Methods 533 and 537.1.

19. **What is the EPA doing to improve our understanding of PFAS without health effects information? Will the agency have more health effects information (*i.e.*, toxicity values) available by the time UCMR 5 monitoring is complete?**

    The EPA continues to assess the literature for health effects information, identify data gaps, and determine the need for future research to improve our understanding of the possible health risks associated with these contaminants in public drinking water. The UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule> will be updated as the agency completes health assessments on PFAS, such as through the Integrated Risk Information System (IRIS). Understanding where PFAS are present in drinking water, and at what levels, is also critical to taking steps to address these chemicals. Additionally, due to their widespread use and persistence, many PFAS are known to co-occur in drinking water and the environment—meaning that these compounds are often found together and in different combinations as mixtures. The agency's evaluation of the best-available science indicates that mixtures of PFAS can pose a health risk greater than each chemical on its own. The data provided by UCMR 5 monitoring for 29 PFAS will help increase the EPA's understanding of PFAS occurrence and co-occurrence in drinking water and help inform and prioritize research needs on the health effects of PFAS from drinking water. The EPA is continuing to develop and validate methods to detect and measure PFAS in the environment, including additional targeted methods for detecting and measuring specific PFAS, non-targeted methods for identifying unknown PFAS in the environment, and exploring "total PFAS" methods. Additionally, the EPA's Office of Research and Development (ORD) is seeking input from science advisers on a new model to assess the toxicity of chemicals with little to no existing data, known as a transcriptomic method <https://epa.gov/etap>.

20. **What treatment options are most effective in removing PFAS from drinking water?**

    As part of the final PFAS National Primary Drinking Water Regulation (NPDWR), granular activated carbon, anion exchange, reverse osmosis, and nanofiltration were identified by the EPA as the "Best Available Technologies" (BATs) for meeting the PFAS maximum contaminant levels (MCLs). This is based on six criteria: removal efficiency, historical full-scale operation, geographic applicability, compatibility with other treatment processes, ability to bring the entire PWS into compliance, and a reasonable cost to large as well as medium sized PWSs. PWSs may use any technology or practice to meet the PFAS MCLs and are not limited to the BATs. PWSs may also choose to change their source water or close PFAS contaminated source waters to achieve compliance. For EPA resources related to drinking water treatment and compliance with the PFAS MCLs, see the EPA's PFAS NPDWR website <https://epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>.

Lithium in Drinking Water

21. What are the environmental sources and uses of lithium?
22. Why is lithium included in UCMR 5 and what information is available?
23. How can lithium be removed from drinking water?

21. **What are the environmental sources and uses of lithium?**

    Lithium is a naturally occurring metal in Earth's crust. Lithium may be found at higher concentrations in certain parts of the country, particularly in groundwater sources in arid locations in the Western U.S. Lithium has numerous commercial uses including as a pharmaceutical drug, an industrial chemical catalyst, a sanitizing agent for swimming pools and hot tubs, and increasingly as a component of batteries. Lithium is likely present in a variety of foods (such as cereal grains, leafy vegetables, and root crops), but it is not clear which foods may be significant sources of dietary lithium. There is currently no U.S. recommended dietary allowance for lithium.

22. **Why is lithium included in UCMR 5 and what information is available?**

Lithium is on the EPA's Fifth Contaminant Candidate List (CCL 5) <https://epa.gov/ccl/contaminant-candidate-list-5-ccl-5>, a list of contaminants that are currently not subject to any proposed or promulgated National Primary Drinking Water Regulations (NPDWRs) but are known or anticipated to occur in public water systems (PWSs). Contaminants listed on the CCL may require future regulation under the Safe Drinking Water Act (SDWA). The EPA uses the CCL to identify priority contaminants for regulatory decision making and information collection needs. Lithium was selected for UCMR 5 through a contaminant prioritization process that considered expected or known occurrence in drinking water and the availability of health effects information. The UCMR 5 monitoring data for lithium will better inform research and determine whether the contaminant poses health risks to people through drinking water from PWSs. To learn more about the prioritization of lithium for UCMR 5, refer to the Information Compendium for Contaminants <https://www.regulations.gov/document/epa-hq-ow-2020-0530-0126>.

The EPA does not currently have a health advisory for lithium in drinking water. However, the CCL program derived a health reference level (HRL) for screening purposes based on the EPA's provisional peer-reviewed toxicity value (PPRTV) assessment for lithium. HRLs are not final determinations about the level of a contaminant in drinking water that is necessary to protect any particular population. The HRL for lithium is based on adverse effects observed in patients administered lithium therapeutically. Lithium has been used in pharmaceuticals for decades to treat certain medical conditions. Despite the abundance of information on patients receiving lithium at therapeutic levels, there has historically been limited information available to evaluate health risks in people at the levels associated with typical drinking water consumption. This is one of the reasons the EPA is choosing to monitor for the presence and levels of lithium in drinking water systems around the country. The science on lithium's effects on human health, and at what levels, is still evolving.

The EPA has developed a Technical Fact Sheet: Lithium in Drinking Water (pdf) <https://www.epa.gov/system/files/documents/2023-11/ucmr5-technical-fact-sheet-lithium-in-drinking-water.pdf> (270.84 KB) to help primacy agencies interpret the UCMR 5 monitoring results, understand health risks based on available information, and respond to public inquiries. For more information, please refer to the EPA's provisional peer-reviewed toxicity value (PPRTV) assessment for lithium, the CCL 5 supporting materials <https://epa.gov/system/files/documents/2022-10/technical%20support%20document%20for%20the%20final%20ccl%205%20-%20contaminant%20information%20sheets.pdf>, and the UCMR 5 Data Summary <https://epa.gov/dwucmr/data-summary-fifth-unregulated-contaminant-monitoring-rule>. The agency continues to review treatment literature and publish details regarding the removal efficiencies for various technology types via its Drinking Water Treatability Database.

23. **How can lithium be removed from drinking water?**

    Lithium cannot be removed by heating, boiling, or disinfecting water. Certain drinking water treatments can reduce lithium in drinking water. Available literature, based largely on bench- and pilot-scale research, suggests that ion exchange is effective for removing lithium from drinking water. Adsorption with novel media can also be effective. The EPA continues to review treatment literature and publish details regarding the removal efficiencies for various technology types via its Drinking Water Treatability Database.

    The U.S. Food and Drug Administration (FDA) has not established a standard for lithium in bottled water. The FDA bottled water resources are available on the Bottled Water Everywhere: Keeping it Safe <https://www.fda.gov/consumers/consumer-updates/bottled-water-everywhere-keeping-it-safe> webpage.

UCMR 5 Scope, Analytical Methods, and Contaminants

Assessment Monitoring (AM)

Public water systems (PWSs) subject to UCMR 5 monitoring include:

- All community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) serving more than 10,000 people
- All CWSs and NTNCWSs serving 3,300 to 10,000 people
- A representative sample of 800 CWSs or NTNCWSs serving fewer than 3,300 people
    - PWS Types <https://epa.gov/dwreginfo/information-about-public-water-systems>

PWSs will monitor for 29 per- and polyfluoroalkyl substances (PFAS) and lithium, during a 12-month period from January 2023 through December 2025. The EPA continues to be responsible for all analytical costs associated with monitoring at PWSs serving 10,000 or fewer people. See table below for the monitoring design.

Table 1. Monitoring Design

PWS Size (# of people served)	PWS Participation in Monitoring for 30 Contaminants
Small PWSs (fewer than 3,300)	800 randomly selected surface water (SW), ground water under the direct influence of surface water (GWUDI), mixed sources (MX), and ground water (GW) PWSs
Small PWSs (3,300 – 10,000)	All SW, GWUDI, MX, and GW PWSs
Large PWSs (10,001 and over)	All SW, GWUDI, MX, and GW PWSs

SDWA was amended by Section 7311 of the National Defense Authorization Act (NDAA) for Fiscal Year 2020. NDAA specifies that the EPA shall include all PFAS in UCMR 5 for which a drinking water method has been validated, and that are not subject to a National Primary Drinking Water Regulation. In addition to lithium, UCMR 5 includes all 29 PFAS that are within the scope of EPA Methods 533 and 537.1; see Table 2.

Table 2. Contaminants, Minimum Reporting Levels, Sampling Locations, and Analytical Methods

Contaminant	CASRN[1]	Minimum Reporting Level[2]	Sample Point Location[3]	Analytical Methods[4]	Contaminant Classification
lithium	7439-93-2	9 µg/L	EP	EPA Method 200.7; SM 3120 B (2017); SM 3120 B-99 (1999); ASTM D1976-20	Metal; pharmaceutical

Contaminant	CASRN[1]	Minimum Reporting Level[2]	Sample Point Location[3]	Analytical Methods[4]	Contaminant Classification
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	0.005 µg/L	EP	EPA 533	PFAS
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	0.002 µg/L	EP	EPA 533	PFAS
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	0.003 µg/L	EP	EPA 533	PFAS
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX chemicals)	13252-13-6	0.005 µg/L	EP	EPA 533	PFAS
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	0.02 µg/L	EP	EPA 533	PFAS
perfluorobutanoic acid (PFBA)	375-22-4	0.005 µg/L	EP	EPA 533	PFAS
perfluorobutanesulfonic acid (PFBS)	375-73-5	0.003 µg/L	EP	EPA 533	PFAS
1H,1H, 2H, 2H-perfluorodecane sulfonic acid (8:2FTS)	39108-34-4	0.005 µg/L	EP	EPA 533	PFAS
perfluorodecanoic acid (PFDA)	335-76-2	0.003 µg/L	EP	EPA 533	PFAS
perfluorododecanoic acid (PFDoA)	307-55-1	0.003 µg/L	EP	EPA 533	PFAS
perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	0.003 µg/L	EP	EPA 533	PFAS
perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.003 µg/L	EP	EPA 533	PFAS

Contaminant	CASRN[1]	Minimum Reporting Level[2]	Sample Point Location[3]	Analytical Methods[4]	Contaminant Classification
perfluoroheptanoic acid (PFHpA)	375-85-9	0.003 µg/L	EP	EPA 533	PFAS
1H,1H, 2H, 2H-perfluorohexane sulfonic acid (4:2FTS)	757124-72-4	0.003 µg/L	EP	EPA 533	PFAS
perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.003 µg/L	EP	EPA 533	PFAS
perfluorohexanoic acid (PFHxA)	307-24-4	0.003 µg/L	EP	EPA 533	PFAS
perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	0.004 µg/L	EP	EPA 533	PFAS
perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	0.003 µg/L	EP	EPA 533	PFAS
perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	EP	EPA 533	PFAS
1H,1H, 2H, 2H-perfluorooctane sulfonic acid (6:2FTS)	27619-97-2	0.005 µg/L	EP	EPA 533	PFAS
perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.004 µg/L	EP	EPA 533	PFAS
perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	EP	EPA 533	PFAS
perfluoropentanoic acid (PFPeA)	2706-90-3	0.003 µg/L	EP	EPA 533	PFAS
perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.004 µg/L	EP	EPA 533	PFAS
perfluoroundecanoic acid (PFUnA)	2058-94-8	0.002 µg/L	EP	EPA 533	PFAS

Contaminant	CASRN[1]	Minimum Reporting Level[2]	Sample Point Location[3]	Analytical Methods[4]	Contaminant Classification
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.005 µg/L	EP	EPA 537.1	PFAS
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.006 µg/L	EP	EPA 537.1	PFAS
perfluorotetradecanoic acid (PFTA)	376-06-7	0.008 µg/L	EP	EPA 537.1	PFAS
perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.007 µg/L	EP	EPA 537.1	PFAS

Notes

1. Chemical Abstracts Service Registry Number (CASRN)
2. The EPA-established UCMR Minimum Reporting Level (MRL) is the lowest concentration that laboratories may report to the EPA during UCMR monitoring. UCMR MRLs are determined using data from multiple laboratories that participate in the EPA's MRL-setting studies and are not associated with contaminant 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).
3. Sample Point Location - Entry point to the distribution system (EP)
4. EPA Analytical Methods
    a. EPA Method 533 <https://epa.gov/dwanalyticalmethods/method-533-determination-and-polyfluoroalkyl-substances-drinking-water-isotope>
    b. EPA Method 537.1
    c. EPA Method 200.7 <https://epa.gov/esam/method-2007-determination-metals-and-trace-elements-water-and-wastes-inductively-coupled>

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